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Romana KOREZ VIDE

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Strengthening Resilience by Sustainable Economy and Business – Towards the SDGs

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7TH FEB INTERNATIONAL SCIENTIFIC CONFERENCE
STRENGTHENING RESILIENCE BY SUSTAINABLE ECONOMY AND BUSINESS – TOWARDS THE SDGS.
Z. Nedelko, R. Korez Vide (eds.)

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KEYNOTE SPEECHES

INNOVATIVE ENTREPRENEURSHIP FOR SUSTAINABLE DEVELOPMENT

TIIT ELENURM
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Abstract The aim of this presentation is to highlight sustainable development challenges and opportunities for innovative entrepreneurs and investors interested in start-ups that have green agendas. One perspective in the sustainable development discourse is focused on reversing the globalization trend and developing the self-sufficiency of local communities. Innovative start-up logic is however focused on scalable business models and digital tools for engaging entrepreneurs and customers in different countries to save and recycle resources. Global campaigns such as World Cleanup Day can inspire innovative entrepreneurs in different regions. Even initiatives from small countries can build bridges between communities at a global scale, including all levels of society – from citizens to business and government institutions. Sustainable development goals assume matching values of organizations and young people eager to contribute to innovation. Sustainability motivation is based on the synergy between competence, autonomy, and relatedness of all stakeholders. Calls to limit consumption are not enough to create sustainable motivation. The success of creative start-up entrepreneurship assumes aligning the vision to contribute to the sustainable development path of the World and the change management process that makes a start-up business itself more sustainable. Regeneration of ecological systems in a socially sustainable way is a crucial challenge for innovators that have to overcome the "not in my backyard" mentality. Agility has to be balanced with long-term potential problem analysis. International networking contributes to knowledge sharing and financial sustainability.

Keywords:
sustainability, innovation, start-up, innovation, entrepreneurship

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BORN SUSTAINABLE: PROMOTED BY THE ECOSYSTEM FOR SUSTAINABLE ENTREPRENEURSHIP

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Abstract The institutions and resource endowments for entrepreneurial engagement with sustainability in a country are forming a 'national ecosystem for sustainable entrepreneurship.' The ecosystem for sustainable entrepreneurship is a context for businesses pursuing sustainability. Little is known, however, about the effect of the system on business pursuits of sustainability. We explored whether the ecosystem promotes businesses that are born sustainable in that they, from their start, are pursuing strategies and practices for sustainability. The national ecosystems for sustainable entrepreneurship in 47 countries, with a large representative sample of starting and operating businesses, were surveyed in 2021 by the Global Entrepreneurship Monitor. Hypotheses about the effect of an ecosystem on business engagement with sustainability were tested by hierarchical linear modeling. Elaboration of national ecosystems for sustainable entrepreneurship is found to promote sustainability pursuits in newborn businesses more than in older businesses. This finding contributes to evidence-based theorizing of the nexus between entrepreneurial ecosystems and business pursuits of sustainability.

Keywords:
entrepreneurship, startups, sustainability, ecosystem, national, global

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GLOBAL SOUTH PERSPECTIVE ON CIRCULAR ECONOMY – THE CASE OF INDIA

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Abstract Environment deterioration, waste management, and energy deficiency are inherent problems in India's linear model of industrialization. The drive to transform Indian carbon and waste burdens by 2030 is under implementation by the government of India. In one domain, i.e., waste management, India has progressed from 18% waste processing in 2014 to 70% in 2021. Household and agricultural waste is significant in size to India's organic waste and is experiencing a transformation from linear to circular biotreatment methods, producing compressed natural gas (CNG) and contributing to the energy and farming needs of the country. The change is an outcome of catalyst factors identified by multi-stakeholders in the ecosystem, which are demand, policy, and supply. Based on primary and secondary research, our research presents a catalyst framework to transform the linear model into a circular model in the bio-waste sector in rural and urban India.

Keywords:
Bio-CNG, catalyst, circular economy, India, sustainable development, waste management

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Q57, Q41

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PROCEEDINGS

Non-financial Reporting Practices in Hungary – Opportunities and Challenges in Preparation For CSRD

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Abstract Under the CSRD (Corporate Sustainability Reporting Directive), companies already covered by the NFRD (Non-Financial Reporting Directive) will have to report on sustainability issues from 2024, large companies not covered by the NFRD from 2025 and listed SMEs from 2026. As of 2018, Hungarian companies under NFRD were required to report non-financial data in their annual reports. In our research, we seek to answer the question of what domestic non-financial reporting practices will be able to be relied upon by preparers under CSRD. Companies preparing to report under the CSRD often use the NFRD reports which have been already prepared by those currently required to report as a benchmark, that is why we use the list of companies under NFRD as a sample. We identify which international reporting guidelines are followed and what are the most frequent topics in NFRD reports with content analysis. Among the sub-elements, the companies surveyed write most about the environment and social/employment issues in their annual reports, while fight against corruption and human rights are rarely mentioned. Based on our research, we highlight good practices that can be followed in terms of international guidelines and company examples.

Keywords: non-financial reporting, CSRD, NFRD, Hungary, SDG, GRI

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1 Introduction

Corporate sustainability issues as well as the communication and dialogue with stakeholders about them are getting more and more significant in every economy. In the European Union, Europe 2020 strategy and the related regulations mean important milestones in this process. From the perspective of our topic, non-financial reporting, Directive 2014/95/EU (Non-Financial Reporting Directive, NFRD, EP and EC, 2014) is of high interest, which introduced reporting obligations for the largest European companies to promote their responsible and long-term sustainable operation. NFRD complements two European Accounting Directives (78/660/EEC and 83/349/EEC, EC 1978 and 1983) and is based on more international benchmarks, like IFRS, GRI or ISO 26000 (Kardos and Madarasi-Szirmai, 2022). It has made companies' operations more transparent, identified the sustainability risks affecting their operations, and increased investor and consumer confidence. From 2018, NFRD made reporting of non-financial information mandatory for all companies with assets of more than €20 million or net sales of more than €40 million and more than 500 employees. In Hungary, under Chapter III, Section 95/C of the Act C of 2000 on Accounting (Government of Hungary, 2000), as of 2018, organizations as defined by the NFRD were required to report non-financial information in their annual reports, including: environmental protection; social and employment issues; respect for human rights; anti-corruption and bribery.

Already when the NFRD was drafted, the EU expressed its intention to extend sustainability reporting obligations for an increasingly wide range of companies. In addition, experience has shown that the quality of the data published varied widely, based on the relatively permissive regulation, which only described the issues, contrary to the principles of known reporting guidelines (mainly Global Reporting Initiative, GRI) and the legislator's aim to publish comparable, reliable information that would influence stakeholders' decisions and companies' sustainability performance.

In this paper, after the overview of the newest non-financial reporting regulation of EU and its connection to the most significant sustainability reporting scheme, GRI, we seek answers for the following research questions:

1. Which domestic non-financial reporting practices will be able to be used under CSRD (Corporate Sustainability Reporting Directive)?
2. Which international reporting guidelines are followed in Hungary and what are the most frequent topics in reports?
3. What are the main strengths of best practices?

In our analysis we only used Hungarian reports and good practice examples. In a further step of research, with broadening the scope to international cases we will be able to provide readers with a better understanding of how companies can overcome the challenges highlighted in the paper.

2 Theoretical Background

CSRD (Corporate Sustainability Reporting Directive, Directive 2022/2464/EU, EP and EC, 2022), adopted by the European Commission on 28 November 2022 changes the scope of companies covered by the NFRD (to all large companies from 2025 and to listed SMEs from 2026). Additionally, CSRD takes major steps towards the creation of a single European Sustainability Reporting Standard (ESRS) (EFRAG, 2022), which means that companies that were obliged by the NFRD as well, also will have to report on much more indicators from 2024.

The first version of the ESRS provides European companies with 4 sets of standards: horizontal (cross cutting), environmental, social and governance standards (ESG). The indicator groups will be structured in a similar way to the GRI Standards (GRI, 2022).

Going beyond indicators, perhaps an even more important part of international reporting standards is the definition of principles. In the context of the GRI 2022 revision, materiality and stakeholder engagement were highlighted as key principles, emphasizing that they are the key to the usefulness and meaning of the reporting process for both the company and its stakeholders. ESRS is also like the GRI in its principles (EFRAG, 2022):

- ESRG 1 Double materiality;
- ESRG 2 Characteristics of information quality;

- ESRG 3 Time horizons;
- ESRG 4 Boundaries and levels of reporting;
- ESRG 5 EU and international alignment;
- ESRG 6 Connectivity.

This allows for a parallel between the GRI and the proposed ESRS indicator structure. This recognition will allow European companies already using GRI to comply with the new standard from the beginning. The main points of possible alignment are shown in Table 1.

Table 1: Comparison and parallels of ESRS and GRI Standards

Indicators in GRI Standards	*Indicators in ESRS*
GRI 3 Material Topics	**ESRS 4 Sustainability material impacts, risks and opportunities**
GRI 3-1 Process to determine material topics GRI 3-2 List of material topics GRI 3-3 Management of material topics	
Environmental standards	
GRI 302 Energy	ESRS E1 Climate change
GRI 303 Water and Effluents	ESRS E3 Water & marine resources
GRI 304 Biodiversity	ESRS E4 Biodiversity & ecosystems
GRI 305 Emissions	ESRS E1 Climate change ESRS E2 Pollution
GRI 306 Effluents and Waste	ESRS E5 Circular economy
Other environmental standards	ESRS 3 Sustainability governance and organisation ESRS 5 Definitions for policies, targets, action plans and resources
Employment standards	
GRI 401 Employment	ESRS S1 Own workforce – general
GRI 403 Occupational Health and Safety	ESRS S2 Own workforce – working conditions
GRI 405 Diversity and Equal Opportunity	ESRS S3 Own workforce – equal opportunities
GRI 404 Training and Education	ESRS S4 Own workforce – other work-related rights
Social standards	
GRI 413 Local communities	ESRS S6 Affected communities
GRI 414 Supplier social assessment	ESRS S5 Workers in the value chain
GRI 416 Customer health and safety GRI 417 Marketing and labelling GRI 418 Customer privacy	ESRS S7 Consumers/End-users

Indicators in GRI Standards	*Indicators in ESRS*
Economic standards	
GRI 201 Economic Performance 2016 GRI 202 Market Presence GRI 203 Indirect Economic Impacts 2016	ESRS G1 Governance, risk management and internal control ESRS G2 Products and services, management and quality of relationships with business partners ESRS G3 Responsible business practices

Source: Authors' research based on EFRAG (2022) and GRI (2022).

3 Methodology

Already prepared NFRD reports can serve as a benchmark for companies that will have to report under the CSRD. That is why they can be a starting point for our research regarding the preparedness of Hungarian companies for the new EU regulation.

We seek to answer the question of what domestic non-financial reporting practices will be able to be used under CSRD. We identify which international reporting guidelines are followed in Hungary and what are the most frequent topics (SDGs; UN, 2015) in NFRD reports with content analysis. Based on our research, we highlight good practices that can be followed.

In our research, we used the sample of Hungarian companies under NFRD included in the research of Lippai-Makra (2022 (Table 2)). The author reported that the identification of companies was a complex process because there is not a central register of these firms. Our only review was that out of the 23 companies in her sample, 2 have been dissolved or merged, so 21 companies were examined further by us.

Our research relied mainly on company statements (integrated and consolidated reports) and we used content analysis by using the topics and related terms that are defined by the NFRD. In a second phase, we searched the downloaded reports for 3 keywords: SDG, ESG, GRI as we consider the using of these well-known international standards as good practice to integrate sustainability content at a strategic level within an organization and to make the relationship between financial and sustainability issues clearly visible.

Table 2: List of Hungarian companies that had to comply with the non-financial disclosure requirements under the NFRD in 2022

No.	Name	Website address	Length of Annual Report 2021 (pages)
1	Any PLC	https://www.any.hu/	69
2	Magyar Telekom PLC	https://www.telekom.hu/rolunk/befektetoknek/penzugyi_jelentesek	233
3	Masterplast PLC	https://www.masterplastgroup.com/document_folder/masterplast-konszolidalt-eves-jelentesek/	76
4	MOL PLC	https://molgroup.info/hu/befektetoi-kapcsolatok/jelentesek	112 +115
5	OPUS GLOBAL PLC	https://opusglobal.hu/befektetoknek/#608-610-ii-penzugyi-jelentesek-1641809116	215
6	Rába PLC	https://raba.hu/befektetoknek/	not issued in 2021
7	Richter Gedeon PLC	https://www.gedeonrichter.com/hu-hu/befektetok	310
8	Waberer's PLC	https://www.waberers.com/hu/befektetoknek	75
9	OTP Bank PLC	https://www.otpbank.hu/portal/hu/IR_Eves_jelentes	83
10	Takarék Jelzálogbank PLC	https://www.takarekjzb.hu/sw/static/file/takarekjzb.hu-files-22-87156.pdf	122
11	MKB Bank PLC	https://www.mkb.hu/befektetoknek/mkb-bankrol/penzugyi-jelentesek	168
12	Budapest H. és F. Bank PLC	From 31 March 2022, Hungarian National Bank approved the merger of MKB Bank and Budapest Bank. The merged bank operates under the name MKB Bank Plc.	not issued in 2021
13	CIB Bank PLC	https://www.cib.hu/document/documents/CIB/kommunikacio/evesjelentesek/IFRS_2021_CIB-Group__HU-220325.pdf	187
14	Citibank E. PLC	https://www.citibank.com/icg/sa/emea/hungary/assets/docs/annual-reports/2021_Annual_Report_of_Citibank_Europe_plc_HU.pdf	116
15	ERSTE BANK H. PLC	https://www.erstebank.hu/hu/ebh-nyito/bankunkrol/erste-bank-hungary-zrt/vallalatiranyitas/eves-jelentesek	not issued in 2021
16	K&H PLC	https://www.kh.hu/csoport/bank/eves-jelentesek	219

No.	Name	Website address	Length of Annual Report 2021 (pages)
17	Raiffeisen Bank PLC	https://www.raiffeisen.hu/raiffeisen-csoport/sajtoszoba/penzugyi-adatok/jelentesek	130
18	Sberbank Takarék Jelzálogbank PLC	The European resolution authority has opened winding-up proceedings against Sberbank Europe AG, the parent company of Sberbank Hungary. Hungarian National Bank has withdrawn the operating licence of Sberbank, citing a serious liquidity problem and a weak capital position of Sberbank Hungary. At the same time, Russia's Sberbank announced its complete withdrawal from the European market.	not issued in 2021
19	Unicredit Bank Hungary PLC	https://www.unicreditbank.hu/hu/rolunk/hasznos_informaciok/penzugyi_informaciok.html	109
20	AEGON Magyarország PLC	https://www.aegon.hu/eves-jelentes/eves-jelentes-2021.html	n.d. (html)
21	Allianz Hungária PLC	https://www.allianz.com/en/investor_relations/results-reports/annual-reports.html	208
22	Generali Biztosító PLC	https://www.generali.hu/Rolunk/miagenerali.aspx#Jelentesek	105
23	Groupama Biztosító PLC	https://www.groupama.hu/hu/rolunk.html?fenntarthatosag	119

Source: Authors' research based on Lippai-Makra (2022).

The first major difficulty of our research was the lack of a permanent place for annual reports on websites. Most often the reports are found under 'about us' and 'for investors' but often only in a 'downloads' or 'documents' submenu. The availability and page numbers of the reports are shown in Table 2. In three cases, we did not find the annual report on the website, either only a report in English on the parent company's website, or only some information, e.g. an executive summary. In total, 18 reports were downloaded and analyzed (signed with white in Table 2). Because of the small number of reports, we didn't use Nvivo or other software, but searched directly in the documents found.

4 Results

Of the 18 reports analyzed, 2 mention SDG and 9 mention ESG or GRI. There are 9 reports that do not mention either term. There are 2 reports where all three terms are mentioned. Among the sub-elements, the companies surveyed write most about the environment and social/employment issues in their annual reports, while fight against corruption and human rights are rarely mentioned. We would like to highlight three good practices.

One is Magyar Telekom PLC (2022), one of Hungary's largest telecommunications service providers. SDGs are mentioned as the main defining international guidelines and GRI is also applied. One of Magyar Telekom's commitments is to publish an annual report on its sustainability performance. ESG is included in the report e.g. as the company is a member of the FTSE Russel ESG Rating Sustainable Index. A stand-alone sustainability report is also available on their website, where the criteria of selecting topics/SDGs are presented. According to their materiality analysis process which is the part of stakeholder involvement scheme, SDG 4, 11, and 12 are the main goals to which the company can contribute.

CIB Bank PLC (2022) has been reporting its sustainability performance annually since 2005 in line with the GRI, so priority topics are defined in accordance with its requirements – the detailed materiality matrix is particularly noteworthy. Since 2018, financial report has also been supplemented by a shorter non-financial report, which was included in the financial chapter of the financial statements. For the first time, the researched 2021 edition report combines the previous sustainability report and the actual non-financial report (resulting in an integrated report), which includes a separate chapter on SDGs. The operating model and business conduct focus on seven SDGs (SDG 3, 5, 8, 9, 10, 12, 13) which are given priority attention. The definition of the topics is based on materiality analysis with the participation of stakeholder groups. ESG is mentioned 44 times in the Bank's report.

OTP Bank PLC's (2022) annual report is particularly good, with a strong organizational framework supporting the full integration of sustainability, which was completed in 2021. ESG transformation for both OTP Bank and its subsidiaries is managed by a permanent ESG Committee established by the Board of Directors. The OTP Group also reports on its social, environmental and wider economic

impacts and performance in a separate sustainability report. The sustainability report for the year 2021 is Group-wide, compliant with the GRI and assured by an external independent party. Although the annual report does not go into detail on the SDGs here, the sustainability report justifies their selection in detail. It refers to detailed, stakeholder-led materiality analysis. OTP Bank focuses on SDG 4, 6, 7, 9, 13, 16 and 17.

5 Discussion and Conclusion

Our research shows that Hungarian companies who are regulated by the CSRD face significant challenges. Even the few companies under the NFRD cannot fully comply with the requirements. Except of the good practices, companies try to avoid detailed data sharing and neither the auditors, nor the state or other stakeholders really expect more information. This practice provides a validation for the EU's new regulative motivation: like in the other EU member states, in Hungary as well, companies don't take the non-financial reporting regulation seriously, so it needs to be taken to a new level both in its scope and detailedness. That is the only direction in which non-financial reporting can achieve its real goal, to enable a more sustainable economic operation.

At the same time, companies are not alone in this challenge as there are a lot of effective guidelines and initiatives related to corporate sustainability issues and reporting connected to them. Moreover, EFRAG, authorized by the EU works on a comprehensive standard system (ESRS) which will provide useable indicators for reporting about the material sustainability impacts which are relevant for both the companies and their stakeholders.

There are more contributions of our paper. Firstly, in the theoretical part we demonstrated the parallelism of GRI and the new European system, ESRS in preparation. It shows that companies actively using GRI will have adequate experience in the transition to the new system. And today's good practices will be examples for other regulated organizations as well. This is particularly true as GRI is the mostly used international reporting framework for companies under NFRD in Hungary.

Secondly, in the empirical part, relating the topics, we concluded that different SDGs are in focus at different companies, which is a natural consequence of their different field of activity. The main message of the good practices is to involve stakeholders to the definition of significant, material topics.

Thirdly, we highlighted the main points of best practices. Looking at Magyar Telekom PLC's and CIB Bank's reports, which are at the forefront in terms of content and detail, we see that one company continues to produce a separate sustainability report, while the other merges it with the annual report. Both solutions have advantages and disadvantages. If the financial and non-financial reports are in the same structure, the content may be very fragmented, or the presentation of each issue may not be sufficiently detailed. When a separate sustainability report and other supplementary information is provided, this may not be sufficiently addressed. A recommended practice (as seen at OTP Bank) is to maintain the independent sustainability report beside the integrated one.

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Examination and Optimization of the Ecological Footprint of Embedded Rail Structures

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Abstract In urban planning practice, there has been a growing trend towards the displacement of car traffic, thereby reducing traffic congestion and air pollution, creating the foundations of a healthier, more livable urban environment. In the Hungarian cities, large-scale investments have recently been carried out or are being planned. Most of the investments focused the modernization and renovation of existing line sections, but there are also examples of new lines being built. Due to the increasing demands placed on rail transport (reduction of noise and vibration loads, as well as of life cycle costs), the use of embedded superstructures is gaining ground in Hungary as well. These superstructures are excellent from a technical point of view and have a lower environmental impact in terms of noise and vibration, but the cost savings and ecological footprint (EF) reductions vary between designs. The aim of our research is to explore how the social and economic sustainability development goals of rail transport infrastructure development can be achieved with the least environmental impact. The use of the EF indicator can also help corporate and policy makers to select and support the right construction technology.

Keywords:
urban planning, ecological footprint, tram tracks, construction projects, Hungary

JEL:
L7, O14, Q51 R42

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1 Introduction

One of the greatest challenges of the 21st century, while maintaining the continuous development of society, is the protection of the environment, especially including the achievement of climate targets (Skala, 2022). A globalized, industrialized world requires us to maintain, expand and modernize both passenger and freight transport in our cities and countries, as well as between countries, in response to ever-changing demands. Transport concerns are linked to five objectives among the 17 SDGs: target 3.6, 7.3, 9.1, 11.2 12.c (Brussel et al. 2019). In this study, we focus primarily on target 9.1. In the EU, increased attention is being paid to the development of rail and public transport as opposed to individual transport. The construction and operation of transport networks generates significant CO_2 emissions, which do not entail the emissions of the transport vehicles themselves. During construction and operation, emissions are primarily generated by the production, transport, and installation of materials. In this article, we compare two possible versions of so-called embedded track structures, which are frequently found in the tramway network of large cities, in terms of technical parameters and ecological footprint (EF).

2 Literature Review

The reason for selecting the carbon footprint as the ecological footprint indicator for our research was that it is one of the most widely used physical metric (Lin et al., 2018; Wackernagel et al., 2019). The Global Footprint Network (GFN) conceptualizes the EF indicator as comprising five land use categories, of which we only considered the ecological footprint from carbon emissions. In 2010, Chambers et al. (2010) developed the principles for the EF calculations used, which were further developed by Wackernagel and Beyers in 2019. Its applications therefore also include measuring material use in construction (McBain et al., 2018; Szigeti et al., 2023). There are some examples of ecological footprint calculations of transport network construction (de Bortoli, 2020; Gassner et al., 2018; Lv et al., 2021) in the literature, but the comparison of superstructural variants is a novelty of our research.

3 Methodology

3.1 Technical analysis of two tramway tracks structures

The two superstructure designs shown in Figure 1 are the subject of our comparative analysis. The technical solutions presented comply with the regulations in force for the Budapest Transport Company's line network. From a technical point of view, they can be considered equivalent, since both designs are dimensioned for the same load and their useful life is also considered to be the same, since the tested rails can be kept in the track up to the same wear value. The left side of the figure shows the structure with a B3 block rail and the right side with a 59Ri2 rail. The typical differences between the two variants are attributable to the height of the rail system used, so the block rail design results in a more economical structure. In the figure, the rails are shown in grey, the embedding material in red, the material-saving PVC tubes in blue and the reinforced concrete track slab in green. It is assumed that the structure of the load-bearing layer under the slab is the same in both cases, so that the lower plane of the slab (top of subgrade) is 170 mm deeper in the 59Ri2 rail structure, which requires additional excavation work.

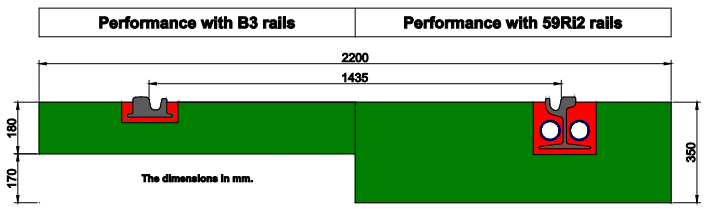

Figure 1: The performance of the investigated structures
Source: Authors' own illustration

3.2 Determination of the typical CO2 emissions of the presented technical solutions

The CO_2 emissions of the main components of the technical solutions presented in Chapter 3.1 (e.g. the embedding material) are considered from two perspectives. The first aspect is the so-called intrinsic emissions of the component material, while the second aspect is the emissions from the transport of the material. The CO_2 emissions from the installation are not

addressed in this article, as the technological possibilities are manifold and would increase the number of variations to be investigated beyond the scope of this paper. Another reason for simplification is that, since we are making a comparison, we are interested in the difference in CO_2 emissions between the two variants, which would not change significantly assuming the same construction method. However, if the difference in emissions between the technologies is to be considered, it is of course possible to quantify it. For similar reasons, the structure of the load-bearing layer under the subgrade is also not considered. In our analysis, the total useful lifetime emissions are differentiated according to the assumed useful lifetime of each component and expressed in kgCO_2/track meter/year.

In order to perform the comparative analysis, the five components shown in the following subsections were examined in detail. The specific CO_2 emissions for each material were all considered according to the Inventory of Carbon and Energy Database (ICE) v3.0. The first step in the study was to determine the mass of rail material per 1 m of track for both test cases. This was 109.22 kg/track meter for B3 rails and 116.28 kg/track meter for 59Ri2 rails. Based on ICE database v3.0, the specific value of CO_2 emissions is 1.27 kgCO_2/kg (structural steel). Taking this value into account, the CO_2 emissions of installed rail steel are 138.7 kg/track meter for B3 rails and 147.7 kg/ track meter for 59Ri2 rails.

In determining the amount of elastic embedding material, it was assumed that the thickness of the bottom layer of embedding compound used was a uniform 20 mm. Substituting this value into the formulae defined by Zoltán Major for average cross-sectional geometries of elastic embedding, the specific volume of the embedding material per 1 m of track was calculated. In the case of the 59Ri2 rail, the placement of 2 material-saving PVC tubes with a diameter of 70 mm each was also considered. The specific volume is 16,22 l/track meter for rail B3 and 52,61 l/track meter for rail 59Ri2. As different materials from several manufacturers may be technically suitable for use in the track structure as elastic embedding, an average density value of 0.9 kg/l was considered for the embedding material. The specific weight calculated on this basis is 14.6 kg/track meter for the B3 rail and 47.3 kg/track meter for the 59Ri2 rail. The specific value of CO_2 emissions based on ICE V3.0 is 4.84 kg CO_2/kg (flexible polyurethane foam). Taking this value into account, the specific CO_2 emissions for the installed elastic embedding material are 70.7 kg/track meter for the B3 rail and 229.2 kg/track meter for the 59Ri2 rail. Since the quantity of PVC

tubes installed is secondarily small compared to the volume of the other components, the CO_2 emissions from the PVC tubes are not considered in our analysis.

The load-bearing track slab consists of two components: concrete and a reinforcing steel frame. As a good approximation, the amount of reinforcing steel is calculated as 3% of the specific volume of the track slab. The specific volume of the concrete slab was first determined from its geometrical dimensions to calculate its own emission. Assuming a panel width of 2200 mm, the specific volume of the slab was calculated to be 0.396 m^3/track meter for a 180 mm thick slab and B3 rail, and 0.770 m^3/m for a 350 mm thick slab and 59Ri2 rail. In our calculations, the rail ducts have been omitted as an approximation for reasons of simplification. For concrete, a density of 2500 kg/m m^3 was assumed, at 97% of the volume. Thus, the specific mass of the concrete for the B3 rail is 0.96 t/ track meter, while for the 59Ri2 rail it is 1.87 t/track meter. Based on ICE V3.0, the specific value of CO_2 emissions is 0.132 kg CO_2/kg (precast concrete pavement). Taking this value into account, the CO_2 emissions for the installed concrete material are 130.7 kg/track meter for the B3 rail and 254.1 kg/track meter for the 59Ri2 rail. The mass of the reinforcing steel installed, with the previous simplifications, is 93.2 kg/track meter for rail B3 and 181.3 kg/track meter for rail 59Ri2. Based on ICE V3.0, the specific value of CO_2 emissions is 1.99 kg CO_2/kg (reinforcing steel). Taking this value into account, the CO_2 emissions for the installed concrete material are 185.6 kg/track meter for the B3 rail and 360.9 kg/track meter for the 59Ri2 rail.

For the calculation of the subsoil's intrinsic emission, we only consider the excess soil excavation due to the difference in thickness of the two track slabs, which is 170 mm for 59Ri2 rails. We do not consider the soil excavation required to construct the load-bearing layer structure underneath the track slab. For 59Ri2 rails, while considering the required additional track slab thickness of 170 mm and a width of 2200 mm, the additional excavation required is 0,374 m^3/track meter. The density of the soil was considered at 2000 kg/m^3. The mass of the excavated soil is 748 kg/track meter. Based on ICE V3.0, the specific value of CO_2 emissions is 0.024 kgCO_2/kg (compacted soil). Taking this value into account, the CO_2 emission is 17.95 kg/track meter for 59Ri2 rails. For rail B3, an excess of 0 mm can be considered, resulting in CO_2 emissions of 0.0 kg/track meter.

4 Results

To determine the CO_2 value from the transport of each component, the specific masses per 1 track meter as defined in Chapter 3.2. The data were used and results summarized in Table 1.

Table 1: Transport data

Component	Transport distance [km]*	Transport method*	gCO_2/tkm**	B3 rail $kgCO_2/t.m$	59Ri2 rail $kgCO_2/t.\ m.$
Rail	500	railway	26.7	1.458	1.552
Embedding m.	500	road (solo truck, >26t)	199.3	1.455	4.718
Track slab	250	road (solo truck, >26t)	199.3	47.847	93.036
Subsoil	50	road (solo truck, >26t)	199.3	0.000	7.450

Source: *: author's own assumption, **: Treibhausgasemissionen durch die Schieninfrastruktur und Schienenfahrzeuge in Deutschland

3.3 Calculation of the specific CO_2 emissions for the variants

The values per structure determined in Chapter 3 have been weighted by the estimated useful lifetime of each component to be able to consider the lifetime specific CO_2 emissions. Our results are summarized in Tables 2 and 3. The estimated useful lifetimes are our own assumptions.

Table 2: CO_2 emissions weighted by the estimated useful life of the component for B3 rails

Component	Material	Transport	ΣCO_2	Useful life	Specific value
	kgCO2/track m	$kgCO_2$/track m	$kgCO_2$/track m	year	kgCO2/track m/year
Rail	138.7	1.458	140.158	15	9.344
Embedding m.	70.7	1.455	72.155	15	4.810
Track slab	354.5	47.847	402.347	60	6.706
Subsoil	0	0	0	60	0.000
				Σ	**20.860**

Source: Authors' research

Table 3: CO_2 emissions weighted by the estimated useful life of the component for 59Ri2 rails

Component	Material	Transport	ΣCO_2	Useful life	Specific value
	kgCO2/track m	$kgCO_2$/track m	$kgCO_2$/track m	year	kgCO2/track m/year
Rail	147.7	1.552	149.252	15	9.950
Embedding m.	229.2	4.718	233.918	15	15.595
Track slab	689.4	93.036	782.436	60	13.041
Subsoil	17.95	7.450	25.4	60	0.423
				Σ	**39.009**

Source: Authors' research

Based on the results of Tables 2 and 3, it is evident that when optimizing the same track structure types, it is possible to significantly reduce CO_2 emissions by selecting the appropriate superstructure variant. If the total CO_2 emissions of the assumed track structures over a given

analysis period is to be investigated. For our investigation, the analysis period was expediently set equal to the maximum useful life of 60 years.

The ecological footprint, expressed in global hectares (gha), can be defined as the product of CO_2 emissions in tons multiplied by the Footprint Intensity of Carbon published by the Global Footprint Network (Lin et al., 2018) (Table 4).

Table 4: Ecological footprint in relation to the analysis period

	CO_2	EF
	t/track m	gha/ track m (CO_2* 0,338)
B3 rails	1,251599	0.42304
59Ri2 rails	2,315116	0.782509

Source: Authors' research

The results show that the 59Ri2 version has almost twice the ecological footprint of the B3 version.

5 Discussion and Conclusion

It appears that there are significant savings with respect to the reinforced concrete slabs and the embedding material, which make the B3 rail variant more favorable in terms of ecological footprint (too). It is evident that there are significant savings

regarding reinforced concrete slabs and embedding material, which make the B3 rail variant more favorable in terms of ecological footprint. Even without a precise calculation, it is clear that the cost of the structure will also be lower than the other variant in the comparison, making it more eco-efficient. We therefore recommend the use of an ecological footprint in transport planning decisions, which provides decision-makers with a simple way of interpreting information on the complex environmental impact of the solution to be implemented.

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URBAN DEVELOPMENT DECISIONS BASED ON THE ECOLOGICAL FOOTPRINT

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Abstract In the Hungarian cities, large-scale investments have recently been carried out or are being planned. Most of the investments focused the modernization and renovation of existing line sections, but there are also examples of new lines being built. Due to the increasing demands placed on rail transport (reduction of noise and vibration loads, as well as of life cycle costs), the use of embedded superstructures is gaining ground in Hungary as well. These superstructures are excellent from a technical point of view and have a lower environmental impact in terms of noise and vibration, but the cost savings and ecological footprint (EF) reductions vary between designs. The aim of our research is to explore how the social and economic sustainability development goals of rail transport infrastructure development can be achieved with the least environmental impact. The use of the EF indicator can also help corporate and policy makers to select and support the right construction technology.

Keywords: ecological footprint, urban development, construction projects, sustainability, Hungary

JEL: L7, O14, Q51

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1 Introduction

Kecskemét was a Hungarian market town and agricultural trading center, which became the county seat of Bács-Kiskun county after the county restructuring in the 1950s (Figure 1). Over the past 70 years, the city's economic profile has increasingly shifted towards services and industry, with an important milestone being the announcement of the Daimler-Benz car assembly plant in 2008. The factory's establishment briefly revitalized the city's development, resulting in an increase in population from 107,000 in 2001 to 112,000 in 2014 (HCSO), despite the natural decrease of around -1% typical of the city (Lechner Knolewledge Center, n.d.).

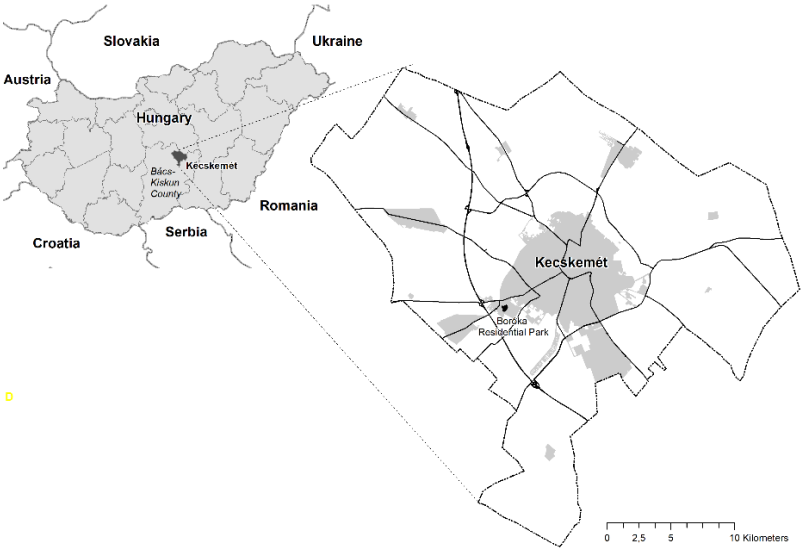

Figure 1: The geographical location of Kecskemét
Source: ArcMagyarország (2021).

In addition to the Mercedes plant, suppliers and other related service providers (logistics, facility management) also settled in the city, which overall significantly improved the city's employment (the ratio of taxpayers increased from 46.16% in 2010 to 52.03% in 2018) and unemployment (decreased from 7.26% in 2010 to 3.07% in 2018) indicators (Lechner Knowledge Center, n.d.). However, the city failed to exploit this high-prestige FDI investment fully, and over the past decade, it

has not been able to diversify its economy (e.g. by developing tourism). As a result, a strong dependence on the automotive industry has developed.

The Mercedes investment positively affected housing construction in the early 2010s, when there was a significant increase in demand for rental apartments and houses. As a result, the proportion of new-built homes between 2010 and 2013 significantly exceeded the national average (0.42-0.72% compared to 0.17-0.48%). After a two-year downturn between 2014 and 2016, another upward trend started from 2017 onwards. In 2018, the proportion of new-built homes was more than twice the national average (0.92% compared to 0.4%), and in 2019 it was also significantly above (0.81% vs 0.47%) (Lechner Knowledge Center, n.d.). This is because the city is in a favorable geographical location, the capital is easily accessible from here, and there was no significant drop in property prices after the 2008 crisis due to the Mercedes investment. In fact, since 2017, the average price per square meter of residential real estate has nearly tripled (from 565 EUR/sqm to 1.507 EUR/sqm) (ingatlannet.hu).

The first residential parks appeared in Kecskemét in the second half of the 2000s. According to Hegedűs and Csatári (2012), there were five residential parks in the city in 2009, totalling 448 apartments. Over the past decade, numerous new residential parks have been created in the city, including Boróka Park, the subject of our research. The project started in 2016 and is in its second phase, with two-thirds of the planned 600 apartments already sold. The sales experience indicates that about two-thirds of buyers are investors who purchase the properties for rental purposes or in the hope of future price increases. Of the 23-hectare area owned by the investors, only 3 hectares are planned for residential real estate development, while the rest of the area will be used for commercial and green areas, as well as other services such as healthcare, in collaboration with the municipality, creating a new city center (Portfolio.hu, 2022) (Figure 1).

2 Theoretical Background

The EF is one of the best-known and most widely used complex measures of the environmental impact of consumption or production in terms of land area. It is as broad and versatile as money (Wackernagel et al., 2019a; Wackernagel et al., 2019b). Our former researches (see Szennay et al., 2021; Szigeti et al., 2021; 2023) suggest

that there is a demand for an easy-to-use EF calculator, which is free, and SMEs (Small and Medium Enterprises) could reliably and without any professional expertise measure environmental impacts of their activity. Results of (Szigeti et al., 2021) showed that it is feasible to develop a standardized calculator for SMEs considering only the common elements of environmental impacts (i.e. meals, fossil fuels, electricity, etc.), while EF of material usage could be added by using sector specific satellite calculators (Szennay et al., 2021). In the case of the construction industry, such a calculator was developed and tested on Hungarian dwellings by (Szigeti et al., 2023). EF calculation of construction materials is based on the (unpriced) construction breakdown system (CBS), which is generally accepted in the Hungarian industry and consists of four steps. First, item materials are identified and converted into a common and preferred measurement (e.g., m^2, m^3, etc.). It is important, as some material types are used in more phases or in different types. Then, in the second step, materials are aggregated for the whole project. Third, measurement units are converted into more appropriate units only for calculation if needed. Finally, in the fourth step, EF is calculated using Inventory of Carbon and Energy 1.6a (Hammond & Jones, 2008) or 3.0 (Embodied Carbon Footprint Database, n.d.). For some unique items, such as windows and doors, EF is calculated in a separate analysis.

3 Methodology

The first practical test of the previous theoretical building material ecological footprint calculation (Szigeti et al., 2023) was carried out on the construction of the Boróka housing estate. Using a sample of two new build condominiums from Hungary with two and five stories and 28 and 123 apartments, respectively, (Szigeti et al., 2023) calculated a specific EF of 0.20 and 0.17 global hectares per square metres of useful floor area. The difference can be explained by the fact that the smaller condominium was built in three separate buildings with only two stories, so much more structural elements, namely structural concrete and steel, were needed. An important limitation of the calculation is that the as-built condition was considered in both cases, while mechanical (e.g., electricity, heating, water, heating, cooling, etc.), fencing, and all items not included in the CBS were excluded. In our further calculations, since we are mainly interested in orders of magnitudes here, we will use the value of 0.2 gha per square meter. The research was conducted in January and February 2023.

The first phase of development includes 59 apartments with various floor plans. The typical apartment sizes are: 33 m² flats, 48-54 m² apartments with 1.5 - 2 bedrooms, 68-78 m² 2.5-bedroom apartments, 110 m² 4-bedroom apartments.

The condominium was built on an undeveloped plot of land of approximately 3000 m² (Figure 2). According to our calculations based on the building plans, the total area of the first floor is 857.16 m². The second development phase includes 2x63 apartments with a variety of floor plans. The typical apartment sizes are: 25 to 30 m² of flats, one-and-a-half or two-bedroom apartments between 35 and 45 m², 50-55 m² living room + 2 bedrooms, 60-65 m² living room + 3 bedrooms. The condominium will be built on an undeveloped plot of land of approximately 6600 m² (Figure 2). According to our calculations based on the building plans, the total area of the first floor is 1347.2 m².

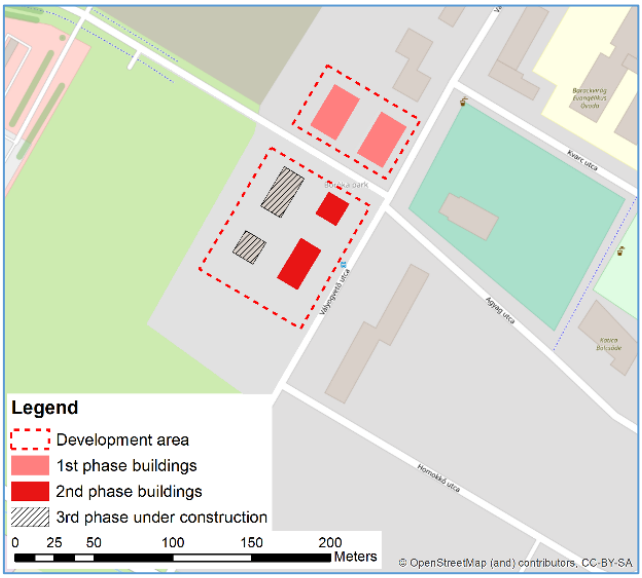

Figure 2: The Boróka Residential Park development phases
Source: OpenStreetMap

Based on the results of structural and energy audits, we estimate that the buildings have an expected lifetime of 50 years, after which they can continue to operate after the necessary interventions. In our further calculations, since we are primarily interested in orders of magnitude, we use the life expectancy of 50 years.

4 Results

The main results of our research are summarised in Table 1. Column A shows typical dwelling sizes (30, 50, 70 and 110 square meters). These are compared with hypothetical family sizes (column B). The per capita square meter values are given in column C. Column D shows the flat sizes multiplied by the ecological footprint per square meter (A*0.2 gha/ m^2). In column E, the value in column D is divided by the expected life of the dwellings (50 years). Finally, column F is the quotient of the values in columns E and B.

Table 1: Summary of our results

A	B	C	D	E	F
floor area (m^2)	family size (capita)	floor area/capita (m^2)	total footprint (gha)	footprint/year (gha)	footprint/year/capita (gha)
30	1	30.00	6	0.12	0.12
30	2	15.00	6	0.12	0.06
50	1	50.00	10	0.20	0.20
50	2	25.00	10	0.20	0.10
50	3	16.67	10	0.20	0.07
70	1	70.00	14	0.28	0.28
70	2	35.00	14	0.28	0.14
70	3	23.33	14	0.28	0.09
70	4	17.50	14	0.28	0.07
110	1	110.00	22	0.44	0.44
110	2	55.00	22	0.44	0.22
110	3	36.67	22	0.44	0.15
110	4	27.50	22	0.44	0.11
110	5	22.00	22	0.44	0.09

The results in Table 1 show that this value is between 0.06 gha/person and 0.44 gha/person. When interpreting the results, it is essential to note that we are only looking at the completion of the dwelling up to its structural condition, we do not include the building envelope or new appliances, and we do not consider the ecological footprint of the use. Our research includes many simplifications, we have not considered the footprint of built-up areas and energy used in construction, so our estimates only consider the part of the real environmental impact.

5 Discussion and Conclusion

According to the latest Global Footprint Network data (2022), Hungary has a per capita ecological footprint of 3.9 gha. In our research, we used the example of Boróka Park to investigate how much buying a dwelling contributes to the annual ecological footprint. At this stage of the research, it is not possible to say what the overall impact of the construction of Boróka Park will be on the footprint of the people moving there, but at around 25 square meters per capita, the ecological footprint per capita will remain at 0.1 gha per capita per year. This can be easily compensated by the more favorable energy characteristics of the new housing. It is also advisable to link public subsidies to limited dwelling sizes and larger family sizes. The resulting EF value can be used to position the homes for sale and to help consumer choice in the environmentally conscious consumer segment. This is the first application of the prior theoretical results of our research (Szigeti et al., 2023) so we do not have comparative data, which is a limitation of the interpretation of the results.

The transition to sustainable cities and the related SDG11 will be one of the biggest economic challenges in the coming years, where ecological footprinting can provide significant support in both the planning and implementation phases. The cornerstones identified in our research can provide real help in planning and decision-making.

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The Role of New Keynesian Semi-structural Macroeconomic Forecasting Model in Realisation of Sustainable Development Goals in Uzbekistan

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Abstract New reforms have been adopted in banking system of Uzbekistan since 2017 as monetary policy framework directed from monetary targeting to inflation targeting (IT). Liberalization of the national currency, reaching 5% inflation target on medium-term and operational independence of the Central Bank of Uzbekistan (CBU) have started progress of the reforms. The CBU has set policy rate as the primary tool of monetary policy in the context of inflation targeting regime. According to the experience of countries that implemented inflation targeting regime successfully, it is recommended to use the New-Keynesian semi-structural macroeconomic forecasting model to achieve price stability with the help of policy rate. This paper analyses efficiency of monetary policy by proposing to use New-Keynesian semi-structural macroeconomic forecasting model for Uzbekistan. The model includes 4 main blocks: Demand block (Output gap), Supply block (Philips curve), Exchange rate block (Uncovered Interest Rate Parity (UIP)), Interest rate block (Taylor rule). We expect that this model helps to forecast medium-term macroeconomic scenarios especially reaching inflation target and steady state of the economy.

Keywords:
policy rate, output gap, uncovered interest rate parity, dollarization, money market

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1 Introduction

Practical monetary policy has greatly improved because of the adoption of inflation targeting. Inflation-targeting central banks can still make significant advancements by being more precise, organized, and open about their operational goals (for example, by using an explicit intertemporal loss function), their forecasts (for example, by selecting the best projections of the instrument rate and the target variables), and their communication (in the form of announcing optimal projections of the instrument rate and target variables) (Svensson, 2007). The president of Uzbekistan signed an official document as a formal strategy to inflation targeting regime in 2017[1]. This decree determined the main guidelines and priorities of moving from money targeting to inflation targeting regime. According to the decree, the CBU is responsible for making inflation 10% in 2021 and 5% inflation target in 2023. Also, coordination of fiscal and monetary policy, preferential loan termination, and keeping fiscal deficit under 1.5 percent to GDP are determined as a smooth transition to IT regime. CBU has developed operational mechanism forecasting and analytical framework since the transition period. As an improvement of operational mechanism, CBU uses repo and swap auction when there is shortage of liquidity in money market, or it uses deposit auctions and repo operations when there is excess liquidity. CBU uses a variety of econometric models to forecast macroeconomic variables such as Bayesian VAR model for forecasting inflation and the Dynamic Factor Model for forecasting GDP[2].

This paper introduces a small macroeconomic quarterly projection model (QPM) for Uzbekistan. We propose to use simple canonical QPM model to analyze interest rate and exchange rate channel of monetary policy. The QPM is a semi-structural model for open economies that help formulate medium-term macroeconomic forecasts.

[1] President decree 5877, "Improving monetary policy by step-by-step transition to inflation targeting regime". https://lex.uz/docs/-4600824

[2] Guidelines of Monetary policy for 2021-2023. https://cbu.uz/en/monetary-policy/trend/

2 Theoretical Background

Tex Norman and Schmidt-Hebbel defined the monetary transmission mechanism as "the process through which changes in monetary policy instruments affect the rest of the economy and, in particular, output and inflation" (Norman & Klaus 2002). Monetary policy impulses transmit through various channels, affecting different variables and different markets, and at various speeds and intensities. The QPM is a tool for cogently organizing ideas and data into baseline assessments, risk comparisons to baseline predictions, and the nature of policy responses to various types of shocks (Berg et al., 2006.a). Research of Al Rasasi and Cabezon showed that the interbank market has seen rapid development since the introduction of inflation targeting regime in Uzbekistan but there are still some signs of market segmentation, as some banks are consistently borrowers or lenders in the market. Another problem with interbank market is underdeveloped government security markets (Al Rasasi & Cabezon, 2022).

There are certain factors that impede the effective conduct of monetary policy for Central Asian Countries (Isakova, 2008). A significant level of dollarization and financial sector underdevelopment can pose a serious obstacle to the functioning of monetary transmission. Additionally, exchange rate pass-through is the strongest channel of monetary transmission in Asian Countries. It is possible to consider QPM as a method which consists of two calibrated models (Cote et al., 2006). The first model is used to study determinants of long-term equilibrium in the economy and the constant impact of economic shocks or policy changes. The second model is made up of a set of dynamic relationships that show paths leading from initial conditions to the implicit steady-state solution, or long-term equilibrium. According to Berg, QPM has four main blocks: aggregate demand block (IS curve), inflation block (Phillips curve), monetary policy rule block (monetary policy reaction function) and exchange rate block (assuming uncovered interest rate parity) (Berg et al., 2006b). The model is structural because each of its equations has an economic interpretation, but the equations are not fully micro-founded. It is perceived as a general equilibrium model because it describes how the equilibrium is established in the economy, and not only in some markets or sectors. It is considered as a stochastic model in that random shocks affect each endogenous variable, and it is possible to use the model to derive measures of uncertainty in the underlying baseline forecasts.

Some applications of the QPM model have been documented in the literature. For example, Nelyubina (2021) researched regional indicators of Russia with the help of QPM model. It allows the policy maker to investigate how shocks in one location spread to others, how various regions react to global shocks, and what the ideal monetary policy should be, according to the author. Another implementation of QPM was used on a study to determine neutral interest rate for Kyrgyzstan. The paper analyzed data from 2000 Q1 to 2019 Q2 and concluded that the real neutral interest rate for Kyrgyzstan was 4% based on various model estimates (Time-Varying Parameter Vector Autoregressions, Dynamic stochastic general equilibrium) and 3.7% based on the QPM model. This figure is higher than from many developing countries due to high public debt, high-risk premiums, low restricted creditors' rights, the rule of law, and low local savings (Teodoru & Toktonalieva, 2020). Drovbishevskiy (2008) conducted research on transmission mechanism to assess the effectiveness of monetary transmission of Russian economy based on data from 1999-2007, by using the method of vector auto regression to compare effectiveness of three channels. His result was that credit channel is the most effective channel compared to the other two ones (i.e. the interest rate channel, and the asset price channel).

Empirical research to analyze monetary policy transmission in Emerging Markets and Developing Economies has been done by IMF researchers (Marques et al., 2020). The results show that interest rate rises are the main sources of reducing economic growth and inflation. In addition, the findings suggest that central banks with modern monetary policy framework such as adapting to inflation targeting, high level of transparency and independence tend to focus more on monetary policy transmission mechanism than financial market development. According to Papadamou, there is a link between central bank transparency and the transmission of monetary policy through interest channel for emerging market economies. It has been shown that when the central bank's monetary policy is more transparent, the monetary transmission is more effective (Papadamou et al., 2014). The main reason for the low efficiency of the monetary transmission is the imperfection of methods for forming the volume and structure of the monetary base (Mishchenko et al., 2021). Banks' characteristics, such as the capital ratio, exposure to domestic sovereign debt, percentage of non-performing loans and stability of funding structure are the reasons for heterogeneity in the pass- through of conventional monetary policy changes and the location of a bank is irrelevant in this respect

(Altavilla et al., 2020). In small open economies with rigid exchange rates, the effectiveness of domestic monetary policy through the interest rate channel is quite limited (Petrevski & Bogoev, 2012). Iddrisu (2020) and others studied interest rate channel and lending channels of monetary policy transmission for South Africa. The results show that one percent reduction of key policy rate increase bank lending rate to 0.29%. In turn, one percent rise of bank lending rate reduces investment to 0.063%. One percentage decline of investments brings to fall inflation by 0.074%. Musil and Pranovich (2018) made a small structural model by considering economic structure of Belarus. New blocks explain added wage policy, direct lending by government to state-owned enterprises, dollarization in Belarus. Andrle and coauthors (2013) developed a semi-structural new-Keynesian open-economy model for Kenya, a low-income country. The results show that while the imported food price shocks contributed to Kenya's inflation dynamics in 2008 and thereon, it was found that an accommodating monetary policy also played a significant influence. Benes et al. (2017) estimated effectiveness of monetary policy transmission mechanism by using a production version of QPM. The model incorporates specific features of Indian economy such as agricultural sector, food and non-food prices and credibility of Central Bank of India.

3 Methodology

QPM model was developed by IMF economists as a part of forecasting and monetary policy analysis system (Berg et al., 2006b). Based on the literature above, we have made core model structural equations and parameters. The equations are made by considering specific features of economy of Uzbekistan. The core equations are as follows:

Output gap equation

$$l\_y\_gap_t = a_1 l\_y\_gap_{t-1} + a_2 l\_y\_gap_{t+1} - a_3\, rmci_{t-1} + a_4 l\_y\_gapf_t + shock\_l\_y\_gap_t \quad (1)$$

$$l\_y\_gapf_t = a_5 l\_y\_gapf_{t-1} + shock\_l\_y\_gapf_t \quad (2)$$

Output gap equation estimated business cycle. It resembles Euler equation and approximates how monetary conditions index(mci), foreign output gap(l_y_gapf) and demand shock determines output gap ($l\_y\_gap_t$) of the domestic economy. The

lag of output gap (l_y_gap) at time (t-1) is added to capture the persistence of the business cycle. This is a structural stochastic equation; therefore, it includes the structural demand shock. Unlike in the domestic part of the model, there is no economic structure (or economic interpretation) in the foreign block. All variables in the foreign or external block follow simple, auto regressive processes (order one) as the second equation above (i.e., the foreign output gap). Monetary conditions index (equation 3) approximates weighted average of two variables: the real interest rate gap (r) and the real exchange rate gap (z). Both variables are determined calculating deviation from the long-term trend or equilibrium level. When both gaps are zero, monetary policy is neutral, which means that there is no stimulating or contracting demand in the economy.

Monetary conditions index (rmci)

$$rmci_t = a_6 r\_gap_t + (1 - a_6)(-z)\_gap_t \quad (3)$$

Philips curve

By considering inflation factors in Uzbekistan, we divided ordinary Philips curve equation into 4 sub-part equations, and then we aggregated all sub-parts.

Philips curve for non-food items

$$dl\_cpi\_nf_t = a_7 dl\_cpi\_nf_{t+1} + (1 - a_7 - a_8) dl\_cpi\_nf_{t-1} + a_8 dl\_cpi\_imp\_nf_t + a_9 rmc\_nf_t + shock\_dl\_cpi\_nf_t \quad (4)$$

The equation (4) shows Philips curve for non-food item. According to the equation, expected value ($dl\_cpi\_nf_{t+1}$) and lag value ($dl\_cpi\_nf_{t-1}$) are the variables that determine non-food inflation equation. Importantly, import of non-food items ($dl\_cpi\_imp\_nf_t$) and real marginal cost index (rmc_nf_t) are the other variables of the non-food inflation equation. We made a separate equation for imported non-food inflation. Imported non-item inflation equation includes lag of its own value, inflation of food items and deviation of nominal exchange rate from its trend value. The QPM has separate equation for real marginal cost index. This index is a weighted average of two gap variables, namely the output gap, and the exchange rate gap. We will show equation of the real marginal cost index later, together with food items.

Philips curve for food items

$$dl\_cpi\_f_t = a_{10} dl\_cpi\_f_{t+1} + (1 - a_{10} - a_{11}) dl\_cpi\_f_{t-1} + a_{11}(dl\_cpi\_imp\_f_t) + a_{12} rmc\_f_t + shock\_dl\_cpi\_f_t \quad (5)$$

Variables of food items of Philips curve is almost the same with the non-food items. It covers expected value ($dl\_cpi\_f_{t+1}$) and lag value ($dl\_cpi\_nf_{t-1}$), imported food inflation variable ($dl\_cpi\_imp\_f_t$) and real marginal cost index (rmc_f_t).

Real marginal costs

$$rmc\_nf_t = a_{13} l\_y\_gap_t + (1 - a_{13})(l\_z\_gap_t) \quad (6)$$

$$rmc\_f_t = c_{14} l\_y\_gap_t + (1 - a_{14})(l\_z\_gap_t) \quad (7)$$

As we can see from equation (6) and (7), real marginal cost index for both food and non-food items are determined by output gap which is the pressure by domestic firms to produce one additional unit of output and exchange rate gap which varies with the relative prices of imports.

Philips curve for regulated items and services

$$dl\_cpi\_reg_t = a_{15} dl\_cpi\_reg_{t-1} + (1 - a_{15}) d4l\_cpi_t + shock\_dl\_cpi\_reg_t \quad (8)$$

Philips curve for regulated items include the lag value of the regulated items with ($dl\_cpi\_reg_{t-1}$), year on year inflation rate $d4l\_cpi_t$ and the shock to the regulated items.

Finally, we can aggregate all Philips curve subpart equations (equations 4,5,6,7 and 8) to make a single Philips curve. The equation below shows aggregated Philips curve equation for our model.

$$l\_cpi_t = a_{16} l\_cpi\_f_t + a_{17} l\_cpi\_nf_t + (1 - a_{16} - a_{17}) l\_cpi\_reg_t + shock\_l\_cpi_t \quad (9)$$

Interest rate – Taylor rule

Next block of our model is the interest rate rule. It bases on the Taylor rule. The model assumes that the central bank reacts to the deviation of inflation and output gap in a structured way. The equation for interest rate rule is as follows:

$$irr_t = a_{18} irr_{t-1} + (1 - a_{18})(irr\_tnd_t + a_{19} dev\_cpi_t + a_{20} l\_y\_gap_t) + shock\_irr_t \quad (10)$$

The lag value of policy rate (irr_{t-1}) signals that the central bank reacts to changes smoothly not abruptly. The equation also has neutral interest rate irr_tnd_t and deviation of inflation dev_cpi_t and output gap $l\_y\_gap_t$. The equation is structural, so it has policy shock that is $shock\_irr_t$.

Exchange rate rule (UIP condition)

The last block of domestic part of our model is the uncovered interest rate parity (sometimes called UIP condition). UIP simply says that the exchange rate at time t is equal to the expected level of the exchange rate in the next period and the differential between foreign and domestic interest rates. Our model takes more sophisticated version of the UIP condition that considers differences in risk and liquidity of domestic and foreign assets. The equation for UIP condition is as follows:

$$l\_s_t = (1 - a_{21}) l\_s\_tar_t + a_{26}(l\_s_{t-1} - (i_t - i\_f_t - prem_t)/4) + shock\_l\_s_t \quad (11)$$

Equation (11) shows that the nominal exchange rate at time t is determined based on the target level of exchange rate ($l\_s\_tar_t$), nominal exchange rate at time t-1 and the interest rate differential between domestic and foreign country that considers the risk premium.

Untill now, we have finished 4 main building blocks of domestic part of our model. Foreign blocks are determined with simple auto regressive processes (AR1). The next step is to choose parameterization before running model simulation. According to the literature (Musil, 2018; Berg et al., 2006b), we may select model parameters by

considering Uzbekistan's economic development level and current position. Table 1 shows the parameters that we chose to simulate our model.

Table 1: Model parameters

a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}
0.40	0.30	0.15	0.15	0.80	0.85	0.30	0.05	0.25	0.30

a_{11}	a_{12}	a_{13}	a_{14}	a_{15}	a_{16}	a_{17}	a_{18}	a_{19}	a_{20}	a_{21}
0.05	0.25	0.85	0.85	0.80	0.43	0.35	0.50	1.20	0.50	0.50

Source: Authors' estimations.

The parameters above have been chosen based on the studies of the International Monetary Fund working papers (Benes et al., 2017; Musil and Pranovich, 2018). This parameter is used to evaluate poor and developing countries. Once we have checked different parameter values, reasonable values are chosen for simulation. Based on the simulation results, we checked impulse response of variables with 0.5 shock parameter for demand shock. Once the shock applied, output gap rises dramatically in the first period of analysis and reaches long-term trend in the first quarter of 2026. As the output gap increases, inflation rate also raises in the same quarter and the central banks also decides to increase policy rate. Next, we checked variables by applying non-food supply shock with 1.10 parameter and food supply shock with 1.0. The inflation rate rises in both cases and central bank responds with contractionary monetary policy in the first period. Then, as the demand declines, inflation and interest rates come back to target level in the first quarter of 2026.

4 Discussion and Conclusion

Uzbekistan is one of the post-Soviet countries which have made structural reforms in monetary policy. The country adapted to inflation targeting regime in 2017 and since then CBU changes the monetary policy framework accordingly. In general, inflation targeting central banks use policy rate as a main tool to effect business cycle then the inflation rate. The objective of this paper was to make a model to analyze how effectively interest rate and exchange rate channel work in Uzbekistan. The paper illustrates structural equations of QPM model that is used by IMF and central banks in inflation targeting countries. Implementation of the model can be made by the MATLAB software with the help of IRIS toolbox.

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Application and Comparison of Online Calculators for Calculating the Economic Efficiency and Sustainability of Vehicles

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Abstract The aim of this work is to use different online comparison calculators in order to compare the results and to work out limitations and potentials for improvement. The research hypothesis is that due to uniform initial data of the case study, the different calculators provide approximately the same results. To investigate this hypothesis, four steps are carried out: first research and categorization of online calculators; second creating a case study and scenarios; third application of online calculators and fourth comparing the results of the calculations, also with the benchmark calculator DIPO-tool, for a critical evaluation. Generally, one can say that only a small number of the reviewed calculators can provide a functionality that is necessary for a professional and proper comparison of economic efficiency and sustainability. For the economic comparison, one can state, that in some cases, the calculation results deviate strongly from each other, contrary to the formulated hypothesis. When considering sustainability, it becomes very clear that tank-to-wheel and well-to-wheel considerations fall far short of the mark and must be supplemented by a holistic approach that includes the manufacturing phase and the after-use phase (recovery and recycling).

Keywords:
alternative drive technologies, calculation tool, case study, life cycle assessment, profitability analysis

JEL:
M10, R40, Q56

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1 Introduction

Against the backdrop of climate change and increasingly concrete political measures such as the EU ban on new combustion engine cars from 2035, there is growing interest in finding out about the sustainability of vehicles. However, this is not just about an ecological assessment, but also about making an economic decision. Numerous online comparison calculators are available for this purpose, and this article takes a closer look at them. The focus is on the question of whether different comparison calculators deliver the same results with the same initial data.

2 Theoretical Background

The basic prerequisite for comparing vehicles is the availability of comparison criteria for assessing economic efficiency and sustainability. Criteria for the economic efficiency of vehicles mainly concern the acquisition costs minus any subsidies and the residual value of a vehicle as well as running costs such as energy consumption (Bertram & Bongard, 2014; Hacker et al., 2015) The decision criterion for assessing economic viability is usually the total cost of ownership (TCO) of the vehicles (Jöhrens et al., 2021). For the consideration of environmental sustainability, generic terms in the literature include environmental accounting, life cycle analysis (LCA) or life cycle assessment (LCA). These terms holistically encompass the phases of production, use, and recycling or disposal of products (Koch & Toedter & Weber, 2020). Other terms commonly used in this context are "Well-to-Tank (WtT)", which covers greenhouse gas emissions on the production side from the source to the vehicle tank, and "Tank-to-Wheel (TtW)", which stands for a purely consumption-based view. The term Well-to-Wheel (WtW) is the sum of energy (WtT) and vehicle processes (TtW) (Schmied & Mottschall, 2014).

A wide range of online comparison calculators for calculating the economy and sustainability of a vehicle are available on the Internet, which include a wide variety of factors and data in their comparative calculations.

Comparison calculators with stored databases have a limited selection of vehicles and models that the user can select for comparison. Some user-related parameters can be determined by the user, such as the annual mileage or energy prices. Vehicle-related data such as list prices and costs for insurance, inspection or taxes are

predefined with approximate values. Examples of this type of online comparison calculator include Alternative Fuels Data Center (U.S. Department of Energy, 2022), E-Fahrer (E-Fahrer, 2022), Journey Cost Calculator (Zap-Map, 2022), and Linz AG (Linz AG, 2022). Due to the numerous features of the Linz AG e-mobility calculator, it is considered for this case study.

Comparison calculators with stored formulas do not access databases. The user must research all data, such as acquisition or running costs, on the Internet or via other sources of information. This takes time, but is rewarded by more precise results, as no approximate or average values are used. Another advantage is that users are not restricted by a limited choice of vehicle models. Examples of this type of online comparison calculator include EMIL from the Vorarlberg Energy Institute (Energieinstitut Voralberg, 2022), e-Stations (e-Stations, 2022), and Stromdrive (Stromdrive, 2022).

3 Methodology

The EMIL and e-Stations calculators were selected for the case study. The reasons for this are the diverse input options and features for sustainability consideration. A case study comparing an internal combustion engine (ICE) vehicle, Mini Cooper S, with a comparable electric vehicle (BEV), Mini Cooper SE, is used to evaluate the selected online comparison calculators.

Configuration of the comparison vehicles and case study data are shown in Table 1.

The annual mileage is 20,000 km and after a holding period of five years the vehicles are sold with a residual value of 30 %. Prices are constant over the entire holding period.

Table 1: Configuration of the comparison vehicles and case study data

Feature	Mini Cooper S (ICE)	Mini Cooper SE (BEV)
Engine power	(131 kW) 178 PS	(135 kW) 184 PS
Energy consumption	6.9 l / 100 km	18 kWh /100 km
CO_2-Emissions	160 g/km	0 g/km
Tank capacity / Battery size	44 l	32.6 kWh
Mini Service Inclusive Plus package (p. a.)	€460.13	€449.82
Comparison price with equivalent equipment	€37,180	€39,980
Subsidy		€9,000
Insurance	€830.36	€652.75
Vehicle tax/Other costs	€124/€48	0/€32
Gasoline/Power	1.90 €/l	0.49 €/kWh plus €5.99 per month
GHG Bonus (Elektroauto-News, 2023)		€350

Source: https://www.mini.de/de_DE/home/the-mini-family.html?&tl=sea-gl-DE_MINI_NEWCARS_CONFIGURATOR_DEU_BND_SEA_MINI2023DE%20LO%20AL%20002-mix-miy-MINI+%C3%BCbergreifend-sech-BRAND_BG_CONFIGURATOR_PERF-.-p-mini%20cooper%20konfigurator-.-.&clc=sea-gl-DE_MINI_NEWCARS_CONFIGURATOR_DEU_BND_SEA_MINI2023DE%20LO%20AL%20002-mix-muks&gclid=EAIaIQobChMIvNm--ub-_QIV6oxoCR1rlAnuEAAYASAAEgKwIPD_BwE&gclsrc=aw.ds

3.1 Application of online calculators

The following is a brief description of how the data from the case study was processed with the selected comparison calculators. Limitations of the comparison result from the fact that in some cases not all data of the case study could be considered. Examples of this are the GHG-bonus, which could only be taken into account with EMIL and the benchmark comparison calculator DIPO-Tool, the missing input option of a residual value with e-Stations and Linz AG and the missing recording options of the charging current subscription fee and the costs for TÜV/AU with EMIL, e-Stations and Linz AG.

3.1.1 Online calculator of Linz AG

A database with approx. 400 gasoline, diesel and electric vehicles is stored in this calculator. The Mini Cooper SE and Mini Cooper S vehicles selected for TCO calculations are not available with their individual configuration and must be created in the database itself. In the comparison calculator, a useful life of 12 years is fixed for the vehicles. The shorter holding period cannot be stored. Annual mileage, financial support for car purchase, prices for fuel and electricity, and maintenance

costs can be set variably according to the case study. However, a vehicle tax is fixed and cannot be adjusted to the actual vehicle tax to be paid. For sustainability, only the TtW-CO_2 for fully electric vehicles (0 kgCO_2 /kWh) are shown. No values are stored for combustion vehicles, so that the CO_2 savings shown in the evaluation are not comprehensible.

3.1.2 Online calculator EMIL

The calculator EMIL determines the TCO of the vehicles to be compared with the aid of stored formulas. For individual vehicle categories standard values are stored. The two Mini Coopers can be assigned to the small car category. Performance and consumption values already stored can be replaced by values researched by the user. Gasoline is selected as the energy source for the Mini Cooper S, while the Austrian electricity mix (0.27 kg CO_2e/kWh) is selected as one of the four available choices for the Mini Cooper SE. Holding period and annual mileage can be specified individually.

An environmental bonus and a GHG-bonus can be deposited for the Mini Cooper SE. The annual maintenance costs, tax/insurance and energy costs for fuel (in €/l) or electricity (in €/kWh) as well as the expected residual values at the end of the holding period can be set according to the case study. Sustainability is determined in terms of cumulative greenhouse gas emissions over the entire life cycle. The subdivision is made into the category's vehicle production, production of fuel/electricity, driving operation and battery disposal. The greenhouse gas emissions generated during vehicle production and battery disposal are allocated proportionately to the useful life of the vehicles. Other environmental parameters that are calculated pro rata over the entire life cycle of the vehicles are, for example, particulate matter emissions and NO_x-pollutant emissions.

3.1.3 Online calculator e-Stations

This comparison calculator works with formulas, but it has also a database of hybrid and electric vehicles, which, however, only contains data on acquisition costs, consumption and capacity of the battery. For the TCO comparison, the data from the calculator is replaced by the acquisition costs from the configuration of the BEV. The data for a conventional vehicle with an internal combustion engine must be set

by the user. All data of the case study can be transferred except the residual value and income from the sale of the GHG quota are not considered. Only Tank-to-Wheel-CO_2-emissions are considered for sustainability. For gasoline, a value of 2.32 $kgCO_2$ per liter is stored as the CO_2-TtW coefficient. Since full electric vehicles have no greenhouse gas emissions during driving, 0 $kgCO_2$ per kWh is shown as the TtW-value.

3.1.4 Benchmark calculator DIPO-Tool

The DIPO tool is a professional solution for the holistic consideration of the economic efficiency and sustainability of vehicles in the field of fleet management and controlling. It consists of various Excel tables and was designed for teaching and research purposes at the Ludwigshafen University of Applied Sciences (Bongard & Friesenhahn & Wolff, 2022; Bongard & Schröder, 2022). In the expansion stage used, the calculation of LCA values in particular was advanced. Bases on an approach developed by Fraunhofer ISI (Wietschel et. al. 2019), depending on a vehicle class a CO_2-value is assigned to the respective vehicle for the manufacturing phase and assumed to be 13 years for a vehicle lifetime. For small cars, these values are 5.0 tCO_2 (0.385 tCO_2 p. a.) for internal combustion vehicles and 8.4 tCO_2 (0.646 tCO_2 p. a.) for electric vehicles. If we now assign values for a small vehicle to both vehicles, the following picture emerges when the useful life is considered on a pro rata basis:

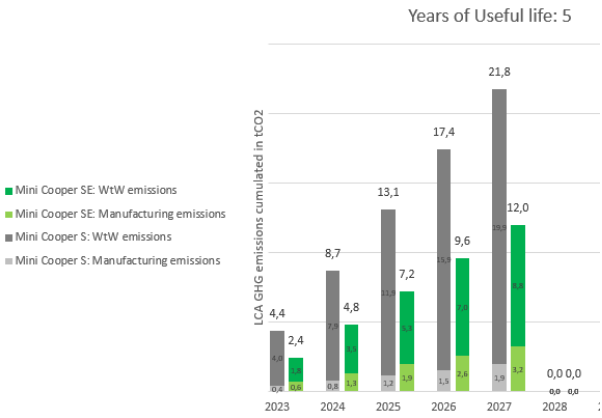

Figure 1: DIPO-Tool LCA Chart
Source: Author's research.

The proportional CO_2-consumption of the manufacturing phase forms a foundation that considers the CO_2-emissions of the manufacturing phase. Further inclusion of the recovery and recycling phase in the calculation methodology of the DIPO tool is already being planned.

4 Results

Table 2 and 3 show the calculation results for the two vehicles of the case study.

Table 2: Results for Mini Cooper S (ICE)

Mini Cooper S	Linz AG	EMIL	e-Stations	DIPO tool (Benchmark)
● Profitability analysis				
TCO in Euro (5 years)	38.120	46.206	57.362	**46.448**
Deviation to benchmark absolute (in Euro)	*-8.328*	*-242*	*10.914*	
Deviation to benchmark in %	*-17,9 %*	*-0,5 %*	*23,5 %*	
Preferable alternative related to TCO	*no*	*no*	*no*	*no*
● Sustainability analysis				
TtW-CO_2-emission in kg	100	14.704	16.008	**16.700**
WtW-CO_2-emission in kg	not available	18.789	not available	**19.900**
LCA-CO_2-emission in kg (comparison basis)	not available	21.697	not available	**21.800**
Deviation to benchmark absolute (in kg)	-	*-103*	-	
Deviation to benchmark in %	-	*-0,5 %*	-	
preferable alternative related to CO_2	-	*no*	-	*no*

Source: Authors' compilation

In case of the combustion vehicle, it can be stated for the economic efficiency that all calculators do not show the combustion vehicle as the more economical alternative. The EMIL calculator shows the smallest deviations in the TCO (-0.5 %), while the other two calculators show considerable deviations of -17.9 % (Linz AG) and 23.5 % (e-Stations). In terms of sustainability, the weaknesses of the Linz AG and e-Stations calculators are clearly evident, as they do not report any LCA values. The deviation between the benchmark and the EMIL calculator is very small at -0.5 %.

Table 3: Results for Mini Cooper SE (BEV)

Mini Cooper SE	Linz AG	EMIL	e-Stations	DIPO tool (Benchmark)
● Profitability analysis				
TCO in Euro (5 years)	27.240	31.591	45.313	32.088
Deviation to benchmark absolute (in Euro)	-4.848	-497	13.225	
Deviation to benchmark in %	-15,1 %	-1,5 %	41,2 %	
Preferable alternative related to TCO	yes	yes	yes	yes
● Sustainability analysis				
TtW-CO_2-emission in kg	0	0	0	0
WtW-CO_2-emission in kg	not available	5.346	not available	8.800
LCA-CO_2-emission in kg (comparison basis)	not available	9.872	not available	12.000
Deviation to benchmark absolute (in kg)	-	-2.128	-	
Deviation to benchmark in %	-	-17,7 %	-	
preferable alternative related to CO_2	-	yes	-	yes

Source: Authors' compilation

For the electric vehicle, it can be stated for the economic efficiency that all calculators show the electric vehicle as the more economical alternative. The EMIL calculator shows the smallest deviations for the TCO (-1.5 %), while the other two calculators show proper deviations of -15.1 % (Linz AG) and very high 41.2 % (e-Stations). In terms of sustainability, there are larger deviations between the benchmark and the EMIL calculator, which shows LCA CO_2 emissions 17.7 % lower.

5 Discussion and Conclusion

The assumption that different comparison calculators provide the same results based on the same input data cannot be upheld, as there are sometimes considerable deviations. Basically, the results are only correct in the sense that the electric vehicle is shown to be the more advantageous alternative for the case study, both in terms of economic efficiency and sustainability. Compared to the DIPO tool as a benchmark, the EMIL calculator performs very well. One limitation, however, is that the EMIL calculator only offers a choice of four electricity CO_2-coefficients.

From the user's point of view, it is therefore important to find out about the corresponding quality of the expected results before using a comparative calculator. It is helpful here to benchmark against a scientifically based calculator that has been tested in numerous practical case studies, such as the DIPO tool used here. Particularly against the backdrop of an urgent need for a more sustainable orientation in the acquisition and use of vehicles, it is imperative to apply a holistic, systemic view based on approaches to vehicle life cycle analysis.

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THE ROLE OF SOCIAL MEDIA IN SUSTAINABLE CONSUMPTION: A CLASS-WISE ANALYSIS

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Abstract Public opinion must change if green consumerism is to be promoted and making this change will be easier with an understanding of society's movement toward green consumption. Businesses can benefit from this adjustment and make their processes and products more sustainable and eliminate any kind of waste. This study uses sentiment analysis to determine social media's contribution to the promotion of sustainability. It intends to quantify public attitudes toward green consumption and identify significant points of attitude shift by applying text mining and deep learning algorithms on structural and semi-structured data from YouTube. Long Short-Term Memory, Support Vector Machines and Random Forest algorithms were used in this study. In addition, class-wise performance was measured. The keywords related to eco-friendly consumption were selected and then a class-wise performance analysis was performed related to each word structure. Encouraging sustainability and sustainable consumption by businesses can be very beneficial for them. In this way, companies will be able to strengthen both their own and their country's resilience with a sustainable economy.

Keywords: sustainability, green consumption, sentiment analysis, class-wise analysis, social media

JEL: Q56, C38

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1 Introduction

In recent years, the public has become increasingly aware of the negative environmental effects of modern civilization. As a result, there has been a growing interest in sustainable practices, with an emphasis on environmentally friendly consumption. Green or sustainable consumption means using goods and services that are produced in an eco-friendly and sustainable way (Kong et al., 2002). This includes using products made from recycled or renewable materials, which are made ethically and have a low carbon footprint. Sustainable consumption also involves reducing waste, preserving resources, and choosing options that have minimal impact on the environment. This shift towards green consumerism requires a change in public opinion. A transition to a sustainable civilization can be aided by promoting attitudes and values that support sustainability (Akenji, 2014). This would involve education and awareness-raising campaigns, as well as training programs for leaders in various sectors. Moving towards sustainable lifestyles is a gradual process that requires changes in the way we live our lives, including the way we shop and behave (Gilg et al., 2015).

In order to contribute to the relevant literature, this research conducted sentiment analysis on social media data, specifically YouTube, to provide an example of how to explore the current status and popularity of sustainability related topics with YouTube commentators. The study's focus on text mining and deep learning algorithms to understand public attitudes and identify significant points of attitude shift presents a valuable resource for understanding consumer behavior and the public's view on sustainability. This study tries to show how deep learning methods and social media data can play a valuable role in promoting sustainable consumption among the general population. The results of this study provide significant insights for both scholars and businesses working towards a more sustainable economy.

2 Literature Review

Most of the research in literature related to sustainability have used questionnaires on various factors and a group of participants. For example, Ahamad and Ariffin (2018), investigated the knowledge, attitudes and practices of students towards sustainable consumption with the data obtained through a questionnaire. As a result of the research, it was revealed that although the students' knowledge about

sustainable consumption was at a high level, they were at a moderate level in attitudes and practices.

Jalali and Khalid (2019) conducted a study on the green product purchasing behaviors, values and precautions of influencers with the survey data they conducted with Instagram users. The Theory of Reasoned Action (TRA) and the Uses and Gratifications Theory (UGT) were used in their studies.

Sajeewanie et al. (2019) proposed a model for predicting consumer purchase intentions and behavior towards green products. Their model took perceived consumer behavior, habit, subjective norms, environmental attitude, environmental knowledge and awareness, price, brand image, and marketing information into account.

Wang (2021) collected data with a questionnaire survey, to investigate the effect of consumers' green cognition on green consumption behavior. The outcome of the research shows that, green consumption knowledge of consumers and their views on environmental problems can primarily enable the development of green consumption awareness of consumers. The methodology will be described in the section after this. Results and an analysis of that data will then be presented, followed by conclusions.

3 Methodology

The 6489 comments that were obtained from Youtube are notably relevant to the three major green keywords, which we will refer to as T0, T1, and T2. You may find the relevant comments by doing a search on Youtube for usernames, their acronyms, and the names of the most common keywords that each user used, such as #Balance of trade, #Sustainability, and #Green items. For the sake of this research and analysis, the analysis has been carried out in a collective fashion. As a result, the hypothesis that the distribution of emotions that are represented in comments that are relevant toward a single remark is indicative of the emotions associated with that term is not accepted. In order to accommodate this, the class of attitudes that is taken into consideration includes those that also reflect T0 and T1, T0 and T2, T1 and T2, none, and unrelated. It is important to note that the mining of comments

from Youtube took place from January 2020 all the way through December 2020, as this year was the year of the Covid-19 pandemic, the most data was obtained.

The purpose of using classification methods such as Long Short Term Memory (LSTM), Support Vector Machines (SVM), and Random Forest was to analyze and quantify public attitudes towards sustainable consumption as expressed through YouTube comments. By adhering to these selection criteria, we aimed to create a diverse and comprehensive dataset of YouTube videos and their corresponding comments, allowing for an in-depth analysis of public attitudes towards sustainable consumption.

In the end, the following fields were chosen; firstly, ID: An individual ID will be assigned to each remark. In order to maintain the users' anonymity while yet identifying them, it is recommended that a numerical ID be used as an identifier rather than the username. Secondly, text: Displays the user's first remark that was uploaded to the site. Thirdly, class: There are three columns, with two of them being designated for each of the three keywords. The binary data that may be entered into these columns is determined by whether the comment is oriented towards any one, two, or all of them, or even none of them at all. After combining the three columns, the resulting binary number is then transformed to decimal so that it may be used as an easy-to-understand indicator. It might be anywhere between 0 and 6, inclusive.

3.1 Preprocessing

As compared to other online social media platforms for text and video, YouTube has its own unique traditions, which is one of the reasons why extra caution is used during the cleaning and pre-processing of unprocessed comments. The following procedures are included in the pre-processing stage: first, Non-standard lexical tokens, such as, emotions, and anomaly punctuation, are filtered out just after the tokenization process; second, duplicate comments are excluded to maintain the uniqueness of each comment; third, standard stop words are removed; and finally, case folding is performed in order to convert all of the tokens into lower case letters. There are a considerable number of terms that are out of vocabulary, however these words are not removed from the data.

3.2 Annotation

There are three annotators who are possibly aware of the green keywords and intelligently aware of the keywords that are utilized either in favor of or against a user for annotation. Instead of assigning a definitive positive or negative feeling to each comment, annotators were tasked with determining if the statement in question was an opinion or hypothesis. Annotation categories included the following six subcategories: T0, T1, T2, (T0 and T1), (T1 and T2), and none. T0 = green products, T1 = sustainability, T2 = balance of trade, shown in Table 1. A suitable class was given to the collection of superfluous annotations so that the distribution of comments could be identified, rather than the group being thrown out as unnecessary.

Table 1: Classes and Corresponding keywords

Classes	Corresponding keyword
None	None
T0	Green products
T1	Sustainability
T2	Balance of trade
T0 and T1	"Green products" and "Sustainability"
T0 and T2	"Green products" and "Balance of trade"
T1 and T2	"Sustainability" and "Balance of trade"

3.3 Feature Extraction

There are three distinct kinds of feature vectors that are based on term-frequency, and they are as follows: Term Frequency – contrary document density for unigrams, bigrams, and trigrams. The Term density – contrary document density is a major statistical method that is used to transform a collection of unprocessed documents into a matrix in the form of term density vs. contrary document density. In other means, it gives a term more weight if it appears less often in the material being analyzed.

3.4 Long Short-Term Memory

Recurrent neural network (RNN) units that can learn long-term dependencies are referred to as long short-term memory (LSTM) units. A recurrent neural network (RNN) made of LSTM units is essentially what an LSTM network is. A cell, an input

gate, an output gate, and a forget gate are the component parts that make up a typical LSTM unit (Gao et al., 2020). The cell can remember values for arbitrarily long periods of time, and its three gates are responsible for controlling the flow of information into and out of the cell. The analysis of sequential data is where the LSTM model (Saini, 2021), which belongs to the category of deep learning, shines the brightest. It is used in the processing of jobs like language translation, music production, and voice recognition, amongst others.

3.5 Support Vector Machines (SVM)

A method for machine learning that is drawn from analytical learning theory and is based on the notion of structural uncertainty reduction is referred to as a discriminative classifier. This approach is also known as the Support Vector Machine (SVM) (Pisner & Schnyer, 2020). A separation hyper-plane that has optimality between the two classes of a training dataset is found using the support vector machine (SVM). The hyperplane with the greatest distance from the training dataset that is located closest to it is used to calculate this optimal separation. Conventionally, supervised learning approaches like support vector machines (SVM) are used for classification, regression, and the identification of outliers (Abdullah & Abdulazeez, 2021).

3.6 Random Forest

A random forest (RF) is a model that is made up of a collection of tree-structured models with the formula h(x, k), where k = 1,..., where the k are independent random vectors that are distributed equally and where each tree casts a unit vote for the class that has the most users given the input x. The bagging algorithm serves as the foundation for the RF, which also makes use of the Ensemble learning approach. Using the given subset of data (Breiman, 2001), it generates many random trees and then aggregates the results of all of those trees. One benefit of using a RF is that, in comparison to using basic Decision Tree models, it can produce more accurate predictions because of its reduction of overfitting and variance (Schonlau & Zou, 2020).

4 Results and Discussion

The data that are shown in Table 2 are the result of the study of annotations. The bulk of the 6489 comments that were gathered exhibit a feeling toward the term T0. This represents 30.1% of the total comments. In contrast to this, the proportion of comments that reflect attitudes toward T1 is just 19.05%, while the percentage of comments that show sentiments for T2 is even a much lower percentage, at only 19.09%. This demonstrates that there are a significant number of people on Youtube that prefer the green keyword T1. It's interesting to note that out of all the comments, there are 1097 that indicate a preference for a combination of the terms T 0 and T1. This accounts for 16.7% of the total comments. Yet, the favor seen for T0 and T2 is 8.9%, and the favor observed for T1 and T2 is 9.4%, both of which are very low.

In addition to LSTM, several other machine learning techniques, such as Support Vector Machines and Random Forest, are used in order to do a comparative analysis of the comment data which can be seen in Table 3. Cross-validation using stratified 6-folds is performed on the whole data set for the purpose of validation. The LSTM and the SVM had the greatest precision out of all the classifiers, coming in at 0.76 and 0.73 respectively. The LSTM model has the greatest recall at 0.77, which is equivalent to the model's term-frequency representations. The LSTM and SVM models exhibit the greatest F1-Scores, which are respectively 0.74 and 0.7. By looking at everything together, the performance of RF is the worst of all of them. The LSTM classifier has the capability of achieving maximum accuracy.

Table 2: Comments statistics

Sentiment Classes	No. of comments in each class	% of comments in each class
None	126	1.95
T0	1947	30.1
T1	1249	19.05
T2	894	13.9
T0 and T1	1097	16.7
T0 and T2	573	8.9
T1 and T2	603	9.4
Total	6489	100

Table 3: Evaluation of classifiers regarding a variety of characteristics

Classification method	Precision	Recall	F1-Score
LSTM	0.76	0.74	0.7498
SVM	0.73	0.71	0.7198
RF	0.68	0.72	0.6994

In Table 4, each of the seven classes' precision, recall, and F1-Score are shown according to their respective class. The relevant classes with the greatest precision, 0.81, is the class T0, whereas the relevant classes with the lowest precision are T0 and T1 together. Surprisingly, the class T0 results in the greatest recall, and the class T0 results also provide the highest F1-Score. The fact that the "None" class obtained substantial values of achievement measures may be attributed to the fact that it is clearly differentiated from all of the other classes since all of the other classes have feelings, however the "None" class does not contain any emotion at all.

Table 4: Class-wise performance of LSTM

Classes	Precision	Recall	F1- Score
None	0.81	0.72	0.758
T0	0.79	0.81	0.793
T1	0.75	0.74	0.744
T2	0.76	0.73	0.738
T0 and T1	0.65	0.69	0.664
T0 and T2	0.71	0.74	0.724
T1 and T2	0.73	0.75	0.736

5 Conclusion

In order to investigate the many different learning models, some key characteristics are retrieved from the comments based on the inverse document frequency of phrase frequency. The examination of the gathered data reveals the existence of a green behavior on Youtube, which accounts for more than thirty percent of all the green keywords-driven comments that were retrieved. The assessment of the annotated dataset itself was performed using LSTM in addition to numerous machine learning models, and encouraging results were found using LSTM and SVM.

This study only focuses on sentiment analysis of social media data from YouTube, which may not be representative of the entire population's attitudes towards green consumption. Also, this study only uses three different algorithms, and there may be other algorithms that could provide better results for sentiment analysis. The practical value of this article is that it provides insights into public attitudes towards green consumption and sustainability, which can be helpful for businesses and policymakers in developing strategies to promote sustainable practices.

In conclusion, the findings of this study have the potential to provide important findings to raise awareness of sustainable consumption in businesses and encourage end consumers. Encouraging sustainability and sustainable consumption by businesses can be very beneficial for them, as academic studies in this field have shown that companies trying to protect the environment and prevent pollution can benefit from improved operational efficiency, lower costs, better brand image and better profits (Chen, 2015; Stål and Jansson, 2017). In this way, companies will be able to strengthen both their own and their countries' resilience with a sustainable economy.

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The Impact of the COVID-19 Pandemic on Financial Markets: A Meta-analysis From a Global Perspective

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Abstract This study aims to examine the impact of the COVID-19 pandemic on international financial markets in developed and developing countries. We have applied the approach of meta-analysis, meta-regression, critical analysis and the case study analysis. The empirical results of the meta-analysis show that the COVID-19 pandemic has affected the financial markets of developed countries through reduced supply, reduced demand, and economic instability. On the other hand, in developing countries, three indicators impact the international financial markets during the COVID-19 pandemic, such as confidence, expectations and changes in the consumption model. According to the results of the meta-regression, it is concluded that new daily cases of COVID-19 and deaths have negatively affected the daily returns of financial markets globally. The case study answers the research question of whether gold is a good hedge for stock portfolios during the COVID-19 pandemic. The findings of this study present several policy implications for governments around the world to adopt early proactive strategies and measures to control and protect international financial markets from a negative downturn in future economic recessions that pandemics may cause and to increase investor confidence.

Keywords:
COVID-19,
financial markets,
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stocks,
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1 Introduction

This paper aims to analyze the impact of the COVID-19 pandemic on financial markets from a global perspective. In 2020, The breakout and spread of COVID-19 substantially impacted the macroeconomic conditions in every nation and the state of the world's financial markets. The stock market, one of the most significant financial markets, takes the burden of severe emergencies first and is the primary carrier of multidimensional risk spreading. In March 2020, there were four stock market crashes in the U.S. More than 20% of the drop has been accumulated on China's Shanghai and Shenzhen stock exchanges. The economy of Brazil, Japan, and other countries have also experienced significant declines. The performance of the world's stock markets is delicate, and there is extensive market contact. The spread and contagion of systemic financial risk in international markets present short-term, fast, and time-varying characteristics. The research question of this study is as follows: How has the COVID-19 pandemic affected the performance of international financial markets? This study's hypothesis is that the COVID-19 pandemic has negatively affected the financial markets through a decrease in supply, a decrease in demand and economic instability.

2 Literature Review and Meta-analysis

The rapid spread of the COVID-19 outbreaks and its declaration as a pandemic by the World Health Organization has led to fear and interest in other historic pandemics. In the last 300 years (Hong et al., 2021), reported about 10 pandemics and argued that because of the recurring pattern of irregular periodicity, the possibility of new medical disasters in the future could not be ignored. Among them, pandemics such as the Black Death or bubonic plague in the fourteenth century and the influenza of 1918, known as the Spanish flu during 1918-1919, were the most severe, causing the death of approximately 30 to 60 million people (Jonung & Roeger, 2006). In recent years, many authors in their studies have analyzed how the COVID-19 pandemic has affected the performance of international financial markets and the investments of global corporations. Table 1 presents, through the meta-analysis method, the empirical findings of studies by different authors regarding the effects caused by the COVID-19 pandemic on the performance of different financial markets.

Table 1: Meta-Analysis of existing studies related to the effects of the COVID-19 pandemic on financial markets

Authors	Year	Variables	Methods	Empirical Findings
(Estrada, Koutronas, & Lee, 2021)	2020	The number of new cases of COVID-19, the performance of financial markets	Spatially interconnected multidimensional coordinate model	Analysis of ten major stock markets around the world shows that the effects of Covid-19 could generate damage similar to the financial crisis of 1929.
(Adekoya & Oliyide, 2022)	2021	Eurocurrency (EVZ), Equity (VIX and EMV-ID)	Fractional Integration Tests, Granger-Causality Test	The findings show that COVID-19 has a significant causal effect on the relationship between assets. Notably, the effect of the pandemic on the correlation between markets is stronger mainly in the low and middle quantiles, while only in a very few cases is significance found.
(Shear & Ashraf, 2022)	2020	Islamic stock market returns, conventional stock market returns, increase in confirmed cases of COVID-19	Paired T-tests and OLS regression techniques	Overall, the findings show that Islamic stock markets perform better before and during COVID-19 than conventional ones, and the negative impact of the pandemic on stock markets is relatively less for Islamic indices.
(Aslam, Aziz, Nguyen, Mughal, & Khan, 2020)	2020	Exchange rate, return from six international currencies	Multifractal Detrended Fluctuation Analysis	The findings of this study show different degrees of forex market efficiency before and during the outbreak of COVID-19. Investors in the Forex market can structure their investment and risk management strategies to exploit market inefficiencies.
(Merkoulova & Veld, 2022)	2022	Personal equity risk premium (PERP), expectation of returns, cost of capital	Questionnaire Method - PERP	The results show that the traditional equity risk premium is not relevant to individuals for two reasons. The first reason is that the expectations of individuals in the stock market are very heterogeneous. The second reason is that the risk-free rate is not the real opportunity cost of capital for individuals.

Authors	Year	Variables	Methods	Empirical Findings
(Corbet, Hou, Hu, & Oxley, 2022)	2022	Stock market, variables of the COVID - 19 pandemic	Joint Contagion and Structural Break Test	The results presented strongly suggest that the optimal hedging strategy will vary over time and among hedged assets, especially when an economy faced a significant shock as evidenced by the recent COVID-19 pandemic.
(Sulaiman, 2020)	2021	Economic growth, market return.	Multiple Regression Model	In terms of market speed, the results showed that the pace of declining returns accelerated following the announcement by the World Health Organization that declared Covid-19 a pandemic.
(Utomo, 2021)	2021	Stock return, stock price, firm's market capitalization.	Analysis of panel data - multiple regression	This study suggests that the COVID-19 pandemic and lockdown policies have a mixed impact on Indonesia's stock market returns.
(Rendall, Brooks, & Hillenbrand, 2021)	2021	Demographics, personality traits, locus of control, self-esteem, attitude towards debt, financial literacy	Content Analysis	Our findings have potentially important implications for lenders, regulators and debt counseling services about the types of people who are most likely to get into debt trouble.
(Chaudhary, Bakhshi, & Gupta, 2020)	2021	Stock market returns, market factors	ARCH – GARCH Model	The study finds that stock returns are integrated with market factors and generally have little stock-specific volatility.
(Zhao, Rasoulinezhad, Sarker, & Taghizadeh-Hesary, 2022)	2021	Interest Rate, GDP	Qualitative Method - AHP	The results show that developed nations need policies to support under the consequences of the pandemic, while the pandemic has caused many threats to social life in developing countries.

Source: Data processing by authors (2023)

According to the results of the meta-analysis, we can conclude that the COVID-19 pandemic has negatively affected the performance of international financial markets, and the results of other authors' studies show that the effects of the COVID-19 pandemic can generate consequences similar to the Great Depression Crisis of 1929 and the financial crisis of 2007-2009. In terms of market velocity, the results showed

that the pace of declining returns accelerated after the World Health Organization announcement declaring COVID–19 a global pandemic. According to the results of the meta-analysis, we can conclude that stock returns are integrated with market factors and generally have small stock-specific volatility.

3 Scientific Research Methodology

This paper applied the qualitative and quantitative methods of scientific research. The meta-analysis method was applied using the qualitative approach, while the meta-regression method was applied through the quantitative approach. These quantitative methods have been applied based on the studies of various authors who have analyzed the impact of the COVID-19 pandemic on global financial markets. Through the method of meta-analysis, the statistically synthesized results from a series of studies collected through a qualitative methodological procedure are discussed. The main purpose of applying the meta-analysis method is to aggregate and compare the separate empirical results of different studies after converting them into a common metric called effect size. The data of the meta-analysis are based on the various scientific studies of different authors that have been published in scientific journals with an impact factor by publishers such as Elsevier, Emerald, Springer, Wiley, Frontiers, Jstor, etc. Approximately 25 scientific papers were analyzed within the meta-analysis, and only 11 of these studies were presented. The selection criteria for these scientific papers were as follows: the quality of the scientific journal, the scientific arguments of the authors regarding the empirical findings of the study, the time involved in the study, the practical contribution of the paper, etc. To support the empirical results of this research, this study applied meta-regression analysis, a quantitative and statistical approach that examines in more detail the exogenous variables that may affect the strength of the correlation between COVID-19 and the performance of global financial markets. Six studies by other authors were included in the meta-regression analysis, where the econometric findings of these studies are presented in this part of our study, and the statistical results are discussed through comparative analysis.

4 Results of Meta – Regression Analysis

In continuation of this paper, a summary of the econometric results of studies by other authors who have analyzed the impact of the COVID-19 pandemic on the performance of global financial markets will be presented through meta-regression analysis. The impact of the COVID-19 pandemic on market returns is consistent with existing studies predicting a negative impact of new cases of COVID-19 on market returns. The OECD (2020) finding that expanding daily COVID-19 testing capacity can help the economy and improve workforce health is consistent with the favourable effects of expanded daily COVID-19 testing on market returns. Similarly, a greater number of COVID-19 tests will aid in a decrease in new COVID-19 cases. This leads to reduced volatility in investor response to the COVID-19 pandemic and, as a result, causes upward movement in the market.

In the U.S. and other sophisticated capital markets, many researchers have uncovered crucial truths about the effects of the COVID-19 pandemic. Emerging markets, where the COVID-19 pandemic has caused record declines and significant uncertainty, have realized much less scientific research on the consequences of the COVID-19 pandemic. In particular, this study, through meta-regression, examines the effect of COVID-19 on these markets before and during the pandemic. Measuring the true impact of COVID-19 can be done using the empirical process of this paper. There are several things that investors, governments and other institutions need to remember when it comes to the impact of COVID-19 on the stock market.

According to the meta-regression results, we can conclude that the COVID-19 pandemic has negatively affected the financial performance of various financial markets globally. The increase in the number of new cases and deaths caused by the COVID-19 pandemic has negatively affected the volatility of returns from investments and the decrease in the level of these returns. Furthermore, the positive rate of new cases of COVID-19 has also negatively affected market returns. In other words, the COVID-19 pandemic has unexpectedly negatively impacted global markets. Furthermore, the number of new daily tests for COVID-19 performed has a positive impact on market returns. Likewise, the study also found similar impacts for both developed and emerging markets, except news announcements of new daily deaths from COVID-19 positively impact emerging market returns. According to

the econometric results of the meta-regression analysis, we can conclude that the increase in the number of new cases of COVID-19 is the increase in volatility in the various global financial markets and the returns of various indices.

Findings are summarized in Table 2.

Table 2: Meta-Regression of existing studies related to the effects of the COVID-19 pandemic on financial markets

Authors	Variables*	No. of observations	Regression Coefficients	Std.Error	T - Test	P-Value	R^2
(Tuna & Tuna, 2022)	The number of new cases of Covid-19 (I.V)	2148	0.540	388.265	11.473	0.000	0.892
	IDEMV- Infectious Disease Equity Market Volatility Index (D.V)	1646	0.550	47.283	10.706	0.018	0.893
	DJI- Dow Jones Islamic Stock Index (D.V)	2107	(- 0.537)	104.362	5.627	0.000	0.889
	DJC- Dow Jones Convertible Stock Indices (D.V)	1412	(- 0.714)	20.267	12.704	0.040	0.481
	The price of oil (I.V)	1937	0.529	16.557	9.296	0.009	0.888
	The price of gold (I.V)	3642	0.714	64.887	7.588	0.000	0.481
(Tan, Ma, Wang, Feng, & Xiang, 2022)	Chinese financial market returns (D.V)	560	(- 0.543)	0.0027	7.198	0.034	0.819
	Indian market returns (D.V)	560	(- 0.401)	0,00697	6.127	0.037	0.951
	Russian market returns (D.V)	560	(- 0.473)	0.01506	6.724	0.036	0.630
	Brazilian market returns (D.V)	560	(- 0.694)	0.00841	6.194	0.031	0.540
(Sansa, 2020)	Confirmed cases of COVID-19 in China and Shanghai (D.V)	25	0.277	5.6	4.973	0.000	0.518
	Confirmed cases in New York (I.V)	2982	0.264	1.0736	2.458	0.000	0.174
(Ali, Alam, & Rizvi, 2020)	Regional indices respectively World – WRLD (D.V)	58	0.0017	147.81	5.19	0.000	0.614
	The benchmark US Treasury bond index (I.V)	58	0.0077	14.00	3.69	0.03	0.694
	Bitcoin, Oil WTI (I.V)	58	0.0011	2203.501	4.45	0.000	0.313
	Gold – GLD (I.V)	58	0.0011	2203.501	1.18	0.000	0.852
(Klona, 2021)	GDP per cap. (D.V)	327	0.0654	12.80	1.15	0.002	0.364

Authors	Variables*	No. of observations	Regression Coefficients	Std.Error	T - Test	P-Value	R^2
	GDP (D.V)	327	0.0913	0.31	0.41	0.029	0.336
	Covid-19 (I.V)	327	0.0023	-6.99	14.74	0.05	0.412
	Hiv / AIDS (I.V)	327	0.0041	15.46	-1.22	0.05	0.579
	H1N1 (I.V)	327	0.0043	5.63	7.66	0.05	0.422
(Çelik, Yilmaz, Emir, & Sak, 2020)	Italian stock market – FTSE MIB (D.V)	973	0.0028	3.998	27.27	0.030	0.347
	French stock market – CAC 40 (D.V)	973	0.30	4.141	36.16	0.032	0.308
	Total verified verified number of cases TVNC (I.V)	973	0.60	6.609	10.72	0.018	0.603
	Total number of verified deaths TVND (I.V)	973	0.64	5.577	9.701	0.034	0.648
	Number of daily cases NDC (I.V)	973	0.47	6.609	13.590	0.060	0.475

5 Discussion and Conclusion

We can infer from the findings of this study that the COVID-19 pandemic has had a detrimental impact on the performance of international financial markets. Several policy implications are presented in this study for both investors and governments. First, the government should take early proactive responses and control measures to prevent financial markets from a negative downside in the event of the next pandemic. This is because the daily new COVID-19 cases and deaths negatively influence market returns. Second, the increasing market returns that COVID-19 test runs have positively impacted show that investors are confident in the government's reaction to the COVID-19 epidemic. Governments should thus boost investor confidence by expanding the capacity for COVID-19 testing, which can help contain and slow the spread of the pandemic and draw more investors to the stock markets. Instead of an unforeseen rise, it is argued that well-designed algorithms can achieve this increase in a testing capacity. Third, both developed and emerging market returns are roughly equally affected by the COVID-19 epidemic. Because such steps and information will assist governments in reassuring the populace, nations and global communities must cooperate in disseminating accurate information and carrying out mutually reinforcing actions to prevent the COVID-19 pandemic. The greatest course of action to lessen the effects of COVID-19 on the financial markets of developed nations is to announce and support a stimulus plan that can foster advancement in infrastructure, innovation, and industry, as well as promote fair labour conditions and economic growth.

On the other hand, aiding needy families and announcing a stimulus package is the ideal course of action in developing nations when the COVID-19 epidemic has more significant effects on financial markets due to social considerations. It is important to stress that the detrimental consequences of COVID-19 on different facets of the economy, particularly financial markets, call for swift and effective policy responses from nations. Effective cooperation between the public and commercial sectors and financial institutions is essential to make the most of all available resources and decrease the negative consequences of this epidemic on financial markets. There should also be a plan for short-, medium-, and long-term strategies to maintain the financial market's stability. Governments and central banks should assist struggling individuals, families, and organizations (i.e., micro and small companies). All of these measures could improve the environment for global advancement. The findings

demonstrate the need for policies relating to fulfilment in poor countries while the pandemic has increased dangers to social life in rich countries, stressing the necessity for policies to help financial institutions under the epidemic's impact.

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PUBLIC POLICY OPPORTUNITIES FOR THE TRANSITION TO A CIRCULAR ECONOMY: HIGHLIGHTS OF SCIENTIFIC RESEARCH

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Abstract The paper aims to reveal the highlights of scientific research dedicated to public policy opportunities for the transition to a circular economy. It reflects the findings of the literature review based on 119 scientific articles. Research accents tend to be systematized according to compliance with the universal goals of public policy: Stimulate a design for the circular economy, manage resources to preserve value, make the economics work, invest in innovation, infrastructure, and skills, and collaborate for system change. Our research may prove useful to economic policy makers working toward the transition to a circular economy. Along with identifying current scholarly highlights, the article suggests opportunities for future research and thus offers interesting conclusions for researchers interested in the intersection of circular economy and public policy. This paper will be useful for the further development and systematization of conceptual tools to accelerate the transition to a circular economy.

Keywords:
transition, SDGs, circular economy, public policy, sustainable development

JEL:
H11, Q01, Q58

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1 Introduction

There are many reasons to move from a linear economy to a circular economy (CE). According to various estimations, the use of resources has tripled over the past 50 years, and is expected to double by 2050 unless production approaches change. Population growth and, as a result, consumption growth, creates additional threats and dictates the need to change approaches to consumption. The circular economy presents a multi-trillion-dollar economic opportunity. Shifting towards a circular economy model will not only deliver climate and other environmental and social benefits, but will also provide significant new and better growth opportunities (Prasek, 2022).

The future of the planet has become an objective concern of academic and political circles. One of the solutions is an immediate transition to a circular economy, which is not an easy process. The transition to a circular economy will not happen automatically (Schröder, 2020). Many recent studies point to the importance of the circular economy in achieving the Sustainable Development Goals (SDGs) (Valverde & Avilés-Palacios, 2021; Gubeladze & Pavliashvili, 2020; Gagnidze, 2018). This gives a broad scope for many areas of public policy (Lekashvili, 2022; Mikaberidze & Papahashvili, 2020). Although the circular economy is not directly mentioned in the SDGs or other relevant documents, it can contribute greatly to the achievement of these goals. National governments can support the transition to a circular economy by providing an overarching policy framework for all levels of government (OECD, 2020).

Even though several scientific studies are dedicated to the specific results of public policy for the transition to a circular economy, there is a gap in the systematic studies of the possibilities of the same policy. In this respect, analysis of the relevant scientific studies is most valuable. Our interest is how scientific research responds to these large-scale goals, though in this paper, we have limited ourselves to the issue of activation and thematic scalability of public policy opportunities for transition to a circular economy.

Policymakers usually make decisions based on wide-ranging information. We share the opinion that there is a great risk of information asymmetry in developing green policies, such as specific difficulties associated with the existence of big data and the

systemic perception of problems (Papachashvili et al., 2018). Considering the turbulent environment, review papers are also thought to have a timesaving purpose. As such, the given analysis of the scientific literature, and the summary analytical conclusions, in addition to defining the area of interest for further scientific research, will bring practical benefits to the relevant policy-making process.

The research question of our paper is: Which main goals are more reflected in the scientific research of the last two decades, and in the direction of which goals will it be useful to activate relevant research in this topic in the future?

2 Theoretical Background

The circular economy is wide-ranging and is of interest to academic circles. At the initial stage of this research, it was revealed that there are different understandings of what a circular economy is. Researchers point to ambiguity in the definition of "circular economy," and the challenges in measuring it, which in turn leads to difficulty in setting goals for the transition to circularity. Scientific studies are intended to help us understand ways to ensure circular economy policies are related to the conceptual understanding of the issue. In some countries, these policies are integrated into environmental, pollution, waste management and resource issues. While some scholarly work has been carried out on barriers to the development of a circular economy strategy (Talens Peiró et al., 2017), there are relatively few academic studies on policies that may accelerate the transition toward a circular economy (Hartley et al., 2020). Our analysis of circular economy articles showed us that researchers rely more on the definition established by the Ellen MacArthur Foundation (EMF). Policy-related scientific studies are more country-specific (The Circular Economy in Ireland, 2022), or sector-specific, and most of them share the same Foundation's proposed universal framework for transitioning to a circular economy. Considering critical analysis of the relevant works, we defined five universal public policy goals for the transition to a circular economy elaborated by the EMF as a theoretical guide for our scientific literature review. Naturally, the starting points for each country and each sector will be different, and local specificities will need to be considered, but the essence of the five goals and the need to establish coherence between policy efforts are universally important.

The mentioned objectives are: Stimulate a design for the circular economy; Manage resources to preserve value; make the economics work; invest in innovation, infrastructure, and skills; and collaborate for system change.

For an inclusive transition from a linear to a circular economy, the goals cover a wide range of activities (see the source EMF (2021), "Universal Circular Economy Policy Goals"), and an area of integrated actions is envisaged. In addition, it provides a framework for the implementation of common tasks for governments and businesses to achieve the goals of the transition to a circular economy through effective coexistence.

3 Methodology

A literature review was defined as the type of research. Descriptive qualitative research was conducted based on the scientific literature review, dedicated to the public policy opportunities for the transition to a circular economy. Among the systematic review studies developed on this topic, noteworthy is the work of researchers (Thiago et al., 2022) covering the years 2017-2021, with articles searched in the ScienceDirect and WoS databases, using the descriptors "Circular Economy and Policies." The sample consisted of 29 articles.

Our study was carried out based on the scientific database of EBSCO. "Academic Search Elite" was defined as a core resource for receiving the scholarly information. Peer-reviewed articles published in English-language academic journals were selected. "Transition to a circular economy" and "public policy, or government policy, or policy" were taken as search words. In the first stage, 2001-2023 was indicated as the search period, but as most of the works published in the given search direction come from 2015 and later, works published in 2015-2023 were determined for analysis. After automatic filtering, the initial number was 271. After matching the titles, abstracts, and keywords with the search thesaurus, 119 papers were selected for study. Analysis and synthesis of the main results/conclusions of the works was carried out. The results were grouped according to the Ellen MacArthur Foundation's five (1-5) universal areas of public policy, noted above. In addition, two groups were added: (6) articles that were not identified for only one purpose and included general policy recommendations, development of a general/unified framework, and circular economy action plans (including in the context of SDGs),

and (7) articles that reflected a results-comparative analysis, modeling, literature reviews, bibliometric studies, or meta-analysis - multiple interdisciplinary scientific studies addressing the transition to a circular economy.

The content of the articles, which dealt with various areas, was recorded in more than one public policy objective. A total of 149 entries were made[1].

4 Results

The thematic distribution of the selected papers according to the entries is given in Figure 1. The share of the individual thematic group is as follows: 24% (36) of entries cover the development of a general/unified framework for the transition to a circular economy, among which there are works that cover the mentioned issues in the context of sustainable development; about 23% (34) of entries reflect managing resources to preserve value, 14% (21) of entries cover stimulating circular economy design, 13.4% (20) of entries are dedicated to regulatory mechanisms for the economy, 10% (15) of entries refer to collaborative systemic change, around 7.4% (11) of entries cover issues such as investment in innovation, infrastructure and skills, and 8% (12) of the records of analyzed papers are of a literature review or bibliometric research type, which at the same time reflect the results of either a meta-analysis or a comparative study.

The second figure shows the distribution of emphases of scientific research articles according to the universal goals of public policy on the transition to a circular economy. The shares of analysis records are as follows: Stimulate a design for the circular economy – 20.8 %; Manage resources to preserve value – 33.7%; Make the economics work – 19.8%; Invest in innovation, infrastructure, and skills – 10.9%; Collaborate for system change – 14.9%.

[1] Due to the limitation of the scope of the article, the other relevant references are not presented in this work.

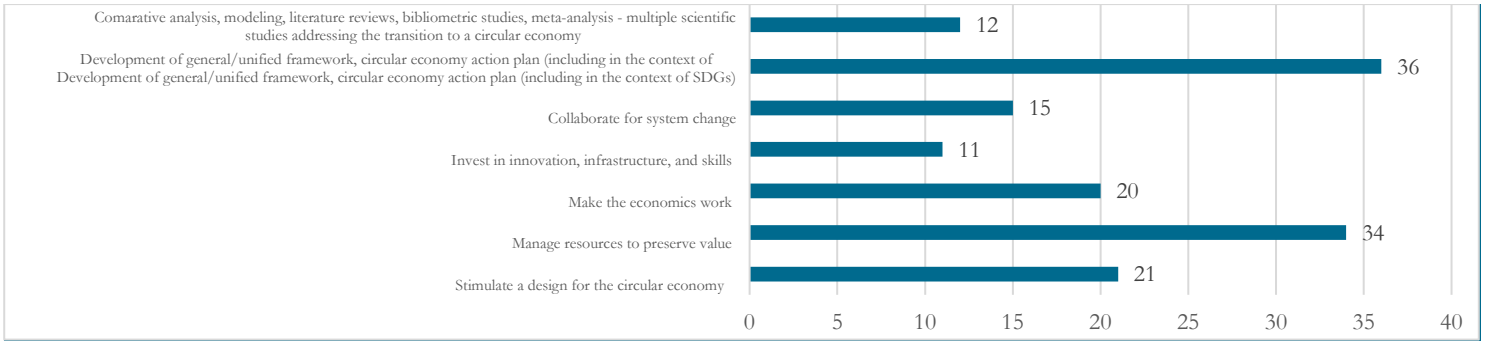

Figure 1: Quantitative distribution of scientific papers on public policy for the transition to a circular economy, EBSCO databases, 2015 - March 2023.

Source: Authors' illustration.

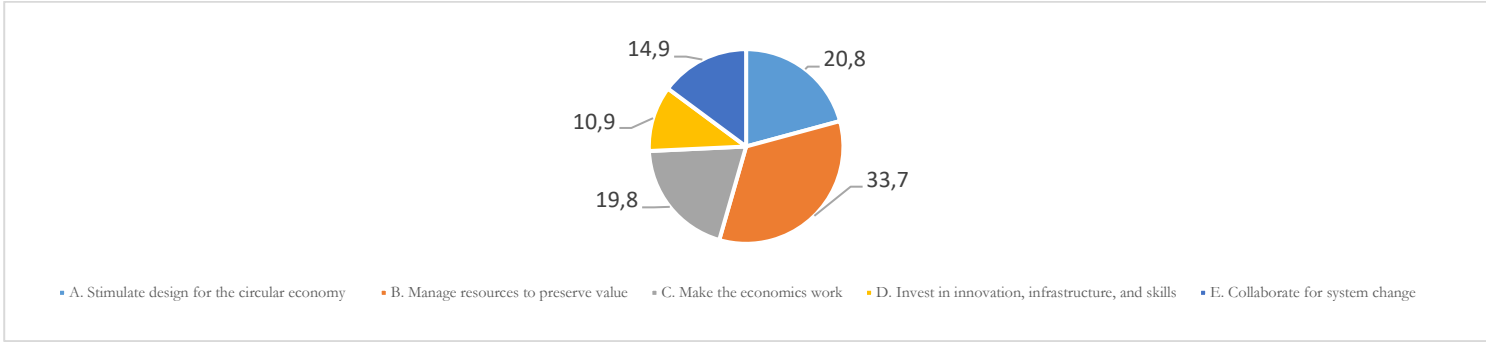

Figure 2. Emphases of scientific research according to the universal goals of public policy on the transition to a circular economy, %, 2015 - March 2023.

Source: Authors' illustration.

5 Discussion and Conclusion

The first stage of the study issue showed us that circular economy policies require a more adequate knowledge base and that science-based policies are needed to increase the efficiency of the transition to circularity. Public policy can encourage companies, remove barriers, and offer incentives for high material value reuse, efficient waste management, etc. Intensive integration of research results at the macro level will support systemic approaches. Public policy has ample scope to accelerate the transition to a circular economy.

From the beginning of the 21st century to 2015, the term "transition to a circular economy" was rarely used in our determined scientific base (EBSCO, journals in Academic Search Elite, peer-reviewed articles), although the content of the articles reflects this process and is mostly related to waste recycling.

Research in this direction became more active after 2015, presumably connected to the UN General Assembly resolution 70/1 – Transforming Our World: The 2030 Agenda for Sustainable Development.

The special emphasis of scientific studies (24%) on an action plan and unified framework for the transition to a circular economy is related to the period after the adoption of the mentioned resolution. These studies contain many useful recommendations for policymakers, especially as almost all studies are aligned with one or another goal of sustainable development.

Comparative studies of the transition to a circular economy in different countries provide unique opportunities to share the achieved progress for effective public policy, while literature reviews and bibliometric studies provide a unique opportunity for both policymakers and researchers to quickly familiarize themselves with the results achieved in this field. This focus on such studies was seen in 8% of the studied papers, indicating the need for further academic research.

Outcomes of reviewing the literature on the transition to a circular economy, according to the universal objectives of public policy, clearly highlight a special scientific interest in research into business models related to the management of resources to preserve value (33.7%). There is approximately equal research interest

in circular economy stimulation and promotion systems (20.8%) and proper regulation of the economy (19.8%).

Issues of effective multi-stakeholder collaboration (14.5%) and issues of investment in innovation, infrastructure, and skills in the context of public policy (10.9%) have been relatively less in the focus of scientific research, and, as such, these future scientific research directions are promising.

Six of eleven articles related to innovations were related to digital transformation. Roblek and co-authors (2020) proposed interesting conclusions for expanding this research area, emphasizing the importance of scientific innovation with the conceptual, technological, and contextual frameworks of the Internet and Internet technology usage, and its impact on sustainable development and the emergence of Society 5.0.

The intensive use of digitization advances for the transition to circularity is important for both the public and private sectors, and obviously provides a wide arena for scientific research. Within the framework of this study, the direct research focus was not the correlation of raising the level of knowledge about the field of education and circularity, although observation of this direction during the review process also revealed the scarcity of scientific studies in this regard. Only two papers of those studied focused on the role of education, which is also worth noting for future research.

The contribution of this paper to scientific novelties lies in the systematization of scientific research emphases, according to the universal public policy goals, for the transition to a circular economy in the last two decades. In addition, a study of bibliometric and literature review scientific articles related to the issue was carried out. The results of this research offer new findings for the academic community.

The limitation of the work is the determination of the study area to the scientific research papers found in the EBSCO database, sought in the direction of academic research. The conclusions are derived from analysis of the studied scientific works.

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Individual Differences and Job Attitudes in the Function of Increasing Organizational Citizenship Behavior (OCB): A Case Study

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Abstract This paper analyzes the link between individual differences and job attitudes with organizational citizenship behavior (OCB) that contributes to the increasing success of the organization. Employees who have more experience helping new employees contribute to increasing their productivity, thus increasing the overall efficiency of the workgroup. The paper also presents research results from Croatia's selected company that deals with the hospitality industry, where semi-structured interviews consisting of 16 questions were conducted with the respondents. The questions were thematically related to respondents' knowledge and attitudes about OCB in general, then to respondents' experiences and attitudes about the impact of individual characteristics and attitudes towards work on OCB practice and employees' attitudes about the impact of OCB on business performance. Research results indicate that employees practice the concept of OCB to a much greater extent than they theoretically understand it. In addition, the research results showed that not all individual differences and job attitudes are equally associated with OCB. Knowing how to increase the level of OCB in the company implies the increased business performance of the organization, which is why this paper has theoretical and practical importance in business.

Keywords:
individual differences, job attitudes, organizational citizenship behavior, business success, case study

JEL:
J24, M14

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1 Introduction

Today's competitive work environment is increasingly demanding due to significant changes in technology and customer habits, substantial changes in the environment caused by global changes and relations between countries, and other disturbances such as the recent COVID-19 pandemic. In modern organizations, it is necessary to pay close attention to organizational members' spontaneous and cooperative behavior, particularly organizational citizenship behavior (OCB), as this can be the critical factor in gaining a competitive advantage (Mackenzie et al., 2011). Coldwell and Callaghan (2014) found that OCB plays a vital role in the development and success of organizations by initiating various workplace dynamics, promoting social connections in organizations, and influencing behaviors related to organizational functions and outcomes.

2 Theoretical Background

2.1 OCB model and its implications in business systems

Organ (1997:91) defined OCB as behavior that contributes "to the maintenance and enhancement of the social and psychological context that supports task performance". The three-dimensional OCB model proposed by Coleman and Borman (2000) consists of 27 dimensions shaped into an integrated OCB model. The model encompasses three broad dimensions that differ concerning which entity benefits from responsible employee behavior (Coleman and Borman, 2000):

1. *Interpersonal citizenship performance* refers to interpersonal conscientiousness in helping organizational members (suggestions, study, direct execution of tasks, providing emotional support, etc.).
2. *Organizational citizenship performance* contains the concepts of loyalty and satisfaction of the organization by accepting, supporting, and protecting the organization's goals, as well as following organizational rules and procedures.
3. *Job/task citizenship performance* refers to investing additional efforts to perform work tasks as successfully as possible, maximize employees' work performance, and develop personal knowledge and skills to increase personal productivity and commitment to work.

According to the theory of social exchange proposed by Blau (1964), employees reciprocate to the organization with OCB when they perceive that the organization treats them correctly (Cardona et al., 2004). Through the process of social exchange, employees spontaneously express OCB patterns due to job satisfaction, loyalty, trust in the organization, and perceptions of organizational fairness (Cho and Johanson 2008).

The basic definition of OCB suggests a positive correlation between OCB and organizational performance (Organ, 1988) by increasing employee and managerial productivity, which leads to increasing the overall efficiency of the workgroup, additional time for strategic planning, improving business processes, and freeing up organization resources for more productive purposes. Furthermore, coordination of activities between employees increases team spirit, morale, and cohesion, thus reducing the need to spend team members' time and energy on maintaining group functionality (Organ et al., 2005), but also by contributing to a comfortable work environment that raises morale, group cohesion, and a sense of belonging to a group (George & Bettenhausen, 1990). OCB also improves the organization's ability to adapt to environmental changes when employees actively monitor market trends (loyalty) and participate in meetings (civic virtue). Also, employees willing to take on new responsibilities or learn new skills show elements of cordiality, thereby increasing an organization's ability to adapt to changes in the market (Organ et al., 2005). Finally, employee OCB can improve organizational performance by creating different forms of organizational social capital by improving information transfer and performance (structural form), gaining useful knowledge by attending business meetings (cognitive form), and building mutual trust (relational form) (Bolino et al., 2002).

2.2 The impact of selected individual differences on OCB

Research has shown that biographical characteristics play a significant role in understanding workplace behavior (Wanxian & Weiwu, 2007). Age is the most apparent variable by which individuals differ, with older employees more likely to perceive OCB as behavior within a work role (Stroshine and Brandy, 2011). Seniority also has a positive effect on OCB, with the Hunt (2002) study finding that the relevant skills and competencies needed to do job growth with a longer stay of employees in the same organization. Some of the basic behaviors in the workplace

are proper business communication, self-awareness, and self-control of employees, which are influenced by emotions and moods or the emotional state of employees (Ekman, 1992). Organizations encourage organizational behavior aimed at helping and cooperating among employees as a determinant of OCB (Hudrea, 2006).

2.3 The impact of attitudes towards work on OCB

Job satisfaction affects employee productivity, absenteeism, employee turnover, and responsible organizational behavior (Coomber and Barriball, 2007). Research has shown that less satisfied workers are more likely to seek other jobs or reduce workplace engagement (Mirković, 2016).

Preoccupation with work can lead to positive outcomes such as commitment, care, attention, immersion, enthusiasm, self-image and self-esteem (Sharma et.al., 2012). However, the cause-and-effect relationship between preoccupation and activities and behaviors is unclear.

Organizational commitment is based on three factors: firm belief and acceptance of organizational goals and values, willingness to make significant efforts on behalf of the organization, and a strong desire to remain a member for as long as possible (Mowday et al., 1974). A 1977 study showed that commitment to an organization results in employee behavior not conditioned by penalties or rewards (Wiener, 1982).

Organizations provide employees with emotional and economic benefits to create a positive perception of support and respect, encouraging them to reciprocate by increasing their effort and commitment in the workplace and tasks not formally given job descriptions (Baran et.al., 2012).

Employee involvement is emotional and intellectual devotion to the organization or effort a person puts into work (Saks, 2006). Erickson (2008) found that engaged individuals have a high propensity for behaviors as defined in the literature by OCB.

3 Methodology

A survey was conducted to gather employees' experiences and attitudes about OCB in an organization that deals with the hospitality industry. The research aims to examine and analyze the construct of OCB on a deliberate sample and based on the elaboration of the relationship between the selected variables to determine the relationship between employee preferences of OCB with business performance.

The research is planned to answer the basic research questions:

- Are the employees of the selected business entity at all familiar with the concept of OCB?
- Do individual differences affect the employee's preference for OCB in the selected business entity?
- Does the attitude towards work affect the employee's preference for OCB in the selected business entity?
- Does the concept of OCB affect the performance of the chosen business system?

The research was conducted in a medium-sized catering facility from Varaždin County in Croatia on an illustrative sample of five employees who differ in their characteristics, job positions, and other characteristics. A semi-structured interview consisting of 16 questions was conducted with the respondents. The qualitative data analysis was conducted without computer software and identified open codes and categories that follow basic research questions using initial, focused, and axial coding and the method of grounded theory.

4 Results

Detailed analysis of respondents' answers regarding the concentration of knowledge versus the tendency to practice OCB revealed a higher tendency toward OCB in practice, as shown in Table 1.

Table 1: Results of the study of the difference in knowledge and practice of OCB

Examined area	Main findings		Explanation
Concentration of knowledge	**Low concentration of knowledge**		
	☑	Helping behavior, cordiality	OCB → is not behavior within the work role
	😐	Loyalty, adjustment to the organization	
	☒	Individual initiative, civic virtue, personal development	
Tendency to practice OCB	**High tendency to practice OCB**		
	☑	Helping behavior	Quality and timely performance of work tasks
		Loyalty	Pride, gladly sharing successes
		Adjustment to the organization	Compliance with rules at all times
		Personal development	Non-formal learning → improving skills and business processes
		Individual initiative	Enthusiasm in doing work, voluntary acceptance of responsibilities
	☒	Cordiality	Approaching problems calmly when being respected
		Civic virtue	Attending ineffective organizational meetings

Source: Authors' research

By analyzing the research results on the impact of individual differences on OCB, we identified three levels of impact: significant, medium, and low, which are shown in Table 2.

Table 2: Research results on the relationship between individual differences and OCB

Variable	OCB indicator	Implication
Biographical characteristics		
Age	Reciprocity mechanism, decreased ability	Helping behavior
Length of service	Number of years in the same job	Organizational commitment
Sex	Gender characteristics	Stronger tendency of women to OCP
Personality	Comfort, conscientiousness, emotional stability	Helping behavior, kindness
Emotions and moods	-	No implication
Learning	Informal level	Helping behavior, cooperation

Source: Authors' research

The analysis of the research results on the impact of attitudes toward work on OCB found that job satisfaction affects work behavior, obsession with work affects OCB, commitment to the organization benefits OCB, employee engagement infuriates OCBs, and perceived organizational support has no impact on OCB.

From the collected answers from the respondents, we can conclude that OCB has numerous positive implications for business success, shown in Figure 1.

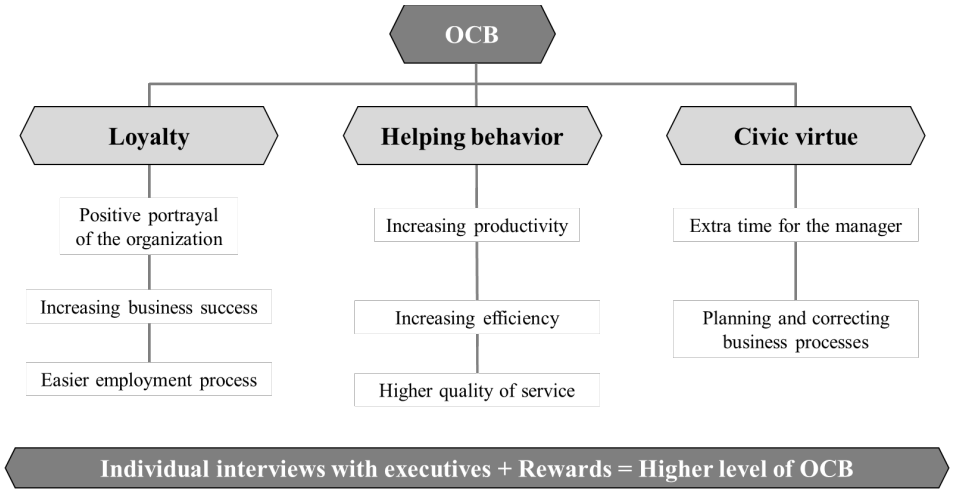

Figure 1: Research results on the relationship between OCB and business success
Source: Authors' research

5 Discussion and Conclusion

Although there are many types of research related to OCB, business practice shows that the application of OCB is still insufficiently applied. Therefore, the primary motive for this work was to promote the concept of OCB further and explore the extent to which this concept is recognized and used in concrete business practice.

There are some limitations regarding this research, primarily referring to a small research sample and the fact that research is conducted within one specific kind of company within a specific industry. Therefore, in future research, it would be reasonable to expand the sample to several organizations within culturally different regions to compare results and determine if there are significant differences.

The results of this article have scientific and practical applications. Given the growing demand for employees in service industries, especially in the hospitality industry, the results can be a guideline for conducting individual surveys of hospitality facilities to identify potential difficulties among current staff. Also, research results are helpful for managers because they indicate the diversity of employees concerning age, experience, personality, and attitudes towards work and can be guidelines for choosing educational programs or programs to strengthen team spirit in order to finally improve the behavior of their employees, and enhance effectiveness in general. Managers need to be aware of the diversity of employees to be able to affect behavior by implementing modern leadership strategies, while effective leadership can contribute to the development of greater OCB.

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ENERGY SALES FORECASTING IN A SUSTAINABLE DEVELOPMENT CONTEXT: BIBLIOMETRIC REVIEW

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Abstract This paper aims to present different patterns of keyword evolution and their co-occurrences in publications dedicated to energy sales forecasting in a sustainable development context, and indexed in the Scopus and Web of Science Core Collection (WoS) databases. The adopted method is the Structured Literature Review (SLR) variation method with queries supported by the Bibliometrix software as the analytical and visualisation tool. The number of publications has evolved in the context of indexed keywords, which are related. Research on energy sales forecasting and sustainability has earned considerable attention in multiple academic fields. Proposed queries syntaxes and searching procedures in Scopus and Web of Science databases present limitations related to the subscription of these databases and the interchangeability of syntaxes. The novelty of this study is based on the results and their presentation with the usage of Bibliometrix as a tool for the exploration of two independent scientific areas, namely energy sales forecasting and sustainability, and the presentation of connections between them. This paper can inspire researchers to develop the subject of energy sales forecasting evolution in a sustainable development context, as well as business practitioners interested in energy sector adaptation visible in keyword changes in their decision-making processes.

Keywords:
bibliometric analysis, energy carriers, sales volume, sustainability, thematic evolution

JEL:
C53, O13, Q001

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1 Introduction

In a dynamically changing economy, there is growing interest in the issues of Sustainable Development (SD). SD has become a well-known idea in the scientific literature influencing the activities of all economic sectors, and in particular the energy sector which fuels the economy of each country. The development of modern economies and society as a whole depends on electricity and requires its supply. The issue of energy security, on which its functioning and development depend, is also strategic for every country. Therefore, there is scientific literature, business reports and publications oriented not only on economic aspects, but also on social and environmental matters of interest. The energy industry, however, is also a sector of the economy with one of the most harmful impacts on the environment.

The aim of this paper is to explore the scientific literature, indexed in the Scopus and Web of Science databases, dedicated to the energy carriers and resources sales forecasting, which is anchored in the SD perspective. Analysis of the scientific literature can reveal the patterns and methods of the energy carriers sales forecasting. Therefore, the adopted method in this research is a bibliometric study (Nazari et al., 2021) as a variation of the Systematic Literature Review (SLR) based on the databases' research queries, developed in bibliometric maps with the use of the Bibliometrix program, version 4.0.1 (Aria & Cuccurullo, 2017).

This scientific paper has a classic structure, and presents the theoretical introduction and then materials and methods. In the same section, research gaps are highlighted along with the research approach and assumptions. Then, the results and their interpretation are presented in the third section. Discussion of the results and a conclusion constitute the fourth and fifth sections respectively. In this study, the limitations of the conducted research were discussed and presented alongside possible new research avenues for future studies.

2 Theoretical Background

Countries are taking steps to reduce the damaging effect of the energy sector on the environment by integrating energy policy with environmental policy. Therefore, the industry is slowly shifting from electricity generation from traditional sources to

renewable energy sources. Until recently, the majority of companies carried out their activities in order to achieve competitive advantage (Niemczyk et al., 2021). Changing social expectations have challenged the current model of business thinking about the management of natural resources. Their usage reduction, recycling, reuse and redesign became important parts of decision-making processes in modern business (Moreno-Mondéjar et al., 2021). More enterprises have begun to perceive and implement social and ecological activities, treating the environment as a kind of stakeholder in implementing the concept of SD. All organisational processes are influenced by the energy carriers sales forecasting, and relations between supply and demand, whose understanding is crucial for achieving Sustainable Development Goals (SDGs) (Bohanec et al., 2017; Kaleta et al., 2018). Therefore, the bibliometric review results presented in this paper can be valuable for researchers, managers and policy-makers interested in the energy sector and energy carriers sales forecasting. The presented method can be useful for all those interested in the subject evolution represented by the analysed keywords and scientific areas. Also, the energy sector itself has to address a challenge of transformation to achieve the 7th SDG, namely to 'ensure access to affordable, reliable, sustainable and modern energy for all' (United Nations, 2022). This specific SDG is a common point for the subjects of energy sales forecasting and sustainability, which concern this paper.

3 Methodology

The Scopus and WoS multidisciplinary scientific databases were examined. These databases contain peer-reviewed books, journal articles, conference proceedings etc. This research uses the SLR variation method with queries (Table 1). Publications are listed by query syntax. Scientists using bibliometric software analyse those publications. This study used Bibliometrix, a less popular research software, in order to analyse SLR results. Bibliometrix has more features for bibliometric and in-depth scientific literature analysis. Bibliometrix is preferred over other bibliometric programs because it supports original query syntaxes with keywords to improve query results and has developed the option of graphical presentation of analyses.

This paper uses bibliometric SLR to study energy sales forecasting in (Visser et al., 2021). This paper does not detail the SLR procedure. The SLR method used the original set of queries to create a comprehensive and similar query syntax for each database. Query syntaxes affect the quantity and quality of results (Table 1), which

Bibliometrix analyses. The query order shows the database exploration steps with the accuracy of Bibliometrix's autocorrection. The popularity and trust placed on those databases among researchers were primarily the reasons behind their choice. The literature collected in those databases consists of peer-reviewed publications organised as digital collections of books, journal articles, conference proceedings etc.

Table 1: Queries used in the Scopus and Web of Science exploration on 27 December 2022

No.	Query syntax	Number of analysed files	
		WoS	Scopus
1	TITLE-ABS-KEY (("renewable energy" OR "natural resources" OR "energy carriers") AND (sales OR volume OR quantity) AND (forecast* OR predict*) AND sustainab*)	421	306
2	TITLE-ABS-KEY (("renewable energy" OR "natural resources" OR "energy carriers") AND (sales OR volume OR quantity) AND (forecast* OR predict*) AND sustainab*)[1]	181	235

Source: Authors' elaboration.

Table 1 shows quantitative differences between the WoS and Scopus databases on 27 December 2022. The query syntax and keywords of these two scientific literature collections affect the results. No rule indicates that one database is a subset of another based on result numbers. Thirty-five Scopus and WoS publications overlapped (Visser et al., 2021). Scopus and WoS cover documents differently. WoS has 181 documents relevant to query 2 and Scopus 235. In query 2 (Table 1), scientific interest areas were chosen to explore only relevant publications on energy sales forecasting in SD.

3 Results

Each set of query results for the two databases (Table 1) were merged, analysed in the Bibliometrix software and presented in graphical format. There is a visible evolution of the energy sales forecasting in the SD perspective visible throughout the main periods (Figure 1). Despite the query syntax and structure, among the

[1] Query 2 was limited by selected "categories" in WoS (Energy Fuels; Green Sustainable Science Technology; Materials Science Multidisciplinary; Engineering Environmental; Engineering Multidisciplinary; Management; Business; Mathematics Applied; Business Finance; Computer Science Artificial Intelligence; Computer Science Information Systems; Economics) and selected "subject areas" in Scopus (Environmental Science; Social Sciences; Business; Management and Accounting; Computer Science; Mathematics; Economics, Econometrics and Finance; Multidisciplinary).

results in Figure 1 there are no "forecasting" or "modelling" keywords. The first period covers years 1992–2008 and contains four keywords: "sustainability", "computer simulation", "sustainable development" and "eurasia", in the original form generated by Bibliometrix automatically. Those keywords influence another period of the subject of energy sales in the sustainability context covering the years 2009–2013. In these years, new keywords, such as "power", "generation", "agriculture" and "photovoltaic" joined the previous keyword collection (Figure 1). Another stage of evolution in the researched subject is characterised by period 2014–2023, where new keyword merges constituted another set of keywords, for example the new "performance" keyword. The "renewable energy" keyword merged in this evolution on the basis of "sustainable development", "agriculture", "land use", "life cycle" and "forestry" with "empirical research". Figure 1 presents the analysis of query 2 results, related to the energy sales forecasting in the sustainability context, the subject of the bibliometric review. Keyword evolution in this context is characterised by the snowball effect, in which both new keywords are added to the previous period, and new keywords are proposed by the Bibliometrix software (Bran et al., 2021). The program displays results in accordance with existing and future directions of scientific interests presented in the publications.

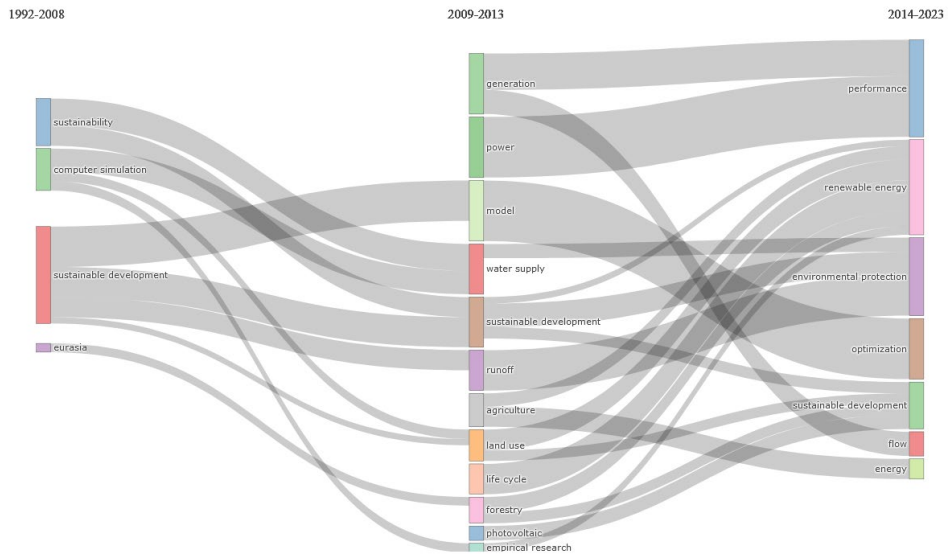

Figure 1: Thematic evolution of merged Scopus and WoS databases for query 2 results
Source: Authors' elaboration in Bibliometrix Software version 4.0.1.

Figure 1 shows most keywords in 2009–2013. The Bibliometrix software divided the time span into periods. As shown, SD and related topics are crucial to keyword evolution. "Performance" and "Optimization" are management science keywords. Bibliometrix created Figure 1. Thematic evolution parameters: 250 words minimum, 6. weight index was 0.1, inclusion index weighted by word-occurrences, clustering algorithm was Walktrap, which is important for Bibliometrix. Time slices: 2 cutting points, 2008 start year, 2013 stop year.

Figure 2 shows another Bibliometrix evolution analysis. The authors excluded two keywords from the analysis of Bibliometrix results as shown in Figure 2, in order to focus on the most related keywords to improve readability. "Sustainable development" and "article" were those keywords (grey colour in the legend of the chart). Figure 2 shows the similar phases (temporal parallelism of curves) of interest in energy sales forecasting since 1992. Figure 2 shows cumulative characteristics in each coloured keyword in the figure legend. Field was Keyword Plus, occurrences were cumulate, and words were 10. Clarivate's Keywords Plus algorithm uses words or phrases that frequently appear in an article's references but not in its title.

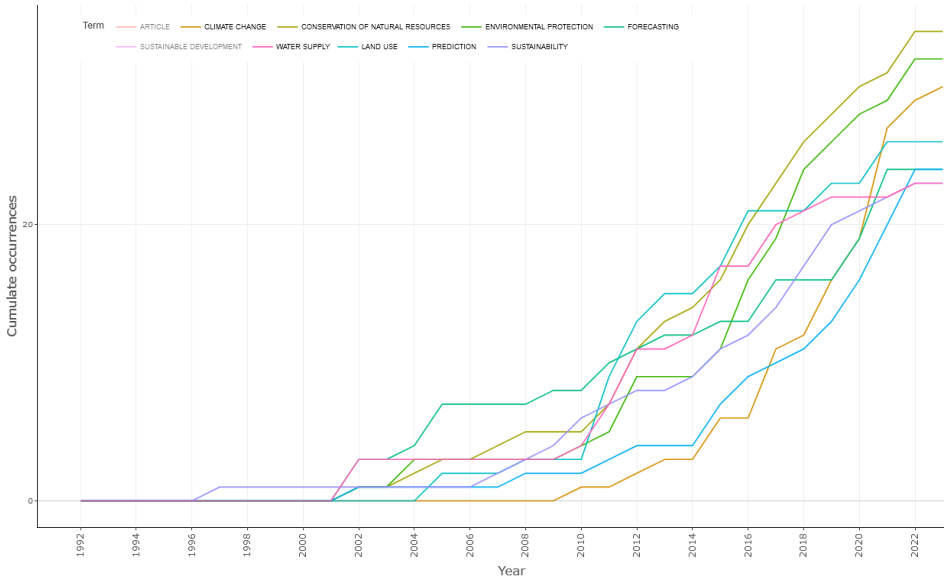

Figure 2: Thematic evolution of merged Scopus and WoS databases for query 2 results

Source: Authors' elaboration in Bibliometrix Software version 4.0.1.

As shown in Figure 2, keywords overlap in the subject evolution, demonstrating the interrelationships between energy sales forecasting and SD.

Figure 3 shows the keyword co-occurrence map of Bibliometrix's Keyword Plus algorithm. The bibliometric map's nodes (coloured dots) are keywords co-occurring in scientific publications represented by the edges (lines). Keyword clusters are coloured automatically by scientific field (Figure 3). Bibliometrix found "forecasting" in the red econometrics cluster. "Sustainable development" in the second largest red network is crucial. The blue cluster in Figure 3 contains keyword group studies on "conservation of natural resources" in nature. The green cluster is agriculture and bioresources. The fourth, violet cluster keywords contain mathematical operations. Thus, sustainable energy sales forecasting requires business, mathematics and agriculture. In the keyword co-occurrences bibliometric map (Figure 3), network layout was automatic and clustering algorithm was Louvain, normalisation in association procedure, repulsion force was 0.2, number of nodes was 31, minimum number of edges was equal to 4, remove isolated nodes field was "yes," and node colour by year was deselected. There are 31 nodes and 4 edges, isolated nodes field were deselected, node colour by year was deselected.

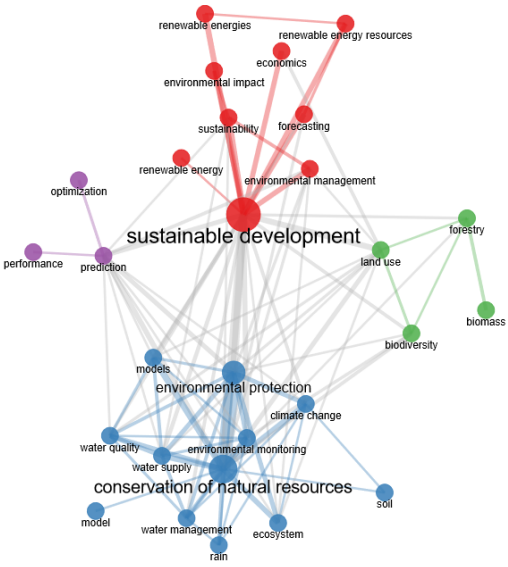

Figure 3: The bibliometric map of keyword co-occurrences based on merged query 2 results
Source: Authors' elaboration in Bibliometrix Software version 4.0.1.

The three keywords were removed from the bibliometric map in Figure 3 to enhance the quality and readability of the results (Aria & Cuccurullo, 2017). This is standard procedure. The first keyword to be removed was "energy efficiency". It was deleted from the red cluster due to its exceedingly long distance from the other nodes. The second keyword to be removed was "article" from the blue cluster. The third was the "china" (original form proposed by Bibliometrix) keyword located also in the blue cluster. This keyword was removed because country comparison is not within the aims of this paper. It is also good practice in bibliometric research to remove all names of countries, organisations or geographical objects.

3 Discussion

Despite the query used, there were no nodes in Figure 3 representing energy sales forecasting. There were some identified, however, among the specific results presented in bibliometric maps and similar analysis related to energy sales forecasting. Those keywords were searched in raw results to generate Figure 2 and were transformed into a tabular form in Bibliometrix. The occurrences of keywords "sales" and "forecasting" were identified 8 and 24 times respectively. "Sales" and "forecasting", however, are not among the most frequent words.

The problem of searched keyword identification is either caused by the query syntax or the rarity of those words in the examined databases. These results should be checked against another popular bibliometric software, i.e. VOSviewer. Technical problems, however, can be encountered while importing the data in a compatible format for the VOSviewer software. Although the field of sales forecasting was identified, there is no investigation of forecasting methods or prognosis models. The aim of this article to explore and present keyword evolution in the subject of energy sales forecasting in the SD context was achieved.

5 Conclusions

The energy carriers sales forecasting (including fuels) in the context of SD is important for understanding the processes of energy transition (shift from fossil fuels to renewable and green fuels) and achieving SDGs in the energy sector. The bibliometric analysis illustrates the evolution of this process in the scientific literature, by the presentation of the most significant keywords. The scientific

contribution of this article lies in its provision of a general pattern in the form of a diagram of the evolution of keywords (Figure 2). In the future, in-depth bibliometric research combined with SLR can consider the general pattern of the sales forecasting method, which can be specific to renewable and non-renewable energy sources. Further research will focus on selected types of energy carriers: liquid fuels, gas and coal.

Predicting energy sales can be useful for the management processes of a company. It can help managers plan inventory, set prices and make decisions about staffing and marketing. Additionally, accurate energy sales predictions can help managers identify trends and respond to changes in the market, which can ultimately improve the overall performance of the business. Energy sales forecasting is important for businesses in the SD context because it allows them to plan for future energy demand and make informed decisions about investments in renewable energy sources and energy efficiency measures. This can help businesses to reduce their environmental impact and become more sustainable, while also potentially reducing costs and increasing profits. Additionally, accurate energy sales forecasts can help businesses to comply with regulations and policies related to energy use and emissions.

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Overview of Emission Calculators to Support Transport Sustainability

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Abstract The increase in both passenger and freight transport has been enormous during last years and the situation will not change in the near future. This growth can be attributed to many factors, such as the increase in global trade or the rise of e-commerce which led to more goods and cargo movement and the amount of passenger traffic in all modes of transport. The consequence is increasing emissions, resulting in massive environmental degradation. Emission calculators are used to estimate the amount of greenhouse gases that are emitted into the atmosphere from various sources. They help better understanding of the process of emission formation to take steps to reduce them. This article's aim lies in comparing available free emission calculators in transport. The comparison is oriented on various transport modes, input and output parameters, and methodologies used to calculate emissions. On the basis of this research review own emission calculator has been designed.

Keywords:
greenhouse gas emissions, emission calculator, freight transport, sustainability in transport, SDGs

JEL:
Q56, L86

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1 Introduction

Everybody knows that global warming and the increase of greenhouse gas emissions (GHGE) aspires to one of major problems facing global society. Several scientific studies describe and analyze relationships among various emission sources, air pollutant concentrations and human health (Rahman et al., 2022). One of the most significant sources of pollution is the transport sector. It is considered to be the second largest contributor to global pollution after industry (Rungskunroch et al., 2021) which produces almost the half of all GHGE. And its share is still growing (Saboori et al., 2014). The negative influence on environment which comes from the transport sector has two basic reasons – the improperly designed infrastructure and the harmful impact of traffic itself (Danish et al., 2018). Nowadays, there is a growing inclination towards improving the effectiveness of traffic while simultaneously minimizing its adverse effects. Among the concerns pertaining to the environment, the emission of greenhouse gases, particularly carbon dioxide, is the most widely debated issue.

In this paper, the comparation of available free emission calculators is described. The emphasis lies on using of various transport modes, the data entered and produced, and the approaches utilized for determining emissions. Based on this research analysis, a customized emissions calculator has been developed.

2 Theoretical Background

Most developed countries have prioritized reducing greenhouse gas emissions, with a focus on carbon dioxide, as a key environmental goal (Wadud et al., 2019). Carbon dioxide is the most detrimental greenhouse gas, and even a small increase in its concentration can cause breathing problems for humans (Natr, 2006). Over time, exposure to high levels of CO_2 can lead to severe health problems and even death.

In order to be able to reduce GHGE, we must first have and use detailed monitoring and evaluation of their quantity. In 2012, the European Committee for Standardisation has set the standard EN 16285 – Methodology for the calculation and declaration of energy consumption and greenhouse gas emissions of transport services (freight and passengers) (Petro & Konecny, 2017).

There are three main approaches defined how to measure energy consumption and produced CHGE. Well-to-Tank (WtT), Tank-to-Wheel (TtW) and Well-to-Wheel (WtW) (CSN EN 16258, 2012):

- Well-to-Tank – indicates the amount of consumed energy and produced CHGE during all activities from the extraction of raw materials through the production of energy or fuel, up to the delivery to the distribution network, from which the transport means takes their fuel or energy.
- Tank-to-Wheel – energy consumption and GHGE production associated with the operation of the transport means.
- Well-to-Wheel (the sum of Well-to-Tank and Tank-to-Wheel): An approach monitoring the energy consumption and GHGE production which covers the whole lifecycle from the retrieving and production of electricity or fuel, through its way over the distribution network, to the consumption associated with the operation of the transport means.

3 Methodology

These approaches, together with a systematic literature review and qualitative content analysis, were the basis for developing the review of available emission calculators. At the beginning of the research aimed at creating a review of freight transport emission calculators, the method of systematic literature search was used. This method is a well-structured and rigorous approach that consists of steps to identify, evaluate, and synthesize the findings of various research studies, academic papers, and practitioner reports. These steps typically include selecting the relevant research areas, identifying appropriate sources of information, defining specific search terms and criteria, conducting a thorough and systematic review of the selected literature, synthesizing the results using a pre-defined methodology, and producing a descriptive review of the findings (Fink, 2014). Then the method of content analysis is used as a research technique for making valid conclusions from expert articles or other meaningful sources in the context of their use (Krippendorff, 2003).

The method of qualitative comparative analysis is used to compare the freight transport emissions calculators obtained using the method of a systematic review. This method explores causal relationships between observed parameters by

systematically comparing them in order to find combinations of conditions that lead to the desired outcome, the minimization of which can explain the phenomenon under study (Fang-Yi et al., 2020). In this case, the inputs, outputs and emissions calculator's methodologies were compared and significant parameters were found. The key questions that formed the basis of the literature review were: What are the most common parameters of transport emission calculators? Is the methodology used by emission calculators sufficiently described? Does the methodology use standardized WtT, TtW and WtW metrics?

4 Results

Most of the emissions calculators analyzed in this study shared a similar set of basic input data, such as the starting and ending points of the transport, distance or way of transport (one-way / reverse two-way). Additional input data, when available, are typically dependent on the weight or volume of the cargo. Some calculators offer the option to input more specific data like orientation or fragility of the cargo, gross / net weight, option of special containers etc. In terms of output data, all the calculators provide information about CO_2 emissions, though the units used by each calculator varied. Some calculators also offered additional output data such as energy consumption, the amount of other pollutants such as CO, HC, NO_x, SO_x, NMHC or particles emitted during the transport, or even the possibility of offsetting emissions through carbon credits or similar mechanisms.
The final selection included five emission calculators:

1) EECA Business – CO2 emission calculator (EECA Business, 2023)
2) ClimateCare – Business CO2 emission calculator (Climatecare, 2023)
3) EA Logistics – Freight Emissions Calculator (EA Logistics, 2023)
4) EcoTransIT World – Calculation (EcoTransIT, 2023)
5) Canadian National Railway company – Carbon Calculator (Canadian National Railway company, 2023).

When selecting the features of the calculators, the requirements of a significant car manufacturer in the Czech Republic were also considered.

Table 1 presents the overview of emission calculators with specified parameters.

Table 1: The overview of emission calculators with specified parameters

No.	Road Transport	Transport of FMPC and/or Material	Own Vehicle	One-Way / Round Trip Transport	Total and Average Emissions	WtW, WtT and TtW Approach	Monetization of Produced Emissions
1	Y	NA	NA	One-way only	Total only	NA	NA
2	Y	NA	NA	One-way only	Total only	NA	Y
3	Y	NA	NA	One-way only	Total only	NA	NA
4	Y	NA	Y	Y	Total only	Y	NA
5	Y	NA	NA	One-way only	Total only	NA	NA

Notes: FMPC – finished manufactured passenger cars, WtW Well-to-Wheel, Wt T Well-to-Tank, TtW Tank-to-Wheel, Y Yes, N No, NA not available
Source: Author's research.

A comprehensive tool capable of calculating emissions for multimodal transport was not identified. If necessary, the transportation must be divided into different sections based on the various modes of transport and the emissions calculation must be counted for each individual section separately. Then, total emissions are obtained as a sum of section emissions. This can be a time-consuming and complex process, but it may be necessary for accurate emissions calculations for multimodal transport.

5 Discussion

After evaluation of selected freight transport emission calculators, the EcoTransIT World calculator (No. 4) was recommended for extensive usage. It is the most comprehensive of followed tools. It can be used to calculate emissions not only from road freight transport, but also from rail, air and sea transport. The EcoTransIT World calculator also allows a significant number of input parameters and generates a large amount of output information. The calculator uses a distribution of output emissions into WtW, WtT and TtW. The methodology used is also transparent (EcoTransit, 2023)

Most of the other analyzed freight transport emissions calculators are available only for one mode of transport (usually road or air); some calculators do not have a transparently specified methodology for calculating emissions. Calculators often don't allow the specification of more than trivial input parameters and/or don't distinguish between WtT, WtW, TtW approaches, which is also a disqualifying restriction for them.

A common problem lies in the lack of support for multimodal transport. Emissions have to be calculated separately for each mode of transport (road, rail, air, sea, etc.).

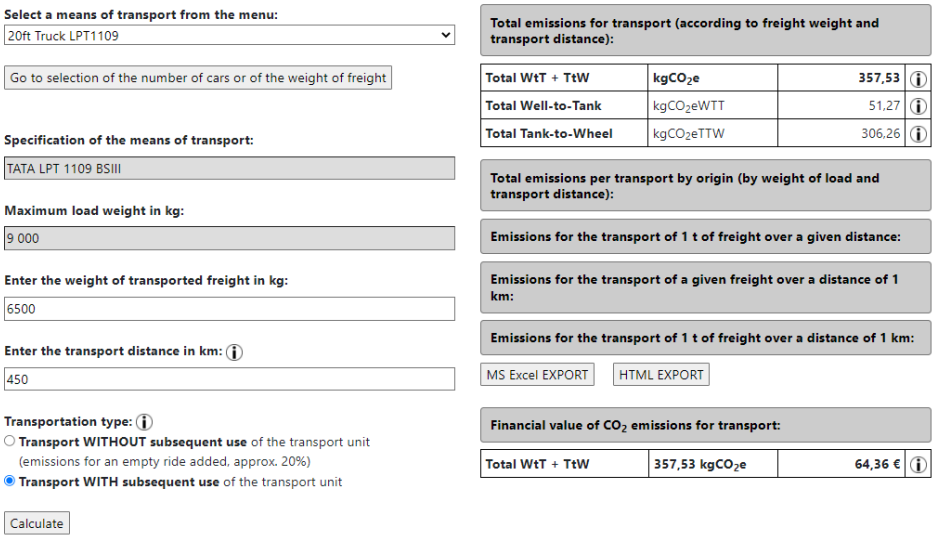

Figure 1: KALOGEMIS GHGE calculator, actually used in India
Source: Machalík (2023).

The limitation of this research is constrained by the quantity of analyzed emission calculator, given that solely eighteen such calculators (identified through Google) were scrutinized. Nonetheless, it is reasonable to speculate that a greater number of these calculators will be developed and made available in the upcoming period. Additionally, one such calculator is the outcome of this study (Machalík, 2023).

On the basis of the conducted research, a new emission calculator was designed and implemented to meet the needs of the research patron (Figure 1). Compared to the observed calculators, it allows a more flexible choice of input parameters and offers

a detailed overview of GHGe produced by selected transport. This calculator is available online (Machalík, 2023) and can be viewed/used with permission of the author and patron.

6 Conclusion

The issue of GHGE from freight transport is relevant for the whole global society. Far from being just a theoretical scientific study, the issue is also being addressed by companies themselves in their logistics planning. Some companies are profiling themselves as socially responsible and taking environmental and social aspects of their activities, products and services into account in their business activities. The use of emission calculators thus contributes to reducing the negative environmental impacts of production and reduction of goods. The best-known logistics companies possess their proprietary emission calculators, whereas the majority of others use free ones.

The goal of the article, which lies in the analysis of freely available freight transport emission calculators, has been realized as a review and comparison of specified input and output parameters, modes of transport and methodologies used. The results of the analysis could contribute to the improvement or development of new types of emission calculators. There is currently no freight emissions calculator that includes all the specifics.

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EXPLORING THE VALUE OF THE SEA: A STUDY OF THE BLUE ECONOMY IN THE EU AND PORTUGAL

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Abstract This paper examines the concept of the "blue economy" in the context of the European Union (EU) and Portugal, exploring the economic importance of the sea and its resources. First, it provides an overview of the EU blue economy and its contribution to the overall EU economy over the last decade. Data from the European Commission shows that coastal tourism is the most important sector both in terms of Gross Value Added (GVA) and employment, with the four largest EU countries (Spain, Germany, Italy, and France) being the largest contributors to the EU blue economy. In this context, this study aimed to investigate the performance of Portuguese coastal tourism in comparison to other European coastal countries, particularly in relation to the 2008 financial crisis and the COVID-19 pandemic. The findings show that Portugal's GVA generated by the coastal tourism sector was consistently lower than the respective mean of all other European coastal countries in several years. The statistical tests confirm these results and suggest that Portugal's coastal tourism sector may need more attention and efforts to improve its economic performance.

Keywords:
sea resources, coastal toursm, blue economy, European Union, Portugal

JEL:
Q01, Q20, R11

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1 Introduction

The concept of the "blue economy" has become increasingly prominent in recent years due to its potential for providing economic benefits while protecting and preserving the world's oceans and seas. It refers to any type of economic activity that takes place at sea or is dependent on it, including marine natural capital and non-tradable services from marine ecosystems. It is expected that this economy will maintain its relevance due to increasing demands from growing populations and their standards of living (demand side), as well as developments in technology, economics, and logistics that have opened new possibilities for exploration (supply side) (EY-AM&A, 2019).

Although it is gaining traction internationally and regionally (Mulazzani & Malorgio, 2017; Bennett et al., 2019), there remains no single definition accepted by all on what exactly constitutes a "blue economy". The European Commission defines it as "all activities related to water bodies such as oceans, seas and lakes" which includes traditional uses like fishing but also other sustainable economic endeavors for Member States` (MSs`) coastal communities (European Commission, 2022). According to the OECD's take on this matter, any description would be inadequate if it did not include non-quantifiable natural stocks or non-market goods and services. Thus, they suggest that "the ocean economy should be understood as encompassing economic activities based around marine industries plus assets, goods, and services offered through marine ecosystems" (OECD 2016, 22).

There is a great complexity of maritime activities exercising one or more functions, and it is particularly difficult to establish a consensual delimitation of all sectors that integrate the so-called "hyper cluster" of the blue economy (SaeR and ACL, 2009). Despite the difficulty, it is possible to identify a set of maritime activities that fit into three types of industries: established, emerging, and potential. The established sectors are the major contributors to the blue economy. According to the European Commission (2022), seven sectors stand out due to their economic importance, each further divided into subsectors. These include marine living resources (primary production, processing and distribution of fish products); marine non-living resources (oil and gas, other minerals, support activities); marine renewable energy (offshore wind energy); port activities (cargo and warehousing, port and water projects); shipbuilding and repair services (shipbuilding, equipment and machinery),

maritime transport services (passenger transport, freight transport, transportation services); coastal tourism related activities such as accommodation and transportation; as well as other expenditures.

Portugal, an oceanic country with a coastline extending over 2,500 km, is one of the countries that recognizes the economic value of the sea; 48% of all maritime waters in areas adjacent to Europe under MS jurisdiction are part of Portuguese territory (DGPM, 2020a). It is therefore of utmost importance to analyze the importance of the blue economy in this country and compare it with the other EU MSs.

This research paper presents a description of the blue economy in the European and Portuguese contexts. Besides, since coastal tourism is the most important sector, both in terms of Gross Value Added (GVA) and employment, this study proposes to investigate whether Portuguese coastal tourism was more affected by the 2008 financial crisis and the COVID-19 pandemic than other European coastal countries.

After introducing some key features about the blue economy, section 2 focuses on the particularities of the EU context, while section 3 presents a national view of the evolution of the blue GVA and employment. Section 4 presents the adopted methodology, followed by the discussion and analysis of the achieved results. The paper ends with the main conclusions.

2 Theoretical Background

2.1 The EU Context

The EU's Directorate-General for Maritime Affairs and Fisheries is responsible for centralized maritime and fisheries policy. They are guided by two main policies, the Integrated Maritime Policy (IMP) and the Common Fisheries Policy (CFP). The IMP aims to coordinate policies that affect the oceans, seas, islands, coastal and outermost regions, and maritime sectors, to foster sustainable development in these areas. This policy has several objectives, including maximizing sustainable use of the oceans, building a knowledge base for maritime policy, improving the quality of life in coastal regions, promoting EU leadership in international maritime affairs, and raising the visibility of maritime Europe through various initiatives.

The Common Fisheries Policy (CFP) is a set of rules for sustainably managing European fishing fleets and conserving fish stocks. This policy was reformed in 2013 and now features attention to the environmental, economic, and social dimensions of fisheries, fish stock management at maximum sustainable yield, a landing obligation, continued application of multiannual plans, regionalization, fleet capacity ceilings, and the EU Marine Strategy Framework Directive (MSFD) to protect the marine ecosystem and biodiversity. The MSFD sets out 11 illustrative qualitative descriptors to achieve good environmental status (GES), but more concrete measures at the international level are proposed to address environmental, fisheries, and climate issues.

Furthermore, the EU's 2013-2020 Atlantic Action Plan (COM (2013) 279 Final) aims to boost the sustainable blue economy in the four MSs (Ireland, France, Portugal, and Spain) with Atlantic coasts and their outermost regions. The plan prioritizes promoting entrepreneurship and innovation, protecting, and enhancing the marine and coastal environment, improving accessibility and connectivity, and creating a socially inclusive and sustainable model of regional development (European Commission, 2023).

All in all, the contribution of established blue economy sectors in the EU varied greatly among MSs in 2020. In terms of employment, Spain had the highest share at 19%, while Luxembourg had the lowest at 0.1%. Germany had the highest share of GVA at 18%, while Luxembourg had less than 0.1%. Generally, the blue economy had a significant contribution to national GVA or employment in insular MSs or those with archipelagos, such as Greece, Malta, Cyprus, Croatia, and Portugal. However, Estonia was an exception, with a 6% employment share. Other MSs with relatively large blue economy sectors were Spain, Denmark, Latvia, Ireland, and Bulgaria, while landlocked MSs had limited contributions. Among the four largest EU economies, only Spain exceeded the EU average. Some MSs, such as Greece, Malta, Portugal, Latvia, and Denmark, saw a significant increase in blue jobs, while Bulgaria and Estonia experienced a decrease. The largest contributors to the EU blue economy in terms of both employment and GVA were the four largest MSs (Spain, Germany, Italy, and France), with Greece ranking second in employment contribution. Portugal, the Netherlands, and Denmark also made significant contributions. Most MSs saw an increase in GVA generated by established blue economy sectors between 2009 and 2020, with the most significant expansion

recorded in Ireland, Portugal, and Malta. However, GVA in Bulgaria and Greece had not yet recovered to 2009 levels in 2020. Some MSs, including Bulgaria, Croatia, Estonia, France, Italy, Romania, and Sweden, had not yet recovered 2009 employment levels.

2.2 The Portuguese context

From 2009 to 2020, the number of people employed in Portugal's blue economy sectors increased by 43.7%, from 167,615 to 240,875, despite some fluctuations due to the 2008 crisis and the COVID-19 pandemic (European Commission, 2023) – see Figure 1. Coastal tourism was the most significant sector, while ocean energy employed zero people throughout the analyzed period.

Figure 1: Persons employed in the sectors of the blue economy
Source: Adapted from European Commission (2023).

From 2009 to 2020, the contribution of blue economy sectors to Portugal's GVA at factor cost (GVAfc) increased significantly, with coastal tourism being the most significant sector. The blue sectors generated a GVAfc of €153,812.5 million in 2009, which increased to €181,820.1 million in 2020, representing an 18.2% increase – see Figure 2. However, there were periods of retraction during the economic crisis and the COVID-19 pandemic.

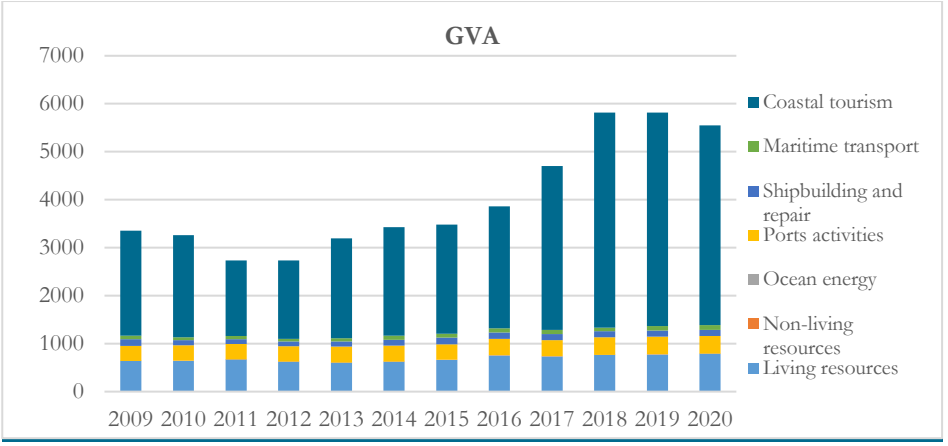

Figure 2: GVA in the sectors of the blue economy
Source: Adapted from European Commission (2023)

4 Methodology

This research study proposes to test the following hypothesis:

H1: Since 2010, Portugal's coastal tourism suffered more when compared with the group of all other European coastal countries from the impacts of the 2008 financial crises and its aftermath and the COVID-19 pandemic.

To test this hypothesis, the data used was the annual GVA at factor cost (GVA_{fc}) generated by the coastal tourism sector of all European coastal countries between 2009 and 2020, provided by the EU Blue Economy Observatory (European Commission, 2023). The hypothesis was operationalized in terms of the annual variation rate of the GVA_{fc}, comparing, for each year, the one for Portugal against the average of all other European coastal countries (amounting to 22 countries, the UK included). The statistical tests used were the one-sample Student's t-test or the Wilcoxon test, depending on the normality result provided by the Shapiro-Wilk (SW) test. Student's t-test and the Wilcoxon test were formulated with one-sided alternative hypotheses, and Cohen's d (d) and Common Language Effect Size (CLES) were computed to respectively assess the effect size.

5 Results and Discussion

Considering the observed values, reported in Table 1 and represented in Figure 3, the years effectively tested were 2010, 2011, 2012, 2015, 2016, 2019, 2020, as in those years the Portugal's GVA_{fc} is lower than the respective mean of all other European coastal countries.

Table 1: Annual variation rate of GVA_{fc} for Portugal and other European coastal countries

Statistics	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Portugal (Mean)	**-0.027**	**-0.259**	**0.040**	0.272	0.086	**0.007**	**0.116**	0.345	0.310	**-0.007**	**-0.065**
Other (Mean)	0.037	-0.004	0.047	**0.090**	**-0.018**	0.022	0.158	**0.080**	**0.224**	0.008	0.035
Other (Standard Deviation)	0.193	0.128	0.516	0.270	0.116	0.086	0.203	0.127	0.241	0.032	0.175

Note: Values in bold indicate the lowest value for each year.

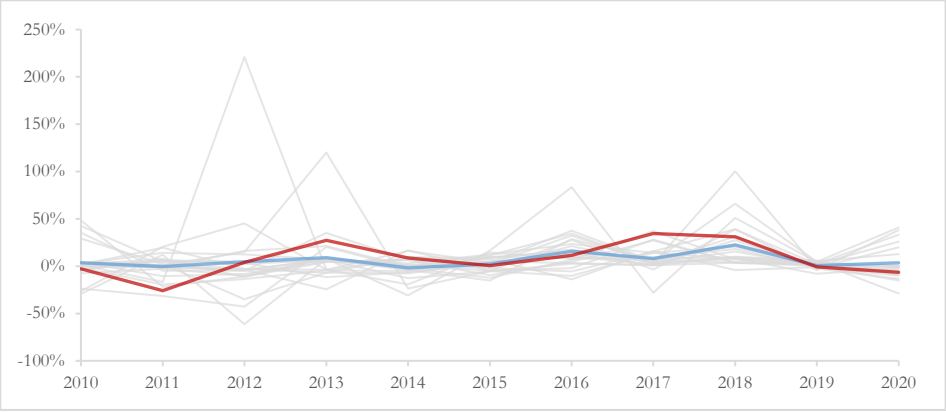

Figure 3: Annual variation rate of GVA_{fc} generated by the coastal tourism sector for Portugal (red line), other European coastal countries (light blue lines) and the respective mean (dark blue line).

Table 2 presents the statistical tests. The results obtained show that out of the seven years tested, only for 2010, 2011, 2019, and 2020, the null hypothesis, according to which the average GVA_{fc} in Portugal is equal to that of other European coastal countries, is rejected at a 5% level. Only on those four years does the alternative

hypothesis that Portugal's GVA was significantly lower than the respective average for all other European coastal countries prevail.

Table 2: Results of the statistical tests

year	Shapiro-Wilk		Student's t-test			Wilcoxon test		
	stat	p-value	t-stat	p-value	d	w-stat	p-value	CLES
2010	0.854	*0.004*	1.502	0.074	0.320	187	**0.025**	**0.727**
2011	0.953	0.355	9.085	**0.000**	**1.937**	251	0.000	0.955
2012	0.590	*0.000*	0.064	0.475	0.014	75	0.954	0.273
2015	0.969	0.686	0.788	0.220	0.168	152	0.212	0.591
2016	0.887	*0.016*	0.944	0.178	0.201	144	0.294	0.500
2019	0.960	0.496	2.101	**0.024**	**0.448**	194	0.014	0.682
2020	0.898	*0.028*	2.623	0.008	0.559	200	**0.008**	**0.773**

Notes: Italics in the SW p-value indicates normality rejection at a 5% level (thus pointing to Wilcoxon test). Values in grey indicate that the test was not considered due to the result of the SW test. Values in bold correspond to rejection of the null hypothesis at a 5% level, either in Student's t-test or in Wilcoxon test.

Looking at the effect size in Table 2, it is medium in 2010, 2019, and 2020, and large in 2011 (Fritz et al., 2012). Thus, the impact was more noticeable in 2011. As to the impact in 2019, even though the effect size is medium, it is relevant to notice that, on that year, the annual variation rate was very small in magnitude in all countries (0.008, thus 0.8%, in mean and with a standard deviation of 0.032).

6 Conclusions

The blue economy is becoming increasingly important in the global economy due to population growth, demand for resources, and advances in technology and logistics. The blue economy comprises three types of industries, namely established, emerging, and potential sectors. Coastal tourism is the most significant sector in terms of GVA and employment. This study investigates whether Portuguese coastal tourism was more affected by the 2008 financial crisis and the COVID-19 pandemic than other European coastal countries. Portugal's GVA_{fc} generated by the coastal tourism sector was consistently lower than the respective mean of all other European coastal countries in the years 2010, 2011, 2019, and 2020. The statistical tests conducted confirm these findings, as the null hypothesis that the average GVA_{fc} in Portugal is equal to that of other European coastal countries is rejected at a 5% level only for those four years. The effect size analysis indicates that the impact was more noticeable in 2011, although in 2019, the effect size was medium but with a very

small annual variation rate in all countries. These results suggest that Portugal's coastal tourism sector may need further attention and efforts to improve its economic performance compared to other European coastal countries.

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SLOW FASHION AND SUSTAINABLE DEVELOPMENT

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Abstract The garment industry is the second largest polluter of the environment. This sector is characterized by high consumption of water, chemicals, and greenhouse gas emissions. In addition, textiles make up a significant part of municipal production. In this context, the sector of so-called fast fashion, or fast fashion, producing much trend-based clothing, can be particularly problematic. This leads to frequent changes in clothing and the formation of large amounts of textile waste. Therefore, it seems crucial to increase consumer interest in sustainability issues and identify their attitudes to sustainable fashion, thus strengthening the trend of slow fashion. When buying clothes, factors such as quality, brand, price, whether the garment corresponds to current trends, and whether the clothing is made with respect for the environment can be considered. This article aims to identify the importance of the sustainable fashion factor in the consumer's purchasing decisions. The set goal will be achieved using questionnaire survey methods and secondary data analysis. The benefit of this article will be a well-arranged analysis of consumer attitudes towards sustainable fashion with a particular focus on fashion made from recycled materials.

Keywords:
consumer behaviour, recycled materials, slow fashion, sustainable development, SDGs

JEL:
M31, P46, Q01

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1 Introduction

The fashion and garment industries are important sectors of many national economies, and evidence of the production of textiles and clothing goes back to the distant past. Mainly in the second half of the 20th century, there was a massification of this sector, which was caused by the growing demand for textiles in general and the emergence of several fashion brands that established themselves on the market mainly because they offered relatively high-quality, affordable and trendy fashion (Mandarić, Hunjet et al., 2022). The problem is that the garment industry is the second largest polluter of the environment. This sector is characterized by high consumption of water, chemicals, and also greenhouse gas emissions (Bailey et al., 2022). In addition, textiles account for a significant part of the municipal waste generated (De Oliveira et al., 2022; Filho et al., 2019). The sector of so-called fast fashion, which produces a large number of trend-based clothing, can be particularly problematic in this context. This leads to frequent changes in clothing and the creation of large amounts of textile waste (de Oliveira et al., 2022).

The situation described above is becoming increasingly unsustainable, and prominent fashion chains with so-called fast fashion are looking for ways to fulfil their economic goals and, at the same time, behave socially responsibly, especially regarding environmental protection (Bick et al., 2018). This is probably the reason why these chains are trying to focus their attention on so-called slow fashion. Slow fashion is an aspect of sustainable fashion and a concept describing the opposite of fast fashion, part of the "slow movement" advocating for clothing and apparel manufacturing concerning people, the natural environment and animals (Solino et al., 2020). One of the possibilities of so-called sustainable fashion is using recycled materials, e.g. ET bottles or other suitable materials, to produce textiles (Harmsen et al., 2021). The will on the part of these companies to bring about a positive change in their business is obvious, the question remains how consumers themselves react to these products, and it is precisely the determination of partial attitudes of consumers towards sustainable fashion that is the subject of this article.

2 Literature Review

Surveys show consumer interest in sustainability issues is growing, and engagement in this area has increased during the pandemic. This means that the trend of so-called slow fashion is gradually strengthening. As the leading representatives of fast fashion, fashion chains have also had to react to this fact and adopt sustainability aspects to the demand for less environmentally friendly clothing (Dangelico et al., 2022; De Oliveira et al., 2022). One way to make the fast fashion sector more sustainable is using recycled textiles for clothing. Therefore, fashion chains have started to use these materials to produce (Filho et al., 2019).

When buying clothes, factors such as quality, brand, price, whether the garment corresponds to current trends, and whether the clothing is made with respect for the environment can be considered (Colasante & D'Adamo, 2021). However, the question remains about how important this factor is in purchasing decisions because even a consumer's concern about the state of the environment is not necessarily reflected in his purchasing behaviour (Mason et al., 2022).

The stumbling block in this market may be whether consumers believe in the fashion chain's positive environmental impacts made from recycled materials. This is also related to whether they are sufficiently informed about this issue to make informed decisions without requiring lengthy searches for information.

Based on the literature review and set goals of the article, a research hypothesis has been established, i.e., an unverified claim that can be statistically tested. An alternative hypothesis to the null hypothesis was verified. If the null hypothesis is rejected, an alternative hypothesis is accepted. For hypothesis testing, the research chose a significance level of $\alpha = 0.05$, representing the risk of erroneous rejection of the null hypothesis. The following hypotheses were set:

H_0: Searching for (purchasing) clothing from recycled materials does not depend on environmental attitudes.

H_1: Searching for (purchasing) clothing from recycled materials depends on the attitude to the environment.

3 Methodology

The research was carried out as part of the research project Determinants of Consumer Behavior and their Influence on Typology, registered under the number SP2023/052 at VSB-Technical University Ostrava. The main objective of the submitted article the research was to identify consumers' attitudes to the fashion offered by large clothing chains (fast fashion) made using recycled materials. "fast fashion" is defined as " inexpensive clothing products produced by mass-market retailers in response to the latest trends." This makes it easy to see why fast fashion appeals to a large market, and its low prices and trendy styles tempt people to buy large amounts of clothing simultaneously (Wu, 2020). Another sub-goal was to find out the relationship of fast fashion consumers to the environment.

The following research questions follow the defined objectives and further develop them:

- What is the attitude of fast fashion consumers to the chain of clothes offered from recycled materials, and do they believe in their environmental friendliness?
- Is there a link between the search for these products and a positive attitude toward the environment?

3.1 Research method

Primary data was collected using the CAWI (Computer Assisted Web Interviewing) method. It is a quantitative research method where the interviewing is carried out using an online questionnaire. The questionnaire was conducted from 11/22 to 02/2023. This method brings several advantages but also disadvantages. Benefits include speed, cost savings, and the ability to use supporting visual or audio materials. Conversely, areas for improvement can be seen in the need to access the Internet or the problem with the credibility of respondents' answers (Malhotra et al., 2017; Tahal et al., 2017).

3.2 Sample

The method was chosen to ensure a sample of respondents of sufficient size. It also considers that fashion chains often have e-shops linked to brick-and-mortar stores. It can therefore be assumed that their customers move in an online environment. The core set consisted of women and men aged 15 to 64 (residents of the Czech Republic) who visit fashion chains and, at the same time, notice clothing made from recycled materials. Included in this set were both consumers who search for and buy these products but also consumers who have noticed these garments but do not cool them. Both respondents are suitable because they have at least an essential awareness of fashion made from recycled materials and can express their views on it. The age restriction for respondents aged 15 to 64 was due to the chosen method – online interviewing. This age group can be assumed to be in the Internet environment.

The sample size was planned at 385 respondents, and the quota sampling method was chosen for selecting respondents. This method makes achieving the sample's representativeness possible by setting quotas for desired traits (e.g., age or sex). This ensures that the sample will be similar to the primary sample and thus bear the characteristics of the basic model (Tahal et al., 2017).

The gender and age of the respondents were determined as quota variables. Data from the Czech Statistical Office for 2021 determined the quotas. Gender was defined as the first quota variable. In the age range of 15–64 years, there is a slight predominance of men over women, namely by 2% (CZSO, 2022). The second quota variable was age. According to him, five age categories were formed.

4 Results

As mentioned above, the marketing research was supposed to answer two fundamental questions, namely, what is the attitude of fast fashion consumers to the chain of clothing offered from recycled materials and do the consumers believe in the environmental friendliness of fashion chain furthermore, whether there is a connection between the search for these products and a positive relationship to the natural environment. Based on the data from the survey hence, the null hypothesis is rejected and alternative hypothesis is accepted.

To obtain a general overview, one of the questions was set to get information on which factors consumers consider when buying clothes, where one of the factors was the factor of environmentally friendly production. Another research issue presented in this article is the question about attitudes toward recycled clothing. The last question that will be given space within the report will be on the attitude to the environment so that one of the research questions can be answered and the established hypothesis confirmed or refuted.

4.1 Factors considered when buying clothes

Respondents were asked what factors they consider when buying clothes. Based on the data obtained, it can be stated that the most important for respondents when buying clothes are quality (83.1%), price (76.1%), and relatively more closely followed by current trends with 34.7%. "Production with respect for the environment" is a factor 21.2% of respondents consider. The answers "look," "fits/fits," and "comfort" were added after processing the respondents' answers. The test carried out, in this case, did not reveal any dependence of selected factors on identification questions. Quality and price are the most critical factors for both women and men. However, current trends are in third place for women (32.9%) and brand (38.6%) for men, considered by 10.3% of respondents. Depending on age, the factors of quality, price, and trends are also considered the most. Regarding differences in answers by education, while respondents with primary and secondary education mainly considered price (almost 95%), quality proved to be the dominant factor among respondents with university and tertiary professional education (82.6%). For respondents with an income of CZK 50,000 or more, the most important brand is the most important after quality (55.3%). According to the answers received, this factor is the least important for the income group of CZK 40-49 thousand and CZK 10,000 and less (Mikolášová, 2023).

4.2 Attitudes towards recycled clothing

Attitudes towards recycled clothing were analyzed based on ten claims. Respondents reported agreement with the claim on a scale where one meant utterly agree and a value of 5 completely disagreed. Respondents most agreed with the statement, "Wearing clothes made from recycled materials is trendy," and the average approval rating was 2.3. On the other hand, the least respondents agreed with the statement that "Clothing made from recycled materials is timeless (not subject to trends)." In

this case, the average consent value was 3.4. Furthermore, respondents agreed more that the production of recycled garments is environmentally friendly (average value 2.4) than that its disposal is environmentally friendly (average value 2.6). It is also clear that, on average, respondents tended to agree with all statements, or their position approached the neutral point (Mikolášová, 2023).

The T-test verified whether men and women agreed with these statements on average equally. For some claims, there are more significant differences in the average rating. The test also confirmed this fact carried out for a total of 6 shares. That clothing from recycled material is of good quality, easier to maintain, unaffordable, timeless, environmentally friendly, and has a small selection. It can be seen that the average rating of men, except for the statement "Clothing made from recycled materials is unaffordable (expensive).", is always higher. This means that they expressed a lower level of approval than women. Both male and female respondents most strongly agreed that wearing clothes made from recycled materials is trendy (average value 2.1 for women and 2.36 for men). Men disagreed the most with the statement that clothing made from recycled materials is not subject to trends (average value 3.6), and women that recycled dress is easy to maintain, with an average value of 3.21 (Mikolášová, 2023).

4.3 Attitudes towards the natural environment

In this question, respondents reported on a scale how often they do a given activity related to the relationship to ecology, with the value 1=very often and 5=never. Table 1 shows how often respondents perform a given activity on average. It can be seen that respondents recycle waste most often (average value 1.5) and contribute least often to organizations dealing with nature conservation (average value 3.74). Respondents are more likely to buy natural cosmetics (average value of 2.59) than organic food (average weight of 2.8) or other products made from recycled materials average value of 2.93 (Mikolášová, 2023).

To find out whether the answers of men and women differ, a T-test was performed, which showed the difference in two activities "I buy natural cosmetics" and "I consider environmental problems to be serious, and I take them into account when making purchasing decisions." On average, women buy natural cosmetics more often than men and consider environmental issues more often.

Table 1: Attitudes towards the natural environment

Activity	Average
I recycle waste	**1,5**
I consider environmental problems to be serious and I take them into account when making purchasing decisions	2,62
I buy other products from recycled materials (e.g. furniture) besides clothes	2,93
I buy natural cosmetics	2,59
I buy organic food	2,8
I avoid buying products of companies that do not respect the environment	3,21
I contribute to organizations that deal with nature conservation	**3,73**
I find out about the environmental impacts of purchased products	3,45
I read labels on clothes to check if they have been sustainably produced	3,17
I am willing to pay more for a product that is proven to be environmentally friendly	2,92

Source: Mikolášová (2023).

5 Discussion and Conclusion

Slow fashion as an aspect of sustainable fashion is becoming a trend and necessary for the future sustainable development of society and states' economies. Sustainable fashion describes the opposite of fast fashion, part of the "slow movement" advocating for clothing and apparel manufacturing concerning people, environment, and animals (Staniforth, 2010). Sustainable fashion is becoming a trend and necessary for the future sustainable development of society and states' economies. Sustainable fashion is gaining ground in the Czech market with increasing intensity. The authors consider it necessary to remind that their positive attitude towards concern for the environment is not only manifested when buying fashion, but as the green thinking survey showed, it is also evident in daily activities.

Based on the survey, it follows that the impact of fashion production on the environment is not one of the most important from the consumer's point of view. Still, it is essential in decision-making regardless of the consumer's gender, age, and income. Respondents perceive clothing made of recycled material as trendy as the most significant advantage, and the least favorable response was the claim that dress is timeless. As for the first research question, we can declare that consumers have a positive attitude to fashion made from recycled materials. As for the second research question, the link between attitudes towards fashion made from recycled materials

and perspectives towards the environment, women have shown a more significant link between 'green behaviour' and preference for style made from recycled materials. Marketing research was carried out within the Czech Republic, so in the future, there is an opportunity to conduct the same analysis with the consumers of another country and compare the results achieved. The alternative hypothesis "Searching (buying) clothing from recycled materials depends on the attitude to the environment" was verified.

Marketing research was conducted within the Czech Republic. The results of the conducted research can bring interesting information for fashion chains about who is a specific segment of sustainable fashion products. Due to the relevance of the topic and its growing importance in the future, it is possible to use the prepared research questions and the results of marketing research to implement marketing research in other countries and thus compare consumers' attitudes in different countries. This step would lead to a more comprehensive view of the issue of sustainable fashion and its future in the eyes of consumers.

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Sectoral Differentiation of the Interval Effect in the Time of the COVID-19 Pandemic: The Case of WSE

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Abstract The occurrence of differences in the values of the β depends on the adopted returns. In the literature this has been called the interval effect. The main objective of this paper is to verify the existence of the differentiation of the beta coefficient (β) interval effect of shares of companies listed on the Warsaw Stock Exchange (WSE) during the COVID-19 pandemic due to their macro sectoral affiliation. The β is calculated using the ordinary least squares method (OLS) on the sample of issuers grouped in the following indices: WIG20, mWIG40 and sWIG80. By analyzing the β values estimated on the different time horizons of returns has been observed the occurrence of the β interval effect in the years of the COVID-19 pandemic. Finance and Industrial Production did not indicate statistically significant differences between the β values calculated for different time horizons of returns in the pre-pandemic years. However, in these years, the interval effect has been recorded in the case of Healthcare and Trade and Services. Based on the research results obtained, the impact of the COVID-19 pandemic on the sectoral differentiation of the interval effect can be observed.

Keywords:
interval effect, beta coefficient, COVID-19, Warsaw Stock Exchange, shares.

JEL:
C20, G11, G17

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1 Introduction

One of the parameters of the Sharpe model is the beta coefficient (β). It reflects the non-diversifiable part of the volatility of returns. The process of its estimation is associated with numerous difficulties (Feder-Sempach, 2017, 20-21). One of them is indication of the returns' interval used to calculate it. When using different time intervals (from daily to several years) to calculate β, significant differences in estimates were noticed. The occurrence of these differences in the values of the β depends on the adopted period of the used share quotations of companies, which has been called the interval effect.

The main purpose of this article is to verify the occurrence of differentiation of the interval effect in the time of the COVID-19 pandemic (2020-2021). It will be conducted from the point of view of the affiliation of issuers to selected macro sectors listed on the Warsaw Stock Exchange (WSE). Moreover, the β values calculated for 2020-2021 (using daily, weekly, biweekly and monthly returns) for issuers from individual macro sectors will be compared with those recorded in 2018-2019.

The research will allow to deepen the knowledge of Polish capital market participants in the scope of the possibility of using β to measure the systematic risk of shares listed on the WSE in times of instability on capital markets.

2 Literature Review

Choosing the right timeframe to measure returns was of interest to researchers as early as the 1970s. The first empirical study showing the differences in β was carried out by Pogue and Solnik (1974). They analyzed the aforementioned coefficients on the American and seven European capital markets and diagnosed the occurrence of a range effect (measured by the quotient of the monthly and daily β value) for the above-mentioned markets.

The authors of next studies noticed interesting conclusions. Hawawini (1983) and Handa et al. (1989) noticed the differentiation of the β interval effect depending on the capitalization of companies. The interval effect was also tested in European capital markets. When examining companies listed on the Brussels Stock Exchange,

it was noticed that the values of β depend on the day adopted for the first day of verification of the interval effect (Corhay, 1992). The observations relating to the occurrence of the interval effect have been confirmed also in the Australian market (Brailsford & Josev, 1997).

In terms of the WSE, there have been some really interesting publications on the interval effect also. Among the first papers were the studies by Brzeszczyński et al. (2010). The authors estimated the effect of the interval for 1-, 5-, 10-, and 21-day returns on stocks. The comparative analysis of the interval effect on the example of shares of companies from the WIG20 index and the German DAX (Feder-Sempach, 2017) or a study of the impact of the COVID-19 pandemic on stock market risk measured by the β (Lisicki, 2023).

In recent years, one can also find research on sectoral differences in the value of β depending on the time horizon of the returns (Dadakas et al., 2016), which is thematically closest to this paper. The authors also pointed out that the prediction of returns depends on the sector (Westerlund & Narayan, 2015). Also, in the times of the COVID-19 pandemic it is possible to observe the attempts to quantify β of securities listed on many global capital markets in the era of increased uncertainty that accompanies years 2020-2021 (Neslihanoglu, 2021). Similarly to the β analysis in previous crisis periods, the values of this coefficients increased during the COVID-19 pandemic, especially in its first phase (Jain, 2021). Moreover, it was possible to indicate industries in which their values increased higher than in others (e.g. IT, insurance, consumer goods). In another study, the authors have been observed decreases in β values during the pandemic years for small and medium-sized companies (Hua Cao et al., 2021).

3 Methodology

The interval effect has been verified by calculating the β for shares of selected issuers from the WIG index. Research sample has been narrowed to the 140 largest companies grouped in the three main WSE indices: WIG20 (which groups 20 the biggest issuers in the WSE), mWIG40 (40 medium-size issuers) and sWIG80 (80 small issuers). Author decided to use the historical portfolios of these indices as of the first quarter of 2020 (WSE, 2020). β has been calculated using the OLS (*Ordinary Least Squares*) method for the daily, weekly, biweekly and monthly returns. The WIG

index (broad market index of WSE) has been used to indicate the market return. The period of analysis covers years of the outbreak and duration of the COVID-19 pandemic (2020-2021) and years immediately preceding it (2018-2019). The quotations (used to calculate the β) of shares of the indicated issuers have been downloaded from the stooq.com (2022) quotation database.
In the paper the industry of issuers from the point of view of 8 macro sectors distinguished with the WSE Sector Classification Regulations of July 24, 2019 has been considered.

4 Results and Discussion

The average values of the β calculated for four-time horizons of returns (daily, weekly, biweekly and monthly) in connection to macro sectors are presented in Table 1. The numbers of issuers qualified for the study are also presented in brackets. Due to the fact that shares of selected issuers were not listed on the Warsaw Stock Exchange throughout the whole period of the study (2018-2021) finally qualified 115 issuers to the research sample.

Analyzing the data contained in Table 1, it is possible to indicate that the average values of β for the two analyzed periods increase along with the lengthening of the time horizon of the return for major part of the indicated macro sectors. This result is similar with the discoveries made by researchers in this area (Diacogiannis et al., 2008; Brzeszczyński et al., 2011).

The highest average β values in 2020-2021 can be observed for issuers from the FINANCE macrosector (weekly, biweekly and monthly returns) and CHEMICALS AND RAW MATERIALS (daily returns). Especially for FINANCE macro sector, the research results are similar with the results conducted in other capital markets. Shares of financial companies that were characterized by higher than average volatility β in times of crisis (Haroon et al. 2021). The lowest β values can be observed in 2020-2021 (for all time horizons) in the case of issuers from the TECHNOLOGIES macro sector. These issuers have been indicated usually on the Polish market as having lower β values (Feder-Sempach & Szczepocki, 2022). In 2018-2019, the highest averaged value of β occurred for issuers in the macro sectors: CHEMICALS AND RAW MATERIALS (weekly and monthly returns), TRADE AND SERVICES (biweekly returns) and FUELS AND ENERGY (daily returns).

The lowest value can be observed for issuers grouped in the macro sectors: CONSUMER GOODS (biweekly and monthly returns), INDUSTRIAL PRODUCTION (weekly returns) and HEALTHCARE (daily returns).

Table 1. Average values of β coefficients for selected issuers listed on the WSE in 2020-2021 and 2018-2019

2020-2021				
β/Macrosector	**Beta daily**	**Beta weekly**	**Beta biweekly**	**Beta monthly**
FINANCE (22)	0.969	1.023	1.192	1.239
FUEL AND ENERGY (13)	0.890	0.957	0.988	0.917
CHEMISTRY AND RAW MATERIALS (11)	0.991	0.996	1.048	1.038
INDUSTRIAL PRODUCTION (20)	0.853	0.954	1.120	1.216
CONSUMER GOODS (14)	0.894	1.001	1.190	1.138
TRADE AND SERVICE (17)	0.835	0.979	0.987	0.949
HEALTHCARE (8)	0.937	0.954	0.683	0.740
TECHNOLOGIES (10)	0.687	0.641	0.576	0.564
AVERAGE FOR ALL	**0.882**	**0.938**	**0.973**	**0.975**
2018-2019				
FINANCE (22)	0.671	0.710	0.808	0.778
FUEL AND ENERGY (13)	0.781	0.828	0.672	0.752
CHEMISTRY AND RAW MATERIALS (11)	0.712	0.945	0.876	0.923
INDUSTRIAL PRODUCTION (20)	0.392	0.519	0.696	0.696
CONSUMER GOODS (14)	0.511	0.603	0.668	0.529
TRADE AND SERVICE (17)	0.557	0.811	0.898	0.724
HEALTHCARE (8)	0.195	0.565	0.718	0.708
TECHNOLOGIES (10)	0.463	0.594	0.699	0.705
AVERAGE FOR ALL	**0.535**	**0.697**	**0.754**	**0.727**

Source: Author's calculations based on stooq.com (accessed: 20.07-22.08.2022).

Consequently, it is possible to indicate that the COVID-19 pandemic affected the levels of β in macrosectors. It caused a different (usually stronger, positively correlated) average reaction of stock quotations of issuers from individual sectors (as a result of a change in the market index by one percentage point). These research results somehow confirm the previous results indicating the differentiation of the β value due to sectors (Liu, 2004).

Table 2. Values of the t-Stat statistics for differences between the β for shares of issuers from WSE macrosectors in 2018-2021

Pair of β/ Macrosector	β daily β weekly	β daily β biweekly	β daily β monthly	β weekly β biweekly	β weekly β monthly	β biweekly β monthly
2020-2021						
FINANCE	-0.49	-1.91**	-2.27*	-1.46	-1.82**	-0.38
FUEL AND ENERGY	-0.38	-0.56	-0.12	-0.16	0.18	0.31
CHEMISTRY AND RAW MATERIALS	0.02	0.36	0.39	0.38	-0.24	0.07
INDUSTRIAL PRODUCTION	-0.71	-1.69**	-2.3*	-0.97	-1.73**	-0.52
CONSUMER GOODS	-0.72	-1.64	-1.1	-0.97	-0.59	0.21
TRADE AND SERVICE	-0.81	-0.75	-0.43	-0.04	0.1	0.13
HEALTHCARE	-0.09	1.58	0.84	1.45	0.85	-0.26
TECHNOLOGIES	0.39	0.94	0.92	0.51	0.55	0.09
2018-2019						
FINANCE	-0.33	-1.2	-0.75	-0.91	-0.5	0.22
CHEMISTRY AND RAW MATERIALS	-1.14	-0.79	-0.83	0.31	0.07	-0.18
INDUSTRIAL PRODUCTION	-1.05	-2.04**	-1.37	-1.06	-0.76	0.01
CONSUMER GOODS	-0.71	-1.17	-0.13	-0.45	0.5	0.91
TRADE AND SERVICE	-1.7**	-1.89**	-0.85	-0.41	0.39	0.74
HEALTHCARE	-2.2*	-3.02*	-1.86**	-0.83	-0.5	0.03
TECHNOLOGIES	-1.03	-1.78**	-1.2	-0.76	-0.54	-0.03

** $p<0.1$

* $p<0.05$

Source: Author's calculations based on stooq.com (accessed: 20.07.-22.08.2022).

After evaluating the averaged β next part of the paper cover a verification of statistical significance their differences. For this purpose, a test will be used to check the significance of differences between two dependent groups. Suitable statistical test to this case should be a parametric *t-test for dependent groups* (Kyun, 2015, p. 52) for each 6 pairs of β calculated for a different time horizon of returns (separately for each macro sector and period). For its implementation, it is required to meet the assumption of the normality of variable distribution. For the adopted research

sample it has been positively verified for each macro sector using the D'Agostino-Pearson normality test (D'Agostino et al., 1990, 320). The results of the statistical verification have been presented in Table 2, which includes the values of the t-test statistic (t-Stat) and their significance level (two-tailed p-value-if it was lower than $p<0.10$).

Analyzing the results of the statistical verification presented in Table 2, it can be observed a significant differentiation of the β values. It concerns especially in 2020-2021 issuers grouped in the macro sectors: FINANCE and INDUSTRIAL PRODUCTION. Therefore, it indicates the possibility of the occurrence of the β interval effect. It is also important that for the FINANCE macro sector in 2018-2019 no statistical significance of differences β was demonstrated for any of the analyzed pairs of coefficients and for the INDUSTRIAL PRODUCTION macro sector the significance was observed only for one of the pairs of coefficients. It is probably to conclude that the occurrence of the β-interval effect in the case of these two sectors could be related with the occurrence of the COVID-19 pandemic, because in the pre-pandemic years these relationships were not similar. This result is also justified by previous studies, in which researchers indicated increased β volatility of industrial Asian companies during the Asian crisis in 1997-1998 (Choudhry et al., 2010) and companies from the broadly understood financial sector during the pandemic COVID-19 in the Indian market (Jain, 2021).

4 Conclusions

The pandemic realities created incentives to verify the dependencies noticed on the capital markets in previous years (Ruiz Estrada, Koutronas, Minsoo, 2021). This is undoubtedly an attempt to verify the sectoral differentiation of the interval effect on the example of the macro sectors of companies listed on the WSE.

Verification of the sectoral differentiation of the interval effect has been taken place on a sample of 115 issuers listed on WSE. For each of them, based on the OLS method, the β were calculated each time for daily, weekly, biweekly and monthly returns. The presented β values show significant differences when comparing periods 2020-2021 and 2018-2019, which is especially noticeable for the macro sectors CONSUMER GOODS, INDUSTRIAL PRODUCTION and FINANCE. In addition, the statistical verification of differences in the β estimated using four-

time horizons of returns, showed that for two of these sectors (INDUSTRIAL PRODUCTION and FINANCE) during the COVID-19 pandemic years an interval effect has been observed. Moreover, in the pre-pandemic years, a similar relationship did not exist, but it could be observed for issuers from other macro sectors. Based on these research results, it can be concluded that the COVID-19 pandemic influenced the sectoral differentiation of the occurrence of the β interval effect, which in 2020-2021 applies to other industries than in 2018-2019.

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THE PERFORMANCE OF EU CEE UNIVERSITIES AGAINST THE UN SUSTAINABLE DEVELOPMENT GOALS

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Abstract The Sustainable Development Goals (SDGs) of the United Nations (UN) play an important role in raising societies' consciousness regarding the sustainability of our planet – a key issue for everyone. The purpose of this paper is to present and assess the performance of universities in EU CEE-11 countries (the 11 Central and Eastern European Member States of the European Union) against the UN SDGs. For this, we analyse the results of EU CEE-11 universities in the Times Higher Education Impact Rankings that are available in four editions (for the period 2019-2022). The results of the analysis reflect the still quite modest level of SDG awareness in higher education in the region, but also the progress in this respect (the increasing number of universities participating in the ranking), as well as the differences between the individual countries. Based on these findings, we identify and describe specific proposals for raising SDG awareness and strengthening SDG-related actions in EU CEE universities, contributing also to the strengthening of their reputation in the international higher education community.

Keywords:
UN SDGs, Central and Eastern Europe, higher education, Times Higher Education, rakings

JEL:
A13, I23, Q01

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1 Introduction

Sustainable development is a widely known expression today, reflecting the multiple challenges humanity realized during the last few decades it faces. Sustainability has several aspects other than environmental. After 2000 these have also been recognized as features of sustainability; now they are part of the Sustainable Development Goals (SDGs) of the United Nations (UN). Today, all individuals and organizations have their roles to play regarding all these aspects.

This paper discusses the performance of higher education institutions in the 11 Central and Eastern European member states of the European Union (EU CEE-11), universities in the Times Higher Education (THE) Impact Rankings. After a brief outline of the theoretical and historical background of sustainable development, the methodology will be presented. That part is followed by the presentation of the results and their interpretation, including future-oriented concluding remarks.

2 Theoretical Background

Sustainable development has become one of the most discussed multidisciplinary issues in the last half-century. The starting point of reflection was in most aspects the United Nations Conference on Human Environment in Stockholm in 1972, where the participants set up an action plan based on 26 principles and 109 recommendations outlined in the Report of the Conference (United Nations, 1973). The definition of the notion of "sustainable development" came 15 years later, with the Brundtland Report (Brundtland, 1987). After some important steps following the Brundtland Report (the Montreal Protocol on Substances that Deplete the Ozone Layer, the establishment of the Intergovernmental Panel on Climate Change, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal), it was the Rio Earth Summit in 1992 that has put sustainability again into the focus of attention of masses of people.

In 1995, the Marrakesh Agreement Establishing the World Trade Organization (World Trade Organization, 1995) has already explicitly referred to the objective of sustainable development. The adoption of the Kyoto Protocol (United Nations Framework Convention on Climate Change, 1997) was an important milestone.

However, the difficulties arising around its ratification (the fact that the document could enter into force only in 2005, and that the United States have not ratified it) have shown the difficulty of the issue, even with the pragmatic approach emphasizing the "common but differentiated responsibilities and capabilities" of the countries of the world.

The multidimensional nature of the issue of sustainable development was made clear to everyone with the definition of the 8 UN Millennium Development Goals in 2000, defined in the Millennium Declaration (United Nations, 2000). Even though most objectives had not been fulfilled by the target date (2015), the multidimensional reflection had developed further. In 2015 the UN Member States have adopted the 2030 Agenda including the 17 SDGs (United Nations, 2015) which, since then, constitute a cornerstone of the analyses on sustainability.

Among recent scientific analyses on higher education and sustainable development, Owens (2017), discusses SDG 4 and the buildup of university strategies for reaching it. Chankseliani – McCowan (2021) discuss the role of SDG 4 and mention the THE rankings. Boeve-de Pauw – Gericke – Olsson – Berglund (2015) and Crespo – Míguez-Álvarez – Arce – Cuevas – Míguez (2017) provide empirical examples for potential actions in higher education for reaching the SDGs. In Hungary (the country of the author), Lányi – Kajner (eds.) (2019) provide a panorama on sustainability in higher education.

3 Methodology

This paper presents the performance of EU CEE-11 universities in the Times Higher Education Impact Rankings, considering the results of the overall ranking. These rankings are available for four years, for the period of 2019-2022, concentrate on four broad areas (research, stewardship, outreach and teaching) and consider all 17 SDGs.

Any university providing data on SDG 17 (briefly defined as partnerships for the goals) plus at least three other SDGs can be included in the overall ranking. The final overall score of the university is the combined score in SDG 17 (with a 22% weight in the final score) and of the scores in the top (from the point of view of the given

university) three scores of the other 16 SDGs (with a 26% weight each in the final score).[1]

For this paper, we have selected and analyzed the overall results of the EU CEE-11 universities from all four editions of the THE Impact Rankings. The method used in the paper is descriptive statistical analysis providing a basis for further research along the paths described in section 5.

4 Results

The THE Impact Rankings are quite new; this is reflected in the increase in the number of participating countries and universities every year (see Table 1). The development of the participation of EU CEE-11 universities is in line with the general trend; as for the 2022 THE Impact Rankings, 106 universities from 10 of the EU CEE-11 have been included.

Table 1: World and EU CEE-11 countries and universities in the THE Impact Rankings

Year	Number of universities participating	Number of countries/regions represented	Number of EU CEE-11 universities participating	Number of EU CEE-11 countries represented
2019	467	76	17	7
2020	768	85	33	8
2021	1118	94	47	9
2022	1406	106	61	10

Source: Author's compilation based on THE Impact Rankings data (2021).

The country distribution of the participating EU CEE-11 universities is presented in Table 2. The figures reflect several factors: the differences in country size (and the roughly corresponding differences in the number of universities in the countries), as well as eventual differences in realizing the possibility of participation. Of course – as is also the case with overall data – the universities included still represent a relatively small (but increasing) part of higher education institutions in the region. The more the present trend of broadening participation continues in the years to

[1] Further details on the methodology of the THE Impact Rankings can be found at https://www.timeshighereducation.com/world-university-rankings/impact-rankings-2022-methodology (which is also the source of the overview of the present paragraph). The full information on the latest methodology is available at https://the-impact-report.s3.eu-west-1.amazonaws.com/Impact+2022/THE.ImpactRankings.METHODOLOGY.2022_v1.3.pdf.

come, the more relevant the Impact Rankings and the participation in them, and the positions of the participating higher education institutions will become.

Table 2: The country distribution of EU CEE universities in the THE Impact Rankings

Year	BG	CR	CZ	EE	HU	LT	LV	PL	RO	SI	SK
2019	1	-	4	-	2	-	2	1	5	-	2
2020	1	-	5	-	6	-	4	5	7	1	4
2021	1	1	7	-	6	-	5	12	10	1	4
2022	2	2	6	-	8	3	5	15	13	2	5

Source: author's compilation based on THE Impact Rankings data (2021).

Table 3: Positions and country distribution of EU CEE universities in the THE Impact Rankings

Range	2019	2020	2021	2022
1-100	2 LV 1, SK 1			
101-200	5 CZ 2, HU 2, RO 1	2 HU 1, LV 1		1 LV 1
201-300	4 LV 1, PL 1, RO 2	6 CZ 1, HU 1, LV 1, RO 2, SK 1	3 HU 1, LV 2	3 CZ 2, LV 1
301-400	(Category: 301+) 6 BG 1, CZ 2, RO 2, SK 1	6 HU 1, LV 1, PL 2, RO 1, SK 1	5 HU 2, LV 1, RO 1, SK 1	6 CR 1, CZ 2, LV 1, RO 2
401-600		13 BG 1, CZ 2, HU 2, LV 1, PL 3, RO 3, SI 1	9 CZ 4, HU 1, RO 3, SK 1	6 CR 1, CZ 1, HU 3, RO 1
601-800		(Category: 601+) 6 CZ 2, HU 1, RO 1, SK 2	15 BG 1, CZ 1, HU 2, LV 1, PL 3, RO 4, SI 1, SK 2	10 BG 1, HU 2, LV 1, PL 4, RO 1, SK 1
801-1000			14 CR 1, CZ 2, LV 1, PL 8, RO 2	15 HU 1, LT 1, LV 1, PL 6, RO 3, SI 2, SK 1
1001+			1 PL 1	20 BG 1, CZ 1, HU 2, LT 2, PL 5, RO 6, SK 3
Total	17	33	47	61

Source: Author's compilation based on THE Impact Rankings data (2021).

Table 3 presents the position of EU CEE-11 universities in the THE Impact Rankings in all four years. Due to the steady increase in the number of participating institutions worldwide, results are not directly comparable: a certain (e.g., top 200) position in 2022 (with 1406 universities participating worldwide) can be considered more valuable than the same position in 2019 (with 467 universities participating worldwide). The broadening of the circle of participating institutions also explains some seemingly 'deteriorating' positions; participation itself, however – especially regarding the novelty of the ranking – is a positive thing.

5 Discussion and Conclusion

Very basic analysis of the overall performance of the EU CEE-11 countries' universities shows a few characteristics that are in line with the general trend observable in the THE Impact Rankings:

- Every year, more and more higher education institutions use the opportunity to participate.
- The universities that have already been listed (with very rare exceptions) continue their participation in the rankings.
- In line with the increasing participation, it becomes more difficult – but as the data show, by far not impossible – to get into the upper categories of the rankings.

Of course, there is much room for more activity in higher education – in general and in the EU CEE-11 countries – in the field of sustainable development. The THE Impact Rankings can contribute to enhance the visibility of the universities which is crucial for them in the competition that characterizes the higher education market. There are also other possibilities to show an institution's commitment to sustainable development[2], but the visibility gains from the ranking with the relatively small efforts that are needed for it can make it attractive for more and more universities.

[2] An important example of that is the UN Principles for Responsible Management Education (PRME) Programme with over 800 signatories from all over the world. For 2023, 47 higher education institutions have been selected as 'PRME Champions', with 2 of them from the EU CEE-11 (one from Hungary and one from Slovenia). For details, see https://www.unprme.org/prme-champions.

Despite the short history (but at the same time: due to the high future potential) of the THE Impact Rankings, a more detailed analysis of their results provides interesting research opportunities. During further research, special attention should be paid to the following aspects:

- The performance of the participating universities against the individual SDGs – which of them are the most/least 'popular' (present in most/least cases in the top 3 SDGs of the institutions)?
- The performance of EU CEE-11 universities regarding the individual SDGs – are there some specific 'CEE patterns', special approaches, or do these institutions follow paths that are similar to the general approach of universities worldwide to the issue of sustainable development?
- With the stabilization of the number of participants expected in the future, the deeper analysis of the positions in the rankings – how can the participating universities maintain or improve their positions in the rankings?

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Sustainability Evaluation of the Supply Chain Under the GreenPact: A Framework Proposal for the Textile Sector

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Abstract Sustainable development is a very broad and rich concept that refers to a global development model that presupposes the satisfaction of humanity's current needs without compromising its future. With the growing globalization, there has been a greater concern with promoting sustainable economic activities internally and in supply chains. Aligned with these concerns, this research study proposes to develop a framework for the analysis and classification of the companies` socio-environmental impacts to be integrated in the GreenPact. This is a digital sustainable supply-chain-as-a-service platform that promotes the creation and availability of sustainable products through the relationship between brands and manufacturers, thus fostering the development of more sustainable value chains. The project supporting this study is the result of a research partnership with Zenithwings, a high-tech company focused on providing services related to Research & Innovation in the areas of Precision Agriculture and Industry 4.0. It is intended that this research contributes to a greater awareness of the considerable socio-environmental impacts of the supply chains in the textile sector. It is also expected to highlight the importance of using performance indicators as key tools to verify whether companies adopt good practices for mitigating socio-environmental impacts.

Keywords: sustainable development, sustainability, textile, supply chains, socio-environmental impacts, business assessment and classification

JEL: L67, Q55, Q56

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1 Introduction

The concept of sustainable development (SD) has distinct interpretations according to the researchers' addopted approaches. In this research it is considered that SD refers to a global development model, characterized by the use of scarce natural resources to satisfy people's current needs without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987). Hák et al. (2016) have argued that transforming global society, environment and economy to a sustainable one is one of the most uphill tasks confronting humanity today. Since supply chains (SCs) are networks of companies and people, directing efforts towards the common good is extremely important (Egels-Zandén & Hansson, 2016). The management of material, information, and capital flow as well as cooperation among companies throughout the supply chain (SC), considering the Triple Bottom Line (TBL), is crucial (Seuring & Muller, 2008). TBL addresses the required balance between the economic, social, and environmental dimensions of Sustainability (Seuring & Muller, 2008). Organizations have sought to integrate sustainability goals into their internal operations and SCs to respond to pressure from various stakeholders, to ensure compliance with legal requirements established by government and/or to improve their performance and/or gaining competitive advantage (Khan et al., 2021).

The globalization of the textile industry has leveraged the complexity of SCs. The SCs of textile companies are globally dispersed and characterized by a strong social and environmental impact. This has put these companies under the spotlight when it comes to their involvement in social and environmental issues (Fraise & Seuring, 2015; Oelze, 2017). Many companies have made efforts to make their activities more sustainable. However, as pointed out by Oelze (2017), due to the characteristics of this sector "enhancing sustainability along the supply chain is often difficult". Although there is a lot of research on sustainability in the textile sector, the focus has been on the environmental dimension. Furthermore, there seems to be a lack of research focusing on the whole SC and sustainability (Gbolarumi et al., 2021; Li & Leonas, 2022). Studies addressing the performance assessment have been also privileged the environmental dimension and focused on some parts of the SC (Gbolarumi et al., 2021). Therefore, a research question is defined: what are the main indicators to evaluating the sustainability of companies in the textile sector in a SC perspective?

This research study proposes an experimental framework to evaluate the sustainability of companies' SCs in the textile sector, using performance indicators, allowing to verify if companies adopt good practices for minimizing socio-environmental impacts. This framework emerges as an output of part of project with Zenithwings, a Portuguese company that focuses on developing solutions for the Precision Agriculture and Industry 4.0 sector, to develop a digital sustainable supply-chain-as-a-service platform to the textile industry: the GreenPact. Information sharing facilitated by the use of information and communication technologies is an important enabler for the sustainability of SCs. These technologies play an important role in addressing supply and demand and in decision-making to configure and plan the SCs (Oelze, 2017). GreenPact mixes technology with sustainability, to improve the sustainability of production processes, which can be through the exchange of information in a SC, such as the assessment of socio-environmental factors of companies, to support decision-making.

The reminder of this study is organized as follows: after an introducing, section 2 presents a literature review. In section 3 it is presented the methodology. Following, section 4 describes the proposed framework for the assessment of organizations` socio-environmental impacts. Finally, the paper ends with a brief discussion and the mains conclusions.

2 Literature Review

Worldwide, countries are expected to promote an economic growth, by respecting the social and environmental concerns defended in the UN approach of SD. This concept is already an integral part of many businesses in different economic sectors and is involved in all stages of the manufacturing process, from the raw material supplier to the customer (Hassan et al., 2023).

The textile industry has become an extremely important sector, valued at three trillion dollars, and employing, directly or indirectly, one in six people in the world. It is estimated that the textile and fashion sector represent around 8% of global emissions of CO_2 (Accenture, 2022). The process of globalization of the textile sector affected SCs in different ways. Firstly, the relocation of manufacturing sites entailed a heavy environmental burden due to the great distances covered by transport to deliver products that respond to the new consumption behavior:

demand for greater variety and affordability of products. Secondly, many of the suppliers are in developing countries that have not only environmental regulations, but also less strict social ones (Köksal et al., 2017). On the other hand, textile firms offer products that have a significant social and environmental impact during their lifecycle (Oelze, 2017). Each stage of the SC is linked to specific considerations regarding sustainability. Clancy et al. (2015) highlight the impact of activities that take place in the upstream SC such as raw material sourcing, yarn or fabric production, or the manufacturing of the final product. For example, in the production processes, particularly in the dyeing, drying, and finishing phases, chemical products and non-renewable natural resources are intensively used, which harm the environment (De Brito et al., 2008). In addition, the use of some raw materials (e.g., fibres such as cotton, wool, or synthetic fibres) have a very significant environmental impact since they require a lot of water, pesticides, or energy in their transformation (Caniato et al., 2012). Therefore, it is essential to consider sustainability not only internally but from a SC perspective. Incorporating sustainability into the SC is becoming a key priority to many textile companies (Shen et al., 2017). In this line, Pichlak and Szromek (2022) argue that it is crucial that companies develop efforts to implement a sustainable system between production and the consumers, which requires the creation of eco-innovative products. However, the sector that lacks innovation to increase the efficiency of the SC, and solutions for end-of-life products.

Several instruments have emerged to guide organizations in the sustainability integration process (e.g., GRI Guidelines, Dow Jones Sustainability Index, ESG criteria, ISO 14001) with different approaches varying, among other aspects, in their purpose (reporting, monitoring, rating, management or performance assessment) (Neri et al., 2021)- For example, the "environmental, social and governance" (ESG) Criteria represent three relevant areas in companies throughout the production processes, and, as such, they feel the need to communicate the efforts they have made to minimize the socio-environmental impacts of their activity. he sustainability of a SC depends on the commitment of all those involved in a social and environmental responsibility strategy (Klimkiewicz, 2017). Several studies have sought to analyze how sustainability can be assessed in the textile sector, focusing on indicators, but without a perspective of the entire SC (Gbolarumi et al., 2021).

3 Methodology

The methodology used is Design Science Research (DSR), which is a six-phase approach that aims at devising a relevant solution (called an artefact) for a real-life field problem, bridging theory and practice (Naik et al., 2023). In Figure 1, a schematic view of the DSR process is shown duly adapted to this project. The project is currently entering phase 4. Thus, the focus of this paper are the first three phases.

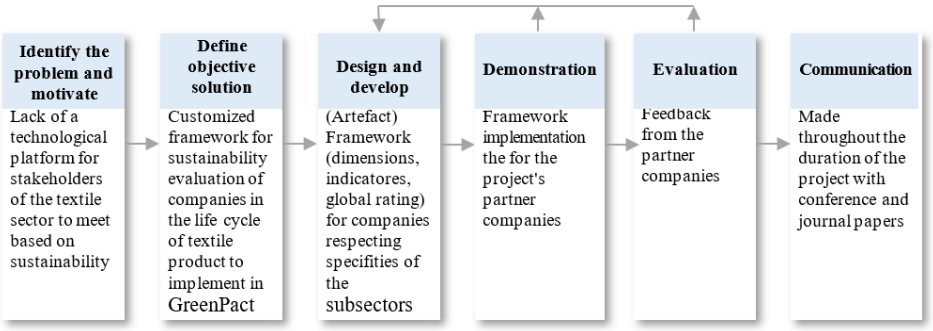

Figure 1: Project's customized DSR process
Source: Adapted from Naik et al. (2023).

Regarding the first phase, it is recognizable in the literature review. The second phase also incorporated the requirements: collect, segment and organize social-environmental indicators applicable to organizations in the textile sector, so that an assessment of related good practices can be produced and ranked based on gathered information.

For the third phase, inspiration was drawn from literature review and rating agencies, such as MSCI Inc., S&P Global Inc., FTSE Russell, Refinitiv, ISSInc., and ECPI S.r.l. These agencies are specialized in collecting and processing data, with the aim of providing relevant information to stakeholders, whether investors, managers or the final consumer. For this purpose, they develop systems for evaluating and classifying companies, in part based on non-financial information, like the one linked to sustainability. In this context, the framework was designed in three stages: i) the first was the unfolding of ESG criteria; ii) the second was the selection of the

performance indicators; and iii) the third was subsequent integration into the textile product SC.

4 Results: Framework Proposal

The proposed framework for this project has the final goal of structuring Zenithwing's GreenPact technological platform regarding the textile sector.

Criteria	Sub-criteria	Indicators	Textile Supply Chain Stages*							
			1	2	3	4	5	6	7	8
Environment	Climate Change	Amount invested in research and development projects for environmental protection, % net sales	√	√	√	√	√	√	√	√
	Climate Change	Operation in sensitive areas of fauna and flora	√	√	√	√	√	√		√
	Water Consumption	Volume of water consumption, m^3	√	√	√	√	√	√	√	√
	Water Consumption	Proportion of recycled or reused water, %	√	√	√	√	√	√	√	√
	Water Consumption	Amount of toxic waste, mg/m^3	√	√	√	√	√	√		√
	Pollution & Waste	Atmospheric, water and soil pollution, mg/m^3	√	√	√	√	√	√	√	√
	Pollution & Waste	Proportion of recycled waste, %	√	√	√	√	√	√	√	√
	Pollution & Waste	Number of toxic, carcinogenic and non-carcinogenic molecules released, mg/m^3	√	√	√	√	√	√		√
	Pollution & Waste	Use of land for agriculture, livestock and landfills, m^2	√							√
	Pollution & Waste	Prospecting for minerals and fossil resources	√							
	Pollution & Waste	Correct treatment of end-of-life products								√
	Emissions	Energy consumption, *mw*	√	√	√	√	√	√	√	√
	Emissions	Percentage of energy from renewable sources, %	√	√	√	√	√	√	√	√
	Emissions	Carbon offset	√	√	√	√	√	√	√	√
Social	Product Liability	Failures in the application of the general data regulation							√	
	Product Liability	Accidents caused by the product							√	
	Health & Safety	Accidents at work in one year	√	√	√	√	√	√	√	√
	Health & Safety	Total expenditure on product safety, % net sales							√	
	Human Capital	Discrimination occurrences	√	√	√	√	√	√	√	√
	Human Capital	Fulfilment of employment contracts	√	√	√	√	√	√	√	√
	Human Capital	Percentage of employed women, %	√	√	√	√	√	√	√	√
	Human Capital	Risk assessment for employees	√	√	√	√	√	√	√	√
	Human Capital	Fulfilment of universal basic rights	√	√	√	√	√	√	√	√
	Human Rights	Freedom to unionize	√	√	√	√	√	√	√	√
	Human Rights	Using child labour or forced labour	√	√	√	√	√	√	√	√
Governance	Transparency & Reporting	Communication of sustainability reports	√	√	√	√	√	√	√	√
	Transparency & Reporting	Hiring external and independent audits	√	√	√	√	√	√	√	√
	Transparency & Reporting	Supplier sustainability control	√	√	√	√	√	√	√	√
	Transparency & Reporting	Apply anti-corruption measures	√	√	√	√	√	√	√	√
	Corporate Governance	Communication of financial reports	√	√	√	√	√	√	√	√
	Corporate Governance	Timely payments to suppliers and employees	√	√	√	√	√	√	√	√
	Corporate Governance	Collaboration with local communities	√	√	√	√	√	√	√	√
	Corporate Governance	Ambition in sustainable development	√	√	√	√	√	√	√	√

Note *: Textile supply chain stages: 1: Raw material; 2: Raw material to fibre; 3: Yarn preparation; 4: Grey fabric; 5: Finished fabric; 6: Apparel; 7: Use phase; 8: End-of-life

Figure 2: Framework to Sustainability Evaluation of the Supply Chain in the Textile Sector

Source: Authors' research

The unfolding of ESG criteria is the theoretical cornerstone of the framework (see Figure 2). It provides structure, transparency and simplicity to the system. It was the result of a detailed analysis of the sub-criteria used by the rating agencies listed above. For the "Environment" criterion, the rating agencies under study tend to present a sub-criterion related to energy consumption, including CO_2 emissions; another sub-criterion is related to water consumption; a third criterion is related to pollution and

waste; and another broader topic is considered which be related to companies' investment in the environment, environmental opportunities, actions to combat climate change or even biodiversity. For the "Social" criterion, rating agencies commonly distinguish respect for human rights, human capital, occupational health and safety, and product liability. This criterion also highlights the relationships with the companies' surroundings, whether suppliers, stakeholders or the community. As for the "Governance" criterion, the two sub-criteria stand out, namely corporate governance and fiscal and ethical transparency. Figure 2 presents the proposed framework.

5 Discussion and Conclusion

SCs as organizational ecosystems must be managed with conscience to reduce socio-environmental impacts. In the specific case of the textile sector, the wide range of agents in the SCs make it difficult to objectively assess all the productive processes and companies involved and exacerbates the difficulty of specifying indicators for this sector. The GreenPact platform aims to facilitate communication between companies and contemplate the possibility of their rating. Considering the diversity of existing assessment instruments, the proposed framework, grounded on ESG criteria, summarizes the main indicators to assess the impacts on the different stages of the textile SC. This framework intends to be comprehensive enough to integrate the most important evaluation criteria, requirements of the GreenPact project. One of the main challenges in expanding the platform is approaching in detail the indicators to evaluate the companies. This may constitute a limitation of our study, as the framework may ignore some important indicators for these companies. Future research should validate this proposal with companies in the textile sector.

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EXAMINING SUCCESS FACTORS OF HUNGARIAN SMES DURING MULTIPLE CRISES

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Abstract The aim of this paper is to shed light on the effects of the crises on the SMEs and to identify the strategies that have proved resilient. The analyses are based on two representative surveys on Hungarian SMEs – the first conducted just after the first wave of COVID-19 pandemic in May of 2020, while second during the energy crisis and the Ukrainian war in 2022. The results show that although almost half of the SMEs' operation were affected by COVID-19 after the first wave in 2020, they focused on retaining their employees. In addition, companies that were better prepared (e.g. with a contingency plan) and those that were in a better situation before the pandemic were able to react more smoothly to the new situation or even benefit from it. Nonetheless, firms did not have enough capacity to engage in digitalisation projects. In the case of the war in Ukraine, the logistic regression model shows that the effect on firms are affected by (1) the previous situation of the business, (2) the available business opportunities, (3) the respondent's opinion on the significance of luck in business success, and (4) the change in the amount of bank loans.

Keywords:
crisis management, SMEs, COVID-19, success factors, Ukrainian war

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L26, C12

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1 Introduction

Crises such as shutdowns and supply chain disruptions related to the COVID-19 pandemic, inflation, extreme volatility in energy prices, or even uncertainty related to the war in Ukraine will challenge the resilience of the whole economy in the 2020s. While corporations generally have established formal processes, expertise, and financial capacity to deal with abnormal situations, small businesses may find it difficult to cope. Nevertheless, small and medium-sized enterprises (SMEs) can be considered the backbone of the economy of the European Union employing almost two-thirds of the non-financial sector's workforce and generating more than half of the total value added (Eurostat, 2022). This means that understanding the success factors in this sector is crucial for effective policy making. Thus, our aim is to shed light on the effects of the crises on the SMEs and to identify the strategies that proved as resilient. Accordingly, our research questions are the following:

Q1: How the SMEs were affected by the recent crises (COVID-19 pandemic, inflation, Ukrainian war)?

Q2: What characteristics could ensure SMEs to be more resilient?

COVID-19 and the ensuing lockdowns forced the reinvention of business models. While demand in some sectors (i.e. in tourism or personal services) virtually evaporated, others achieved massive growth (Alicke et al., 2021). Furthermore, the lockdowns showed the true sensitivity of supply chains which means that maintaining competitiveness requires becoming more resilient (Hamel & Välikangas, 2003). To support corporate resilience, Bughin et al. (2021) highlight agility, the importance of innovation, the transformation of the investment twins (digitalization and sustainability), and active play in business ecosystems.

Agenda 2030, a 15-year United Nations framework, was launched in 2015 and signed by 193 member states with the aim of promoting sustainable development around the world. The Agenda has developed a system of specific goals (Sustainable Development Goals, SDGs), targets and indicators, thus it can be considered the most comprehensive program for both developed and developing countries (United Nations, 2015). As the SDGs are the result of a political process, the framework has some shortcomings: (1) there are overlaps and correlation between goals and targets

(Guijarro & Poyatos, 2018; Szennay et al., 2019); (2) developed countries have already met 70 percent of the criteria at the beginning of the Agenda (Muff et al., 2017); (3) due to the number, complexity and interconnectedness of the SDGs it is not easy for companies, especially SMEs to explore which SDGs they are affected by and to which SDGs they can contribute to; (4) although the SDGs cover social, environmental and economic domains of sustainability; Ritala et al. (2021) suggest that economic domains are generally over-emphasized in value creation processes due to institutionalized asymmetries.

However, another aspect economic sustainability (see SDG 8 Decent work and economic growth) could mean saving workplaces, which contributes to the well-being and financial security of households, in other words, societal sustainability (see SDGs 1-5).

2 Methodology

Our analysis is based on the Budapest Business School SME Surveys of 2020 and 2022. Both surveys done by a professional market research company and consisted of 500 items and were representative of the Hungarian SMEs with between 3 and 99 employees. In other words, the population, on which the samples are based, is similar, but samples are cross sectional, so longitudinal analyses cannot be conducted in an easy way. The original aim of the survey was to provide a statistically based estimate of the number of Hungarian family businesses, but also included questions on some additional topics, such as financial literacy, innovation, family business governance and succession or even sustainability activities. As the 2020 survey was conducted immediately after the first wave of the COVID-19 lockdown, while the second one was conducted during the energy crisis and the Ukrainian war in 2022, some other questions were added to the questionnaire to better understand the reactions of the businesses to the ongoing crises. In case of the pandemic, the new questions concerned the impact on the business (what kind of measures was done to cope the pandemic, how was the firm affected, etc.) and its possible positive outcomes (e.g., new products or services, new processes, digitalization, etc.). Similarly, the questionnaire comprises of question on the general effect of the war on businesses measured on a five-point Likert-scale and detailed questions to analyze on what channel (e.g., rising input prices, volatility of foreign exchange rates, uncertainty concerning energy prices, etc.) were they affected. Our findings are based

on statistical analysis which was conducted using the SPSS 27 software. Descriptive statistics such as frequencies, cross-tabulations between variables and correlation analyses were used to gain a better understanding of the survey data. Furthermore, a multinomial logistic regression model was calculated to explore the factors that could influence the impact of the COVID-19 crisis in 2020, while a bivariate logistic regression model was calculated in the case of the dual crisis of war and pandemic. A multinomial logistic regression model was considered the most appropriate method as it allowed the effects of more variables to be tested in one model and the survey included variables on a nominal scale. The use of a bivariate logistic model can be explained by the fact, that only a subsample of impacted firms was used with a relatively small number of observations (n=95) and the independent variable is bivariate, namely whether the crisis had a positive or negative impact on the firm.

3 Results

The results show that almost half (49.1%) of Hungarian SMEs' were affected by COVID-19 after the first wave in 2020, while 5.7 percent reported a positive impact on their business activities. Nonetheless, a significant number of them had to partially close down (35.0%) or completely cease operation (8.8%). Not surprisingly, the impacts are sector specific – there is a significant ($p<0.001$) correlation between sector and the impact of the pandemic on business operations, with two sectors (tourism and hospitality, other consumer services) being the most affected. The survey examined expected annual turnover, but only in the case of those respondents, who reported that the pandemic had affected their business operations (48.7%). In this case, however, there is no significant difference among sectors ($p=0.371$), these SMEs expected on average 76.78 percent of their annual turnover. This could be explained by the market situation of the firms just before the pandemic, but there is no significant correlation ($p=0.870$) between this situation and the impact of the pandemic.

An important finding is that despite all the uncertainties regarding the future, only a small proportion (14.5%) of SMEs reported layoffs, while the others made attempts to maintain employment in some form, for example with mandatory holidays, wage or working hour reduction. In our opinion, it is the direct consequence of the labor shortage in the second half of 2010s, thus we suggest that the vast majority of SMEs are planning for the long-term and consider the pandemic as a temporary situation.

Although extensive use of remote working / home office is considered to be one of the main consequences of the pandemic, only 16.5% of SMEs reported introducing such measures, and these are regionally concentrated in the Central Hungarian region, including Budapest.

On a more negative note, 40.9 per cent of SMEs did not react at all to the pandemic, 42.5 per cent introduced stricter health rules, while less than 10 percent developed digital consumer service or online marketing channels (8.9%), introduced new payment methods (5.5%) or launched a special, pandemic-related marketing campaign (5.1%). Thus, although digitalization boomed during the lockdowns, the vast majority of Hungarian SMEs do not even attempt to keep up with global trends.

Table 1: Independent variables of the multinomial logistic regression model – how the COVID-19 pandemic affected the operation of the firms

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	836.421	.000	0	.
Situation of the firm just prior the pandemic	848.135	11.714	20	.926
Export activity	840.836	4.415	8	.818
Existence of a crisis management plan	841.953	5.532	4	.237
Existing portfolio of products and/or services is a good basis for long-term operation	900.784	64.363	40	.009
Sector	922.656	86.235	36	<.001
Annual turnover (2019)	858.241	21.820	16	.149

Source: Own elaboration

According to our multinomial logistic regression model (see Table 1), the impact of the pandemic situation on SMEs, as the dependent variable was determined by the sector and whether the existing portfolio of products and/or services was a good basis for long-term operation, while other predictor variables, namely (1) export activity (p=0.818), (2) situation of the firm just prior the pandemic (p=0.926), (3) existence of a crisis management plan (p=0.237) and (4) annual turnover of 2019 (p=0.149) proved to be insignificant as independent variables. Accordingly, we suggest that although COVID-19 could affect the whole economy, there was a

severe impact only in the tourism and hospitality sector, so this crisis can be considered a single-sector crisis.

The subsample analyzed in the case of the 2022 survey was constructed as follows. All enterprises were excluded from the analysis if neither the war, nor COVID-19 had any impact on their activities. If a firm reported a positive impact related to the war or COVID-19 in the survey, it was considered as positively affected, all other cases were categorized negatively affected. Thus, the subsample consisted of 95 cases, of which 79 (83.2%) were negatively and 16 (16.8%) positively affected.

The constructed bivariate logistic regression model is appropriate, as all independent variables have a significant effect and pseudo-R-square measures show rather high values (Cox and Snell R square=0.453, Nagelkerke R square=0.754). The results show that four variables determine how the firms were affected by the two crises: (1) the situation of the firm 2 years ago; (2) the available opportunities on the market; (3) the opinion of the respondents on the extent to which luck influences business success in Hungary and (4) the variation of bank debts in the last 5 years.

Firms in a more negative situation in 2020 were negatively affected, while growing ones reported positive impacts. Similarly, firms with new market opportunities correlate positively with the impact of the crises. An interesting finding is that the perceived extent of luck in business success is also positively correlated with the impacts. A decreasing trend of bank debt in the last 5 years could also positively influence the perceived effect of the war and the pandemic, which could be explained by the fact, that the National Bank of Hungary started a new monetary tightening regime in the summer of 2021, thus interest rates of non-subsidized loans were much higher than in the 2010s.

4 Discussion and Conclusion

Our paper examined the success factors of Hungarian SMEs during COVID-19 and the Ukrainian war. This approach is rather original, since – as we know – there has not been made a comprehensive study on the effects of the two recent crises on SMEs yet. The results show that COVID-19 could be considered a one-sector crisis as the effects were concentrated in the tourism and hospitality sector, while all other sectors were less intensely affected. Nonetheless, firms with more sustainable

product / service portfolios reported more positive effects on their business operations. In contrast, the effects of the Ukrainian war were more widespread. According to our model, the crisis had rather positive effects on the firms, if (1) the firm was in a better situation in 2020, (2) the firm saw available market opportunities, (3) the firm reduced its bank debts in the last 5 years and (4) the respondent perceived a high influence of luck on business success in Hungary. Therefore, our policy implications are twofold. First, in case of sectoral crises, countries should focus on saving workplaces in the affected sectors, while aid to other sectors could be limited. Second, successful SMEs may find business opportunities in more widespread crises, so they can be considered as future-proof. Therefore, policy should focus on supporting them.

Our paper has three major limitations. First, both surveys were conducted at the beginning of the crises, namely at the end of the first wave of COVID-19 and just a few months following the Russian intervention, so respondents may only have expectations about the real economic consequences of the crises. Second, national protectionism and related expectations may change the behavior of SMEs. Third, although energetic transformation was promoted by the various programs (e.g., subsidies for energetic retrofitting of buildings or for installation of photovoltaic panels), the survey does not reflect this issue. Nevertheless, it would be methodologically impossible to obtain a representative sample in this respect.

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Factors Influencing Entrepreneurs' Decision-making Concerning SDGs

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Abstract Many studies highlight the importance of entrepreneurs in achieving SDGs. While their role is undeniable, mapping their motivations to act according to SDG principles is still in its infancy. The aim of this study is to examine whether the environment surrounding entrepreneurs, their characteristics, and their motivation for starting a business are related to whether SDGs are considered in business decisions. Following a review of the relevant literature, the paper provides empirical evidence for the existence of the hypothesized relationships. The 215-item database of the Hungarian Global Entrepreneurship Monitor Adult Population Survey 2022, restricted to business owner-managers, was used. Chi-Square test and correlation analysis were applied to analyse the relationship between sustainability decisions and the environment, personal characteristics, and start-up motivations of owner-managers. The research shows a relationship between entrepreneurial decisions made with sustainability in mind and the entrepreneur's environment, personality, and motivation to start a business.

Keywords:
entrepreneurship, SDGs, Global Entrepreneurship Monitor, GEM, Hungary

JEL:
L26, L31, Q56

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1 Introduction

Scientists have proposed the term 'Anthropocene' for the current geological epoch, given the increasing impact of human activities on the Earth and its atmosphere (Crutzen & Stoemer, 2000). The Anthropocene marks a fundamental shift in the relationship between humans and the Earth system as humans are not passive observers of Earth's functioning (Lewis & Maslin, 2015). Rockström et al. (2009) defined nine planetary boundaries: (1) climate change, (2) ocean acidification, (3) stratospheric ozone depletion, (4) interference with the global phosphorus and nitrogen cycles, (5) rate of biodiversity loss, (6) global freshwater use, (7) land-system change, (8) aerosol loading, and (9) chemical pollution, at least three of which humanity has already transgressed (rate of biodiversity loss, interference with the global phosphorus and nitrogen cycles, climate change). The challenge for humanity is to meet the needs of all people within the means of the planet (Raworth, 2017). To achieve this goal, the United Nations (2015) is leading the transformation to put the world on a sustainable and resilient path. The 2030 Agenda for Sustainable Development, published in 2015, defines 17 Sustainable Development Goals (SDGs). The 17 SDGs were adopted form a global framework covering the social, economic, and environmental dimensions of sustainable development. The Agenda 2030 explicitly calls on businesses, including micro-enterprises and multinationals, to contribute to sustainable development (United Nations, 2016).

Pomar (2018) highlights the importance of SMEs in achieving the SDGs, citing their significant number, role in employment and contribution to GDP. Schaltegger and co-authors (2018) emphasize that entrepreneurship is very important for sustainability because the transformation to a sustainable future urgently requires the creative destruction of unsustainable patterns of production, consumption and living. Venancio and Pinto (2020) come to the opposite conclusion, finding that entrepreneurship contributes negatively to the achievement of the SDGs in the case of necessity and non-innovative entrepreneurship. Dhahri and co-authors (2021) further explore the issue and conclude that opportunity entrepreneurship has a positive impact on the three dimensions of sustainable development, while necessity entrepreneurship has a negative impact on the environmental sustainability dimension.

Table 1 summarizes the role of entrepreneurship in achieving sustainable development (SD).

Table 1: Role of entrepreneurship in achieving sustainable development.

SD Dimension	Entrepreneurship contribution
Economic	"(. . .) entrepreneurship drives economic growth by creating jobs, promoting decent work and sustainable agriculture and fostering innovation"
Social	Entrepreneurship can make a positive contribution to "promoting social cohesion, reducing inequalities and expanding opportunities for all, including women, young people, persons with disabilities and the most vulnerable people"
Environmental	"(. . .) entrepreneurship can help to address environmental challenges through the introduction of new climate change mitigation and adaptation technologies and resilience measures, as well as by promoting environmentally sustainable practices and consumption patterns"

Source: Filser et al. (2019, 2).

Scholars suggest that adoption of a sustainable strategy in entrepreneurship leads to greater resilience and long-term performance (Avery & Bergsteiner, 2011; Moya-Clemente et al., 2019; DiVito & Bohnsack, 2017; Johnsen et al., 2018).

Sustainability-oriented entrepreneurs may be motivated primarily by a desire to contribute to sustainable development, rather than by conventional profit maximisation. This motivation is often closely linked to the entrepreneur's personal values and passion for sustainable business (Schaltegger et al., 2018). Nevertheless, the pursuit of environmental protection does not mean a reduction in profitability, according to the model of Schaltegger and Synnestvedt (2002) environmental protection can support economic success.

Our research seeks to answer the question of what factors influence the decisions of micro and small enterprises in relation to the SDGs.

The rest of our paper presents the data, methods used, the hypotheses formulated and the analysis. After highlighting the results of the research, in the conclusion the main findings, limitations of the research and future research directions are presented.

2 Methodology

The aim of our paper is to contribute to the topic of entrepreneurs achieving the SDGs by analyzing data from the Hungarian Global Entrepreneurship Monitor (GEM) Adult Population Survey (APS) 2022. GEM conducts survey-based research on entrepreneurship and entrepreneurship ecosystems around the world by collecting data on entrepreneurship directly from individual entrepreneurs. The APS examines the role of the individual in the life cycle of the entrepreneurial process. The APS is administered to a nationally representative sample of at least 2000 adults in each economy. Data collection for the APS is coordinated centrally, thus all surveys are subject to several quality assurance checks before data collection begins. The resulting data are repeatedly checked before publication (https://www.gemconsortium.org/).

Data from the 2022 GEM Hungary APS have been used in the course of our work. The initial sample size of the database was 2014, from which business owner-managers (n=215; owner-managers are respondents who, alone or with others, own a business that they help to manage or are self-employed, regardless of its nascent, new or established status.) were selected for analysis and to test the following five hypotheses:

H1a: Business owners who are aware of the UN's SDGs are more likely to take steps to minimize the environmental impact of their business.
H1b: Business owners who are aware of the UN's SDGs are more likely to take steps to maximize the social impact of their business.

H2: There is a positive correlation between the consideration of the social implications of decisions and the motivation to start a business – "to make a difference in the world".

H3: There is a positive correlation between the consideration of the environmental implications of decisions and the innovativeness of owner-managers.

H4: There is a positive correlation between the prioritization of the social and/or environmental impact of the business above profitability or growth and the motivation to start a business – "to make a difference in the world".

The non-representative subsample contains small and medium-sized enterprises, where the average number of employees is 2.75 and the maximum number of employees is 45.

A quantitative approach was used for the analysis. All variables included in the analysis (see Table 2) were measured on a five-point Likert scale. Descriptive statistics, chi-square test and Spearman's correlation analysis were used to analyze the relationship between entrepreneurial motivation, personal characteristics, environment and owner-managers' decisions on sustainability dimensions.

Table 2: Descriptions of variables

Variable	Variable name	Description
Entrepreneurial networks	KNOWENT	How many people do you know personally who have started a business or become self-employed in the past 2 years? Would it be none, one, few or many people?
Innovativeness	CREATIV	Other people think you are highly innovative.
Long term thinking	VISION	Every decision you make is part of your long-term career plan.
To make a difference in the world	SUMOTIV1	Please indicate to what extent the following statements reflect the reasons why you are involved in this business. To make a difference in the world.
To build great wealth or a very high income	SUMOTIV2	Please indicate to what extent the following statements reflect the reasons why you are involved in this business. To build great wealth or a very high income
Social implications	SUSDG_SOC	When making decisions about the future of your business, you always consider social implications such as access to education, health, safety, inclusive work, housing, transportation, quality of life at work, etc.
Environmental implications	SUSDG_ENV	When making decisions about the future of your business, you always consider environmental implications such as the preservation of green areas, reduction of the emission of pollutants and toxic gases, selective garbage collection, conscious consumption of water, electricity and fuels, etc.
Social and/or environmental impact outweigh profitability or growth	SUSDG_PRI	You prioritize the social and/or environmental impact of your business over profitability or growth

Source: Authors' research.

3 Results

Only 24.3% of the Hungarian entrepreneurs surveyed are aware of the 17 United Nations Sustainable Development Goals, while 67.7% of those who are familiar with the SDGs claim that they are a priority for their company. 60.1% of the entrepreneurs in the sample took steps to minimize the environmental impact of their business in the past year, however, increasing the social impact of their business is considerably lower (38.4%).

Using the Chi-Square test, we examined whether awareness of the SDGs had a positive effect on minimizing the environmental impacts and maximizing the social impacts of the companies surveyed. The relationship between SDG awareness and steps taken to minimize the business' environmental impact was significant ($X^2(1, N=208) = 5.031$, $p=0.025$). Entrepreneurs, who are aware of the SDGs are more likely to take steps to minimize the environmental impact of their business. The relationship between SDG awareness and steps taken to maximize the business' social impact was not found to be significant ($X^2(1, N=206)=3.791$, $p=0.52$).

Correlation coefficients were calculated to assess the linear relationship between social implications, environmental implications, social and/or environmental impact over profitability or growth and entrepreneurial networks, innovativeness, long-term thinking, "To make a difference in the world" motivation, „To build great wealth or a very high income" motivation (see Table 3).

Social implications showed a positive correlation with entrepreneurial networks, long-term thinking, and "To make a difference in the world" motivation. There was a positive correlation between environmental implications and "To make a difference in the world" motivation. Social and/or environmental impact over profitability or growth showed a positive correlation with innovativeness and the "To build great wealth or a very high income" motivation.

Table 3: Results of the correlation analysis

		Entrepreneurial networks	Innovativeness	Long term thinking	To make a difference in the world	To build great wealth or a very high income
Social implications	Correlation Coefficient	.239**	0.016	.161*	.349**	0.086
	Sig. (2-tailed)	0.000	0.822	0.014	0.000	0.191
Environmental implications	Correlation Coefficient	0.105	0.050	0.063	.223**	0.068
	Sig. (2-tailed)	0.109	0.475	0.339	0.001	0.297
Social and/or environmental impact outweigh profitability or growth	Correlation Coefficient	0.052	.173*	0.102	0.122	.140*
	Sig. (2-tailed)	0.435	0.014	0.124	0.065	0.034

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

4 Conclusions

The research findings confirmed that business owners who are aware of the UN SDGs are more likely to take steps to minimize the environmental impact of their business, but at the same time did not substantiate the claim that business owners who are aware of the UN SDGs are more likely to take steps to maximize the social impact of their business.

The results of our research reveal that entrepreneurs who consider social impact in their decision-making process are more embedded in the entrepreneurial community, their decisions are part of their long-term career plan and their strong motivation for starting a business is to make a difference in the world. Entrepreneurs who consider environmental impacts are also characterized by a desire to make a difference in the world.

Entrepreneurs who prioritize the social and/or environmental impact of their business over profitability or growth consider themselves to be innovative and building great wealth or a very high income is their strong motivation for starting a

business. The results are consistent with those found by Schaltegger et al. (2018) and Schaltegger and Synnestvedt (2002).

The originality of the paper lies in that it sheds light on the little-studied relationship between entrepreneurs' decisions on sustainable development and their environment, personality and motivation to start a business.

The study's main limitation is that only one economy was examined, and the data used for the analysis were not representative, which reduces the reliability and generalizability of the results.
A comparative analysis of more countries and the creation of a sophisticated model describing the relationship between entrepreneurs' SDG decisions and their environment, personality, and motivation to start a business are promising future research directions.

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GREEN ECONOMY AND UNCERTAINTY AVOIDANCE AS A DIMENSION OF NATIONAL CULTURE

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Abstract The key objective of a green economy, as an environmentally sound, low-carbon economy, is promoting sustainable development. The latter should consider national culture, which comprises the values, beliefs, and actions of a society. The main purpose of this paper is to explore the interconnectedness of uncertainty avoidance as a national cultural dimension and the levels of green economy development. In the research, we gathered secondary data from 60 countries from different parts of the world. The data for national cultural orientations were collected from the Hofstede insights website, whereas the values for the green economy indicators were gathered from the Green Growth Index. Our research shows that countries with a high degree of uncertainty avoidance perform better in green trade, green employment, and green innovation indicators than countries with a low degree of uncertainty avoidance. The research is based on descriptive statistical analysis. Its findings show that for some green economy indicators, there are statistical differences between different groups of countries with different levels of uncertainty avoidance, which brings important implications for policymakers and businesses.

Keywords:
green economy, national culture, intercultural differences, uncertainty avoidance, Green Growth Index, Hofstede Insights

JEL:
Q1, Q56, Z13

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1 Introduction

Over the last decade, the concept of the green economy has become a strategic priority for national governments. By transforming their economies into so-called green systems, economies should be able to meet the key challenges of the 21st century – from excessive urbanization and scarcity of natural resources to climate change and economic instability (UNEP, 2020).

A green economy requires particular skills, capabilities, and cultural characteristics of individuals. House et al. (2004) argue that the greater the desire to avoid uncertainty, the more people seek orderliness, consistency, structure, formal procedures, or tangible laws as they help lessen the need to make one's own decisions and be responsible for uncertain outcomes. People in uncertainty-avoiding cultures solve pressing problems rather than develop long-run strategies. Firms located in countries with high levels of uncertainty avoidance are expected to be less effective innovators compared to firms located in countries with low levels of uncertainty avoidance (Holmstrom, 1989). They are likely to invest less in research projects to reduce the level of uncertainty. Even if the expenditure towards R&D is the same between high and low-uncertainty-avoiding countries, firms in high-uncertainty-avoiding countries are likely to dedicate most of these funds towards low-risk endeavors, which by definition are of lower impact (Chen et al., 2017).

Despite the importance of a green economy for the sustainable development of societies, there is a research gap in identifying the links between green economy development stages and countries' particular national cultural orientations. The main purpose of our paper is to explore the interconnectedness between uncertainty avoidance as a national cultural orientation and the level of green economy development.

2 Theoretical Background

The key objectives of the green economy, as an ecologically sound, low-carbon economy (UNEP, 2020), are to reduce environmental problems and risks and to promote sustainable development. Studies on the green economy cite a fundamental shift towards more efficient, innovative, environmentally friendly technologies that can reduce harmful emissions and the effects of climate change, while coping well

with the challenges of resource depletion and degradation of the natural environment (Janicke, 2012). Key pillars of green economy development include the need to reduce carbon emissions to minimize the risks of climate change due to the overexploitation of natural resources and large-scale degradation of the natural environment which reduce the natural capital on which humanity depends.

The shift towards a green economy requires a new mindset and an innovative way of doing business. It also requires new potential in the skills of individuals who can work competently at a cross-sectoral level in interdisciplinary teams. The acquisition and use of knowledge and skills, values, ways of thinking, and acting are elements of the cultural environment of countries.

Most of the Sustainable Development Goals (SDGs) adopted by the United Nations in 2015 (UN, 2015) emphasize the role of culture at its core. It is recognized as an important factor in the economic, social, and environmental dimensions of sustainable development. Culture represents the values, beliefs, and behavior of a society. Tylor (1870) defined culture, as "a complex whole comprising the values, beliefs, norms, customs, and habits, which the individual acquires as a member of a social group". According to Hofstede (1994), culture is "the collective programming of the mind that separates members of one group of people from another". Culture plays a direct and crucial role in achieving the strategic pillars of a country's development vision (Alwakid et al., 2020). Various authors (e.g. Ratan, 2017) have attributed economic growth to the dominant characteristics of particular national cultures.

Uncertainty avoidance, as a cultural dimension, can be explained by the level of society's tolerance to ambiguity and uncertainty (Wennekers, et al., 2007; Hancioglu et al., 2014). Countries with a high level of uncertainty avoidance refuse to face novelties, try to balance optimal stability with minimal risk, and have numerous legislations, regulations, and laws to lower uncertainty. A national culture with a high degree of uncertainty avoidance enforces codes of conduct, guidelines, regulations, and laws to reduce or manage uncertainty and unstructured situations (Hofstede, 2001). On the other hand, individuals in low uncertainty avoidance countries don't like extensive regulation. They believe that rules are not necessary to solve problems and feel bound by them (Frijns et al., 2013; Matusitz & Musambira, 2013; Hancioglu et al., 2014). A low uncertainty avoidance culture is less fearful of an unknown future

and does not rely as heavily on rule-oriented uncertainty mitigation mechanisms (Hofstede, 2001). Although low levels of uncertainty avoidance in society are often associated with unethical actions (Rallapalli et al., 1994; Song et al., 2018), which can also be manifested in companies' neglect of activities to reduce their impacts on the natural environment, societies with low levels of uncertainty avoidance are predominantly oriented towards risk-taking activities. Our hypothesis is the following:

H1: There are differences in average values in higher/lower levels of uncertainty avoidance as a national cultural orientation across countries at different stages of green economy development.

3 Methodology

Our research is based on secondary data from 60 countries on six continents. Data on the dimensions of the green economy were collected from the Global Green Growth Index (GGGI) 2020 (Zabrocki et al., 2020). The GGGI comprises four dimensions: sustainable and efficient use of resources, protection of natural capital, green economic opportunities, and social inclusion. We focus on the area of green economic opportunities which comprises green investment, green trade, green jobs, and green innovation. Green investment refers to public and private investments that directly or indirectly promote the sustainable use of resources, including materials, water, energy, and land, as well as the protection of natural capital, such as environmental protection and climate change mitigation and the promotion of sustainable development. Green trade refers to the competitiveness of a country to produce and export environmental products that can contribute to the protection of the natural environment, climate change mitigation measures, green growth, and sustainable development. Green employment refers to green jobs, created and sustained by economic activities that are environmentally friendly and offer decent working conditions. Green innovation refers to product, process, and service innovations, such as energy saving, pollution prevention, waste recycling, and green product design, as well as to firms' activities that bring environmental benefits. Data on uncertainty avoidance as a cultural dimension was gathered from Hofstede's Insights (2021). The descriptive statistical analysis was carried out using SPSS.

4 Results

Our research shows that 43 countries have high levels of uncertainty avoidance, while 17 countries record low levels in this cultural dimension (Table 1). The average value/mean of green investment in countries with high levels of uncertainty avoidance is 66.06, in the countries with a low level of uncertainty avoidance, however, 70.48. Countries with high levels of uncertainty avoidance achieve on average lower minimum levels of green investment (50.9) than countries with low levels of uncertainty avoidance (55.1). On the other hand, countries with low levels of uncertainty avoidance achieve on average higher maximum levels of green investment (80.4) than countries with high levels of uncertainty avoidance (78.7). The minimum (55.1) and maximum (80.4) values of green investment are also higher in countries with low levels of uncertainty avoidance. Therefore, the countries with a high degree of uncertainty avoidance perform worse on green investment in comparison to countries with a low degree of uncertainty avoidance. This could be explained by the example of Denmark, which records low uncertainty avoidance (23), however, it scores relatively high on green investment (78.3).

Table 1: Descriptive statistics on high/low levels of uncertainty avoidance at different development stages of the green economy

	Green investment		Green trade		Green employment		Green innovation	
	High	Low	High	Low	High	Low	High	Low
N	43	17	43	17	43	17	43	17
Mean	**66.06**	**70.48**	**26.4**	**23.74**	**49.47**	**46.14**	**42.05**	**32.34**
Median	66.88	71.52	25.74	22.54	48.88	47.42	40.63	24.6
Std. Deviation	7.25	8.21	17.25	13.99	20.36	18.39	22.19	25.97
Variance	52.5	67.40	297.55	195.91	414.56	338.36	492.46	674.34
Range	27.8	25.3	66	39	85.37	69.65	99	99
Minimum	**50.9**	**55.1**	**3**	**6**	**14.63**	**13.9**	**1**	**1**
Maximum	**78.7**	**80.4**	**69**	**44**	**100**	**83.55**	**100**	**100**

Source: Authors' research.

Notes: GGGI: Green investment - adjusted net savings, including particulate emission damage (% of Gross National Income (GNI)); Green trade - share of export of environmental goods to total export; Green employment - share of green employment in total manufacturing employment; Green innovation - share of patent publications in environmental technology to total patents; Green investment, green trade, green employment, and green innovation: (1) 1-20 very low - require significant actions to improve the situation; (2) 20-40 low - identify the right policies to coordinate development; (3) 40-60 moderate - finding the right balance for development progress; (4) 60-80 high - take a strategic position for full development; (5) 80-100 very high - achieve or nearly achieve the maximum result. Hofstede's cultural dimensions: (1) 1-50 low uncertainty avoidance, (2) 51-100 high uncertainty avoidance.

The average value of green trade, measured by the share of exports of environmental goods, is higher in countries with a high degree of uncertainty avoidance (26.4). The minimum value that appears for this indicator is 3 for countries with a high degree of uncertainty avoidance and 6 for countries with a low degree of uncertainty avoidance. This shows that the minimum value of green trade is higher in countries with a low degree of uncertainty avoidance, and the maximum value (69), however, in countries with a high degree of uncertainty avoidance. The research shows that countries with high degrees of uncertainty avoidance outperform countries with low degrees of uncertainty avoidance in green trade. For this indicator, we can cite again the example of Denmark which records a low level of uncertainty avoidance, however, its green trade is on a high level (44.2). Iceland is a similar example since it is ranked in the group of low uncertainty avoidance countries (score 50), however, it records a very low score on the green trade (5.7).

The average value of green employment, measured by the share of green employment in total manufacturing employment, is higher in countries with a high degree of uncertainty avoidance (49.47) than in countries with low uncertainty avoidance (46.14). The minimum (14.63) and maximum (100) values of green employment are also higher in countries with high levels of uncertainty avoidance. Countries with high levels of uncertainty avoidance outperform countries with low levels of uncertainty avoidance also in green employment. For this indicator, we could look at the example of Switzerland, which records a score of 58 on uncertainty avoidance, however, it achieves the highest score on green employment (100).

The average value of green innovation, measured by the share of patent publications in environmental technology, is higher in countries with a high degree of uncertainty avoidance (42.05) than in countries with a low degree of uncertainty avoidance (32.34). The minimum (1) and maximum values of green investment (100) are the same in both groups of countries. We can conclude that countries with a high degree of uncertainty avoidance outperform countries with a low degree of uncertainty avoidance on the green innovation indicator. For this indicator, we can take a look at the example of Belgium which records a very high degree of uncertainty avoidance (94), however, it records also the highest score in the green investment indicator (100).

5 Discussion and Conclusion

Our research shows that countries with a high degree of uncertainty avoidance perform better in green trade, green employment, and green innovation indicators than countries with a low degree of uncertainty avoidance. Regardless of this, however, countries with low degrees of uncertainty avoidance perform better in green trade. Based on the results of descriptive statistics, we confirmed the hypothesis that there are statistically significant differences in higher/lower levels of uncertainty avoidance across countries at different stages of green economy development. Countries at different levels of development fall into different groups according to their national cultural orientation. For example, Denmark, a highly developed country, falls into the group of countries with low uncertainty avoidance, however, it scores poorly on the green trade indicator, which is unexpected. On the other hand, Denmark records high green investment. Belgium, as a highly developed country, falls in the group of countries with a high degree of uncertainty avoidance but scores the best on the green innovation indicator, which is also unexpected.

To support the development of the green economy, it is important to put in place requisite national policies. The circumstances in which a company is operating will determine its performance and decisions; if uncertainty avoidance is high, a company will be concerned about its future. The study of Hou and co-authors (2022) implies that minimizing economic policy uncertainty is supportive of companies' green activities. Their findings show that a stable economic policy plays an essential role in a firm's green activities. Our research shows that China, for example, is doing very well on green investment, with a score of 80.4 on this indicator, while on the other three green economy indicators, it scores low or medium, which tells us that it still needs to make progress in this regard.

Due to data availability, our research was limited to a certain set of indicators, and a certain number of countries and we focused on the country's macro level. We didn't explore the factors influencing the observed cultural dimension and other factors influencing the level of green economy development. For further research, it would be useful to modify the green economy indicators or add some additional ones. It would be also worthwhile to explore companies' levels of cultural orientations and their impact on particular green economy indicators. To achieve higher robustness of the research it would be also useful to observe a longer period.

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CHALLENGES OF UKRAINE ON THE WAY TO CLIMATE NEUTRALITY

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Abstract The current ecological situation in Ukraine determines the need to overcome obstacles to decreasing greenhouse gas emissions. The aims of this research are to identify the main current challenges for mitigating the impact on climate conditions, measures to reduce greenhouse gas emissions, and possible actions by the government and businesses to attain climate neutrality. Ukraine has many challenges related to CO2 emissions due to both the sectoral structure of the economy and the high energy intensity of outdated technologies. Air pollution is significantly increasing as a result of military aggression on Ukrainian territory. The decrease in CO2 emissions is partly explained by the reduction of economic activities during the pandemic restrictions. Despite the government's implementation of measures to create favorable conditions to reducing environmental pollution, it is necessary to develop measures to increase energy efficiency and stimulate the transition of business to a circular economy.

Keywords:
climate neutrality, carbon emissions, Ukraine, circular economy, transition

JEL:
O13, P48, Q57

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1 Introduction

Global warming has become a critical issue worldwide, leading to changes in human living conditions that will make impossible or significantly limit the livability and workability of many geographical areas. As a result of drought or floods, agricultural crops can be significantly damaged, as well as buildings and infrastructure (McKinsey, 2020). Reducing greenhouse gas emissions is the main prerequisite for slowing down global warming. To this end, national economies must move towards climate neutrality. Climate neutrality is supposed to reduce greenhouse gas emissions to the level forests and oceans will be able to absorb. This entailed achieving a net balance between the generation and removal of greenhouse gases, in other words, zero emissions.

Despite the fact that most environmental pollution metrics in Ukraine are falling, the process requires additional monitoring and correction. This determines the relevance of our research and offers ways to mitigate the impact of climate change.

2 Theoretical Background

More and more countries are uniting with the aim to decarbonize and mitigate the impact of human activities on climate change. Under the terms of the Paris Agreement, countries have developed and implemented a wide range of emission reduction policies. As of January 2023, net zero carbon goals are agreed upon by 133 countries, which are responsible for almost 91% of global GDP and about 83% of global emissions. An important step for coordinated action to reduce emissions is the launch of the Inclusive Forum on Carbon Mitigation Approaches (IFCMA). The first meeting in early February 2023 gathered more than 600 representatives from 104 participating countries (OECD, 2023).

A powerful tool for the improvement of the environmental situation is the transition to a circular economy. The transition to a circular economy requires the development of infrastructure for the collection and processing of waste, which allows the use of secondary raw materials. Government support is needed through the implementation of environmental industry standards and green procurement, promotion of the circular economy concept and inclusive development model (Kraveishvili & Gogorishvili, 2022) at the state level and through the education system (Gagnidze, 2018; Lekashvili, 2019).

New technologies are an important source for the development of circular economy. The activities of startups and accelerator companies in the field of circular economy make it possible to identify the innovation trends in 2023 of the industries' development (StartUsInsights, 2023). The most influential circular economy trends & innovations are shown in Figure 1. Evidence of innovative breakthroughs in technologies for the circular economy outlines the challenge of the availability of such technologies for the economy of Ukraine, both from the point of view of investment and personnel support for implementation.

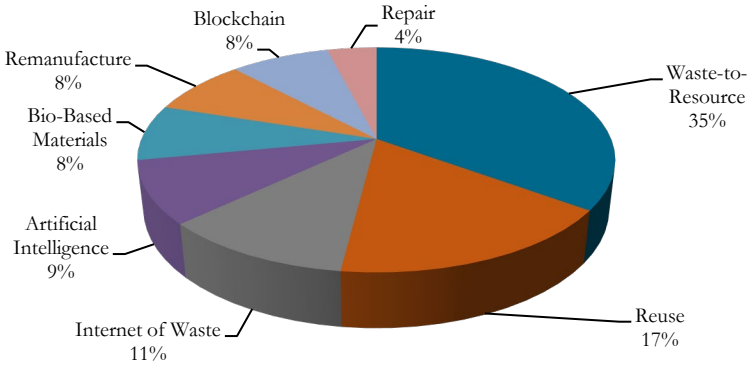

Figure 1: The most influential circular economy trends & innovations in 2023
Source: StartUsInsights (2023, January).

The UN Climate Summit COP27, which took place in November 2022 in Egypt, demonstrated the emphasis on the diversification of energy sources in the policies of countries and companies. Special attention is now focusing on renewable energy. The additional result is a reduction of the influence of energy monopolies. There is also an intensification of the development of technologies aimed at decarbonizing the economy.

The transition of the energy sector is particularly relevant for Ukraine. For the energy transition, it is necessary to increase the use of renewables. Ukraine has significant potential for the use of renewable energy sources such as solar and wind energy. Hydrogen also has great potential for Ukraine. On the way to climate neutrality, Ukraine must accelerate the transformation of the energy generation and consumption system. In order to achieve this goal, efforts should be made to simplify the procedures for obtaining access to land for the use of alternative energy

sources and clean technologies, modernizing the grid and other infrastructure, decarbonizing transport and industry, strengthening emission controls, and applying instruments that stimulate green investments (Tai et al., 2022).

3 Methodology

The research was conducted using statistical data of Ukrainian (MEPR, State Statistics Service of Ukraine, data is available until 2021) and international organizations (Our World in Data, UNECE, data is available until 2019). The current state and dynamics of the next indicators in the energy and industrial sector of Ukraine, which affect changes in climate neutrality due to greenhouse gas emissions were determined: these are Ukraine's contribution of total global greenhouse gas emissions, emissions of carbon dioxide from stationary sources, carbon intensity of energy production, and carbon emissions per unit of GDP. Operational information of state bodies of Ukraine and international organizations was used to analyze factors influencing the environmental situation and formulate conclusions.

4 Results

Analysing the impact of Ukraine's economy on environmental pollution before the war, it can be observed that the dynamics of greenhouse gas emissions show a reassuring declining trend. With a population of around 42 million (as of 2019), Ukraine contributes 0.61% of total global greenhouse gas (GHG) emissions. Air emissions of carbon dioxide from stationary pollution sources are shown in Figure 2. More than half of greenhouse gas emissions come from the electricity and heat sectors. The carbon intensity of energy production, which indicates the amount of CO_2 emitted per unit of energy, was one of the highest in Europe in 2021 (Figure 3). Despite the high intensity of emissions from Ukraine's energy sector, the growing trend of GDP till 2021 and declining GHG emissions confirmed the dynamics to reduce carbon emissions per unit of GDP. That is, this indicator in 2019 was 0.32 kg of CO_2 per constant 2010 USD, which is 8.5% less than in 2018 (UNECE, 2020).

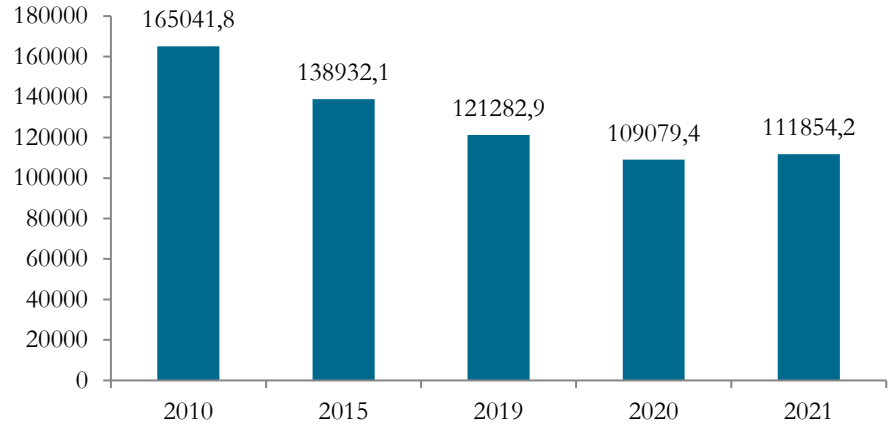

Figure 2: Carbon dioxide emissions from stationary sources, thsd.t.
Source: State Statistics Service of Ukraine (2022)

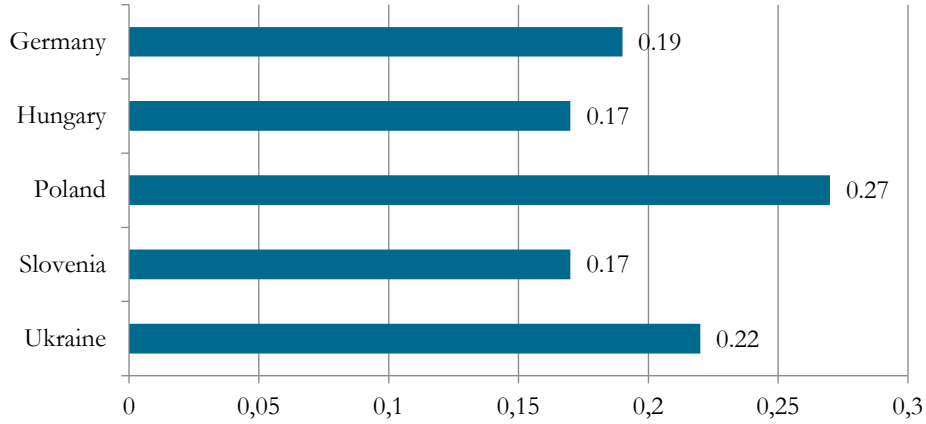

Figure 3: Carbon intensity of energy production in 2021, kilograms of CO_2 per kilowatt-hour
Source: Our World in Data (2021).

The Annual National Inventory Report for Submission under the United Nations Framework Convention on Climate Change and the Kyoto Protocol for 2021 both confirm that the energy sector is the most significant contributor to GHG emissions in Ukraine (MEPR, 2021). In 2020, the share of this sector accounted 65 % excluding LULUCF. The next most influential sector is the 'Industrial processes and product use,' which contributes about 18%, and the agriculture sector which contributes

about 13%. A big challenge for the environment is represented by outdated technologies and equipment in mature sectors of the Ukrainian economy. In 2020, the degree of depreciation of fixed assets was 55% in basic metals manufacturing, 70% in enterprises supplying electricity, gas, steam, and air conditioning (State Statistics Service of Ukraine, 2021).

4.1 Impact of the war in Ukraine

By the end of 2022, the Ministry of Environmental Protection and Natural Resources of Ukraine (MEPR) estimated the additional emissions of greenhouse gases caused by military actions on the territory of Ukraine, which amounted to about 33 million tons of CO_2eq. Emissions into the atmosphere due to forest fires, burning of oil products and the burning of industrial facilities due to attacks by Russian troops have already exceeded 67 million tons (Ukrinform, 2022). Potential indirect emissions of greenhouse gases due to the need for post-war reconstruction are estimated at about 48.7 million tons of CO_2eq (EcoBusinessGroup [EBG], 2022). The Minister of MEPR reported: "The amount of destruction waste in Ukraine due to military aggression can already be compared with the amount of solid household waste generated in the country per year on average. And this is about 10-12 million tons" (MEPR, 2023, February 10).

Despite the military operations on the territory of Ukraine, the country's government is making significant efforts to implement European legislation, comply with the requirements and recommendations of the European Green Deal and fulfill obligations under the Paris Agreement. Over the past year, changes to laws in the areas of waste management, forestry, water policy, strengthening of chemical safety, environmental monitoring, etc. were put into effect. Ukraine persistently adheres to the principles of the European Green Deal. The emphasis in their implementation is on private investments in renewable energy, mining, transport infrastructure, construction, and other sectors of the economy (Cabinet of Ministers of Ukraine (CMU), 2023).

The Cabinet of Ministers of Ukraine approved the Water Strategy of Ukraine until 2050 and the operational plan for its implementation until 2024. Such an initiative is an important step towards the fulfillment of Ukraine's international obligations in the field of "water" security, the Association Agreement between Ukraine and the

EU, and the Resolution of the UN General Assembly named Global Sustainable Development Goals by 2030.

In June 2021, the President of Ukraine signed the Law "On limiting the circulation of plastic bags in the territory of Ukraine". The Committee of the Verkhovna Rada on Environmental Policy and Nature Management considered the revised law 6077 "On measures to prevent and reduce the negative impact of plastic products on the environment", which prohibits the circulation and distribution of single-use plastic products (EBG, 2023, February 3).

The Verkhovna Rada of Ukraine made amendments to the Law of Ukraine "On Alternative Fuels." In January 2023, a biomethane register was launched, allowing producers and consumers of this renewable gas to obtain guarantees and certificates of biomethane origin (EBG, 2023, January 23). Quick submission of a waste declaration is possible through the Unified Environmental Platform "EcoSystem". There were changes in the procedure for environmental impact assessment during martial law.

An important step towards climate neutrality is the opening of the Ukrainian Climate Office in 2022, which will provide support to the government of Ukraine, cities, and regions, as well as businesses to overcome challenges on the way to the climate goals implementation. Financing will be provided by the European Union and the International Climate Initiative of the Federal Ministry of Economy and Climate Protection of Germany (Ukrinform, 2022).

5 Discussion and Conclusion

Ukraine, just like most countries of the world, faces the urgent task of reducing greenhouse gas emissions in order to slow down global warming. Ukraine's official position is to accept and adhere to the principles of the Paris Agreement. However, implementing such a policy requires overcoming a significant number of challenges. An important vector is the development of renewable energy (Sobolieva & Harashchenko, 2020), the share of which has increased significantly over the past 10 years but is insufficient for the needs of the transition to climate neutrality. In addition to the energy sector, modernization and renewal of the Ukrainian industries require significant investment.

Considerable potential on the way to climate neutrality can be realized by increasing the energy efficiency. The energy sector is the most carbon-intensive part of Ukraine's economy, therefore more attention should be paid to reducing emissions in the energy sector. An important prerequisite for this is the transition to a circular economy. This approach provides an opportunity to realize the inclusive model of economic growth.

Ukraine needs significant efforts to decarbonize the economy, as it has to overcome significant barriers on this path. It is necessary to jointly intensify the efforts of the government and businesses on the way to climate neutrality. The Ukrainian government constantly implements measures to improve legal and regulatory norms and mechanisms to support the circular economy and invest in infrastructure development.

Effective tools for encouraging enterprises to introduce new environmental technologies, increase energy efficiency, and assess the environmental footprint of products and services require further research. Another issue for discussion is about finding ways to increase the awareness of the Ukrainian population regarding the consequences of climate change, and the need to comply with the norms of ecological consumption and the use of resources.

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Social Protection Intervention to Attain Sustainable Development Goal One in Albania

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Abstract One of the principles of the United Nations 2030 Agenda, is progress towards the Sustainable Development Goals. In line with the first strategic goal, poverty reduction is one of the main priorities of the new strategy. The objective of this study is to assess social protection interventions in Albania to determine the extent to which they contribute to the achievement of the first Sustainable Development Goal, which aims to reduce poverty. The methodology used in this study consists in the examination of policy and legal documents related to social protection and, in particular, to economic support, as well as in the quantitative analysis of data available in databases. The results show that social protection requires government intervention to improve the welfare of citizens and that the methodology for calculating the subsistence minimum in the Republic of Albania should be developed and approved to serve as a guide and official reference for determining economic support.

Keywords:
poverty reduction, sustainable development, SDGs, social protection, economic support

JEL:
Q01, D6, D63

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1 Introduction

No poverty is the main priority among the 17 Sustainable Development Goals (SDGs) Sustainable global development is the common goal of human society, but Covid 19 and the price crisis caused by the war in Ukraine has affected the slowdown poverty eradication process. According to the World Bank, extreme poverty will increase in 2020 for the first time in more than 20 years (World Bank, 2021).Social protection is critical to achieving the first Sustainable Development Goal (SDGs 1), which aims to end poverty in all its forms everywhere by 2030 (ILO, 2019). Over the past two decades, policymakers have recognised social protection as a key strategy to address poverty. Based on the review of the literature, there are very few studies that demonstrate the impact of social protection on the achievement of the first SDGs in Albania, and this fact served as a motive to address this issue. As the focus of this study is on poverty reduction and SDGs 1, we will exclusively concentrate on the cash assistance or 'Ndihma Ekonomike' (NE), which represents a direct measure in tackling poverty The purpose of this study is to find out whether the existing social assistance programmes aimed at poverty reduction, are consistent with the achievement of the first SDGs. NE is a cash benefit that targets needy families and individuals with special status. According to Law No. 57 (2019) on Social Assistance in the Republic of Albania, families and individuals living in extreme poverty or with insufficient income are eligible.

2 Literature Review

Over the past decade, cash transfers have gained importance in academic and practitioner circles as a preferred method of making social transfers to leave no one behind. This is because they are seen as cost-efficient, adaptable to the most urgent needs of recipients, able to maintain the dignity of recipients and are generators of multiplier effects in local markets (ICRC, 2018). A range of countries have implemented successful cash transfer programs including Brazil, Indonesia, Kenya, Mexico, Pakistan, the Philippines, South Africa and Yemen (Fiszbein & Schady, 2009; Garcia & Moore, 2012) The literature on cash transfers, and social protection in general, has highlighted that their effectiveness and sustainability relies on a well-functioning administrative system and a strong and continuing political will (Farringdon & Slater, 2006).

Many studies have attempted to evaluate whether transfers have the effect of reducing poverty or, more generally, a redistributive impact (Garfinkel, 1990; Atkinson, 2000; Heady et al., 2001; Prasad, 2008; Nolan & Marx, 2009; Caminada et al., 2010). Most of these studies focus on the effect of public transfer programs by comparing countries in terms of their social protection expenditures and measures of poverty.

In Albania, social assistance programme or Ndihma Ekonomike (NE) is designed as a temporary measure aimed at supporting individuals in need, with the ultimate objective of facilitating their social reintegration and re-entry into the labor market. NE aims to provide financial security for needy people who are unable to provide an adequate standard of living (see also Table 1).

Table 1: Social Protection Intervention (NE scheme) 1992-2021

1992-1996	Establish the legal foundations and the corresponding instances for the development of the market economy, guarantee survival.
1996-2005	decentralisation to improve the applicability of aid procedures. The average amount of NE 3,900 ALL (33 €) per month
2005-2018	The responsibilities of local government units for assessing poverty levels have been expanded, to be enriched with new elements so that – NE is targeted and directed at the poorest sections of the population. the maximum amount of NE 8,000 ALL (69.5€) per month and the average amount NE 4,100 ALL (35.6€) per month
2018-2021	Increase the electronic register at national level, increase transparency; reduce abuse and corruption; calculate the amount of benefit according to the family structure. Remain in the scheme for a maximum of 5 years

Sources: State Social Service, Annual Reports (2014, 2018, 2020, 2021).

The reform of the NE scheme has helped alleviate poverty and improve the quality of life of beneficiaries. As the cash payment of economic assistance is the only income of the beneficiary families, it is still not sufficient to cover the minimum living needs. For this reason, this reform provides a 5-year exit period for working-age persons whose families benefit from NE in order to reintegrate them into normal social life. For all persons claiming economic assistance, this strategy stipulated that they must be registered as unemployed every month. This practice seems to have produced results in the employment of working-age family members participating in the NE programme. The reform of NE scheme aims at better targeting the neediest individuals and families, as well as revising the financial measures to facilitate the livelihood of families in general. It has helped to alleviate

poverty and improve the quality of life of beneficiaries. Nevertheless, some issues remain open and unresolved, such as the calculation of the subsistence minimum, which would increase the effectiveness of economic assistance if we were to use subsistence minimum indexation to calculate its monthly amount. The historical context and challenges related to the economic transition in Albania have caused economic and social instability, leading to increased inequality. The subsistence minimum is the main social indicator used to assess poverty and to calculate economic assistance. Currently in Albania, there is no official data on the subsistence minimum indicator, which means that the basic level of poverty measurement is missing, which makes the impact of social protection, or NE, on the achievement of SDGs 1 even more challenging.

3 Methodology

The study was prepared using available quantitative data, statistics, and information from secondary sources. The secondary search for materials includes the compilation of available data and reports from various public sources published by governmental institutions such as the Annual Reports of the State Social Service for the period 2014-2021 and non-governmental from the Institute of Statistics Albania (INSTAT), Open Data Albania (ODA), and reports from international organizations such as the International Labor Organization 2021 and UNDP 2022. The Subsistence minimum in Albania is the so-called absolute poverty method adobted from (Bradshaw et al., 2000; ILO, 2012; Libanova, 2020), which involves calculating the limit of food poverty and non-food poverty. The sum of the monetary values of these two poverty lines is the subsistence minimum.

4 Results

According to the absolute poverty method, the subsistence minimum is determined in two steps: first, the cost of food is calculated, and then the cost of non-food items is calculated based on the cost of food requirements. The food basket on Table 2 is constructed based on the recommendations of ILO 2021 and UNDP 2022. It is determined which food groups are included in the model diet and the corresponding quantity for each of them. The cost of each food is determined by multiplying the quantity by the unit price based on the 2021 Household Budget Survey data,

INSTAT, and adding the cost of each product in the model diet to calculate the total cost of the basket, which is ALL 8709 (75.7 €) per month based on this data.

Table 2. Subsistence minimum per capita, 2021

Product	Monthly rate (kg)	Average unit price	Monthly Value (ALL)	Monthly Value (Euro)
Bread	3.5	123.2	431.2	**3.75**
Cereals	8	125	1000	**8.69**
Meat	0.61	715	436.15	**3.79**
Fish	0.08	819	65.52	**0.56**
Milk/by prod	3.04	395	1200.8	**10.44**
Oil	1.19	395	470.05	**4.03**
Fruit	0.56	147	82.32	**0.71**
Vegetable	21.53	187	4026.11	**35**
Sugar,sweets	1.32	687	906.84	**7.88**
Non-alcoholic drinks	0.84	108.1	90.804	**0.78**
Other foods	0		0	
Total (Food poverty line)			**8709 ALL**	**75.7**
The non-food poverty line			**10,982 ALL**	**95.49**
Subsistence minimum per capita			**19,691 ALL**	**171**

Source: INSTAT, Household Budget Survey and author's calculations

The costs that cover only the food needs calculated above cannot represent the poverty line because they ignore other important basic needs: To be healthy and participate in society, expenses for housing, clothing, and health are necessary. The table above defines the non-food costs that must be added to the food minimum to calculate the full minimum. The types of these expenses and their share of total monthly expenses are from the 2021 INSTAT Household Budget Survey. For 2021, based on the 2021 Household Budget Survey, the weight of expenditures on food is 41.3% and the weight of expenditures on non-food items considered essential to ensure a minimum standard of living is 58.7%. From the compilation of poverty lines for food and non-food items, the subsistence minimum is 19,691 ALL or 171 euros [1]Based on the data from ODA 2021, the average NE per family is 5079 lek or 44 euros. Thus, compared to the subsistence minimum calculated above, it is three times smaller.

[1] Bank of Albania, exchange rate 1 euro = 115 ALL

5 Discussion and Conclusion

Based on the results of this paper regarding the level of the subsistence minimum the payment of NE must be increased to meet the needs of individuals and families not only in the area of nutrition, but also in other areas of human development. It is recommended that the subsistence minimum be used as a benchmark for formulating social policies for those in need. The subsistence minimum should be recognised as a reference point for setting minimum urban and rural pensions, minimum wages, and financial assistance programmes for the unemployed, and NE should be improved to a subsistence minimum as an important measure to better align with the SDGs one targets. In order to have a real subsistence minimum over the years, its indexation is essential. Factors that affect the indexation of the minimum wage include inflation, remittances, or the various measures taken by the government to combat informality. By linking the subsistence minimum to various social policies, the government can ensure that its citizens are guaranteed a decent standard of living and equal access to basic social services, regardless of their income and status. First limitation of our research is lack of and difficulty in accessing the official data needed to calculate the subsistence minimum, and the second one was the difficulty to assess its effectiveness, which will only be completed after a few years.

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Empirical Evidence of the Relationship Between the SDGs and Economic Growth in Albania: The Role of Education

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Abstract Education is considered as a catalyst for change and sustainable development. While, the Sustainable Development Goals are a universal call to action to face global challenges, especially in developing economies. In this regard, the research intends to empirically investigate the relationship between selected UN SDGs and GDP per capita growth rate as a proxy for economic well-being in Albania, focusing more on the role of education, which places emphasis on the knowledge economy. This study employed the Ordinary Least Square regression model as a statistical technique where GDP per capita growth rate is taken as the dependent variable. The data for the period 2007-2020 were sourced from the World Bank, International Labour Organization, Food and Agriculture Organization and INSTAT. The results show that total government expenditure on education (% of GDP), decent employment and hunger are positively related to the GDP per capita growth. However, decent employment appears to be insignificantly related, while gender equity/women's empowerment appears to be negatively insignificantly related to the GDP per capita growth rate. The research indicates that education can promote economic and socioeconomic goals, consequently, the Albanian government should invest more in education and training.

Keywords:
SDGs, education, GDP per capita growth, empirical evidence, hunger

JEL:
H52, I25, J21

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1 Introduction

The fulfilment of the Sustainable Development Goals (SDG) is on top of the agenda of every member country of the United Nations, including Albania. The 2030 Agenda for Sustainable Development was adopted by all United Nations Member States in 2015. The 17 SDGs recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth. The agenda's 17 SDGs and their 169 targets, aim at eradicating poverty in all forms and "seek to realize the human rights of all and achieve gender equality".

In order to achieve these goals, the Albanian Government has followed the approach of integrating the SDGs targets in the national systems and instruments of the processes, such as the incorporation/integration of the 2030 Agenda global objectives in the National Integrated Planning System and the refraction and harmonization of the SDGs with the strategic framework of the country (National Strategy for Development and European Integration and sectoral and intersectoral strategies. As well, a manual has been drafted in 2021 to provide support to municipalities that are willing to prepare Voluntary Local Assessments of the SDGs.

In this context, special importance is given to the SDG4 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all' which emphasizes the importance of equality, inclusiveness and gender equality, effective learning and the practical and life value of what is learned. The objective of this study is to empirically investigate the relationship between the selected UN SDGs and GDP growth as a proxy for the economic well-being of Albania from 2007 to 2020. The research questions of this paper are:

RQ1: What is the impact of progress in selected SDGs on the economic growth in Albania?

RQ2: What is the role of education in influencing the GDP per capita growth rate in Albania?

This study employed the Ordinary Least Square (OLS) regression model as a statistical technique. Data were sourced from the World Bank, Ministry of Finance and Economy of Albania, Food and Agriculture Organization, International Labor Organization.

The rest of the paper is structured as follows. The Section 2 consists of the literature review, the Section 3 refers to the data and methodology presentation, while the Section 4 gives the empirical results. Lastly, in the Section 5 the main conclusions are summarized.

2 Literature Review

Education and training (SDG 4: educational quality and lifelong learning) also positively influences most of the UN SDGs by reducing trade-offs and maximizing their synergies (e.g., SDG 1: no poverty (Radchenko, 2019; Diwakar & Shepherd, 2022), SDG 2: no hunger (Shepherd, 2022), SDG 5: gender equality (Gebre, 2020), SDG 8: decent jobs and economic growth (Alwi et al., 2019). As a result, SDG 4 is regarded as a foundational SDG because it influences the achievement of most of the other SDGs (Lawrence et al., 2020).

Based on empirical studies, there are strong evidences of a positive relationship between education and GDP growth. Marquez-Ramos and Mourelle (2019) concluded that both secondary and tertiary education present a positive and significant relation with economic growth in the case of Spain, while government expenditure on education is not relevant for explaining economic growth in the linear specification. According to Adeniyi et al. (2021), the short-run results revealed that education quality played a significant role in enhancing inclusive growth in some of the countries of West Africa. Analyses of human capital across 14 OECD economies – based on literacy scores – also suggest significant positive effects on growth (OECD (2006), as well as Mercana and Sezer (2013) found a positive relationship between education expenses and economic growth in the Turkish economy. There are also evidences that there is no correlation between public expenditure for education and economic growth (Karaçor et. al., 2017; Villela & Paredes, 2022). While Frank (2017) revealed that in non-oil countries education expenditure increases economic growth, in developing countries education expenditure has a negative impact and in OECD countries the impact is non-

significant. Many studies have noted that gender equality in education contributes to economic growth (Morrison et al., 2007; Altuzarra et al., 2021), which is a common feature in developing countries. In addition, they found that equality in education positively contributes to economic growth, which means that higher GPI for the gross enrolment rate is an efficient economic option for all developing countries. According to Kabeer and Natali (2013), the evidence that gender equality, particularly in education and employment, contributes to economic growth is far more consistent and robust than the relationship that economic growth contributes to gender equality in terms of health, wellbeing and rights.

Empirical results reported in the paper of Arcand (2001) suggest that eliminating, or at least significantly reducing, poverty, will have an important quantitative impact on the growth rate of GDP per capita. Furthermore, according to Nafti (2021), the results of the estimates clearly show a negative relationship between economic growth rate and under nutrition prevalence; however, the economic growth of developing countries seems to be a key factor in reducing poverty and the proportion of the undernourished population.

Empirical studies highlight that economic growth tends to be positively associated with job creation. Coscieme et al. (2020) investigated the relationship between the GDP and the SDGs in European Union countries. They pointed out that in the European Union (EU), GDP growth is uncorrelated with indicators of environmental sustainability and well-being (such as employment rates) and was inversely correlated with the indicators of economic performance (such as GDP). Liu and Bi (2019) found that the better educated the labor force, the greater total capital productivity. This is because educated employees are more inclined to innovate, hence raising everybody's productivity.

3 Methodology

In this section, the data sources and the method adopted in the analysis will be explained. Data from 2007 to 2020 were collected from multiple sources to maximize the data and multiple regression was employed to explore the association between GDP growth per capita rate and selected SDGs variables.

3.1 Data and measurement

This study aims to examine the relationship between selected SDGs indicators and Albania economic growth represented by the GDP per capita growth rate. The dependent variable is the GDP per capita growth rate. The independent variables consist of quantifiable and accessible time series data related to 4 selected SDGs targets for Albania. The choice of these targets and their respective indicators is based on their significance to Albanian's NSDEI 2030. Data were sourced from the World Bank, Ministry of Finance and Economy of Albania, Food and Agriculture Organization, International Labor Organization. Table 1 shows the independent variables, their description, source, measurement, and relevant SDG.

Table 1: Variables Description and Measurement

Explanatory Variable	Variable Description	Measurement	Relevant SDG
GDP per capita growth rate **(GDPC)**	Annual GDP per capita growth rate	Annual percentage growth rate of GDP per capita based on constant local currency	8
Education **(EDU)**	Total government expenditure on education as % of GDP	Government expenditure on education, total (% of GDP)	4
Gender Equity/Female Empowerment **(GEFE)**	Gender parity index (GPI)	Gender parity index for gross enrolment ratio in tertiary education is the ratio of women to men enrolled at tertiary level in public and private schools.	5
Hunger **(HGR)**	The prevalence of undernourishment (Hunger rate as a percentage of the population)	The proportion of the population whose habitual food consumption is insufficient to provide the dietary energy levels that are required to maintain a normal active and healthy life.	2
Decent employment **(DEMP)**	Decent employment for all males and females	Employment-to-population ratio by sex and age (%)	8

Source: Author research

3.2 Empirical model and method

The following empirical model in Equation (1) will be estimated to determine which sustainable development goals variables significantly affect the GDP per capita growth rate in Albania.

$$GDPCt = \beta 0 + \beta 1\ EDUt + \beta 2\ GEFEt + \beta 3\ HGRt + \beta 4\ DEMPt + \varepsilon t \quad (1)$$

The variables are defined in the table no. 1, while εt is the error term.

This study employed the OLS regression model as a statistical technique to analyze the relationship between the selected SDGs and the GDP per capita growth rate in Albania. The model has several limitations such as: (a) small number of selected SDGs targets due to the lack of data for the period 2007-2020; (b) small number of observed time series data (14 observations) due to the lack of data before 2007 for some of the variables included in the analysis; (c) Lack of data for Western Balkan countries (WBCs) in order to see where does Albania stand in achieving the SDGs as compared to WBCs.

4 Results

This section presents the results of the multiple regression analysis of the identified UN SDG variables on Albania's GDP per capita growth as shown in the Table 2.

Table 2: Multiple Regression Results of SDG Variables on GDP per capita growth rate.

Variables	Coefficient	Standard Error	T−Statistic
Constant	-0.220	0.256	-0.857
EDU	2.549*	1.552	1.643
GEFE	-0.020	0.181	-0.108
HGR	2.078***	0.655	3.172
DEMP	0.165	0.174	0.949
R^2	0.717		
F	5.695		

Notes: The symbols *, **, and *** indicate statistical significance at the 15%, 10%, and 5% levels, respectively.

Table 2 shows that the model has satisfactory explanatory power with $R^2 = 0.717$. The education variable has the highest coefficient and reveals a positive and statistically significant relationship with the GDP per capita growth rate in Albania, which is of interest in this study. Gender equity/women's empowerment appear to be negatively insignificantly related which is not in line with literature review. This because tertiary education does not have an immediate impact as compared with literacy/primary and secondary education in lower income countries.

The relationship between hunger and the GDPC is negative which is not in line with literature review. This may be attributable to problems such as food waste, which can be addressed by educating and training the population. Decent employment is positively, but insignificantly related with GDPC.

5 Discussion and Conclusion

In this paper it was investigated the impact of selected SDGs in GDP per capita growth rate in Albania, where two research questions were raised. The focus was on the impact of education as one of the important components of opportunities and empowerment. In accordance with the examined literature, education and training plays a vital role in developing a country's human capital and boosting economic growth. It resulted a positive and statistically significant between education and GDP per capita growth rate, so 1 percentage point increase on EDU leads to 2.549 percentage point increase on the GDP per capita growth rate.

According to Singh and Alhulail (2022), in the developing economies, education is perceived as the effective way to attain gender equity through which people can enhance their economic and social welfare. In this context, Government of Albania needs to invest more on education and training in order to encourage gender equity, as it encourages women's participation in the workforce and contributes to economic activities. Furthermore, the Government of Albania should further develop multi-sectoral early childhood education policies; improve the school infrastructure; ensure full inclusion in the preparatory class and in compulsory education, where as a result access to preschool and higher secondary education could be increased.

Considering the high importance of the education, as well as the importance of achieving UN SDGs, this analysis could be further extended on investigating the impact of education on SDGs attainment not only in Albania, but as well for WBCs.

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Relationship Factors Between Supply Chain Actors

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Abstract The competition between companies is now in fact competition between value chains and supply chains. Nowadays, companies that participate in an efficiently managed supply chain based on partnerships are leading the increasingly competitive market. The companies must have recognising that the development of close strategic relationships and network cooperation between chain members is an essential part of market competition. The problem is that few company realise this yet. In the framework of the Budapest Business School Supply Chain and Value Chain Research Group, we are trying to explore the supply chain and logistics practices of Hungarian companies and institutions. Our research aims to identify the most important factors for successful business relationships. Our results show that long-term strategie business connections lead to success. Based on our research, we can say, a business point of view, trust, communication and cooperation become competitive factors.

Keywords:
supply chain, relationship, trust, long-term cooperation, network

JEL:
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1 Introduction

In the current globalised and increasingly networked world economy, a whole new social and economic challenges for the businesses that drive the economy. Confronted with a rapidly changing environment, companies must seek ways to survive, grow and compete (Michna, et al., 2020). All this is supported by well-functioning inter-business relationships. In the supply chain, companies need to be both upstream and downstream focused, collaborating with their chain members (Pulcini et al., 2018). Many companies are able to prosper through effective coordination first of all, and collaboration with supply chain partners (Yang et al., 2008; Surachman et al., 2019). Collaborations between supply chain partners provide members with the benefits and competitive advantages of the relationship, thereby enhancing the performance of supply chain partners (Shin et al., 2019). The aim of our research is to understand the corporate value chains and the supply chain link networks chains, and to see to what extent partnership and the techniques based on it are present in domestic corporate practice principles formulated in the research. The practical application of the principles developed in the research can contribute to the adaptation of companies to international trends to international markets, and to the maintenance of competitiveness.

2 Literature Review

The aim of supply chain management is to increase competitiveness and improve cooperation between partners (Hattayer & Gál, 2022). The relationship between partners facilitates the delivery of the best products and services to the market and the efficient and effective creation of value for the end user of the supply chain (Oluyomi et al., 2021). The supply chain is a cross-company series of value-creating processes that can create products and services suitable for satisfying customer needs, the characteristics of which include cooperation, a strategic approach and customer focus (Kozma et al., 2021). Efforts should be made to develop effective partner relationships with suppliers and buyers (Kumar et al., 2017). Nowadays, companies that participate in an efficiently managed supply chain based on partnerships are leading the increasingly competitive market (Szegedi et al., 2019). More and more companies are recognising that the development of close strategic relationships and network cooperation between chain members is an essential part of market competition (Wheelen et al., 2017). Trust is very important for strategic

cooperation (Haakansson, 2009; Mandják et al., 2010). Without trust none of the partners will take the risk of committing to the relationship (Barroso et al., 2016). Trust also has a positive impact on collaboration between supply chain members and positively affects company performance (Dubey et al., 2017; 2018; Uca et al., 2017) Research by Cullen et al.'s (2000) and Nyaga et al.'s (2010), also report on the positive impact of trust on firm performance and commitment to the partner relationship.

The economic environment has a significant impact on supply chains, where uncertainty and unpredictability are a threat. In the event of demand uncertainty, which is currently a characteristic of the markets, supply chain partners may face overproduction or stock shortages. It is difficult in this situation to predict what is likely to happen. In order to improve this situation, supply chain partners tend to integrate with suppliers and buyers, and a good long-term information sharing between the two parties can help to obtain more useful information that will help them to make the right decisions (Yeh et al., 2020). In an uncertain economic environment, close and long-term cooperation between chain members is of paramount importance and can lead to success. The longer the duration of a relationship and the more flexible it is, the closer the degree of cooperation will be. Resilience is an important element of relationships (Zomorrodi & Sajad, 2010). Resilience is important in the relationship with its supply chain partners (Stevenson & Spring, 2007).

3 Methodology

The subjects of the research are mainly businesses operating in Hungary. The following criteria are taken into account when selecting a company: 1. the selected company must be based in Hungary (in the case of a subsidiary, the parent company the parent company may be foreign) 2. have at least 5 years of operation. The research is primarily based on primary research, using a questionnaire survey and structured in-depth interviews to investigate the role and activities of domestic enterprises in the supply chain. Data was collected using the snowball method. Our survey was conducted in the 2021/2022 scool year period. In the course of the research, we aim to achieve representativeness in the classical sense, but not as a goal, because we are trying to find correlations and explain causal relationships. The data will be analysed and simple and deeper statistical correlations will be explored,

using the SPSS mathematical-statistical software package software package. The demographic profile of the sample is presented in Table 1.

Table 1: The demographic profile of the sample (N = 329)

Variables	Sample	Number of samples	%
company size by employees	micro-enterprise	78	23.7
	small business	110	33.4
	medium enterprise	72	21.9
the place of the company in the supply chain	supplier	34	10.3
	manufacturer	131	39.8
	wholesaler	72	21.9
	retailer	92	28

The population includes small, medium and large companies operating in Hungary, in terms of proportions, micro-enterprise 23.7%, small business 33.4 %, medium enterprise 21.9%. The proportion of manufacturers in the sample was close to 40%. Suppliers accounted for the smallest share, 10.3 %. The share of retailers was 28% and the wholesaler accounted for 21.9%.

4 Results

The starting point for the analysis of business relationships between companies and their partners was to ask which factors are strategically important to the members of the chain in terms of their business relationships. The results are illustrated in the following figure (Figure 1).

The results of the Fiedman test ($p<0.001$) (Figure 1) show that there is a significant difference in the factors that are considered important in the business relationship between the company and its partners. The average ranks show that long-term sales relationships (9.34) and long-term supplier relationship (9.32) are the most important in business terms. Strategic alliance with suppliers (8.51) and customers (8) ranks second.

We looked at whether we found significant differences between the views of suppliers, manufacturers, wholesalers and retailers on what they consider important in their business relationships (Table 2).

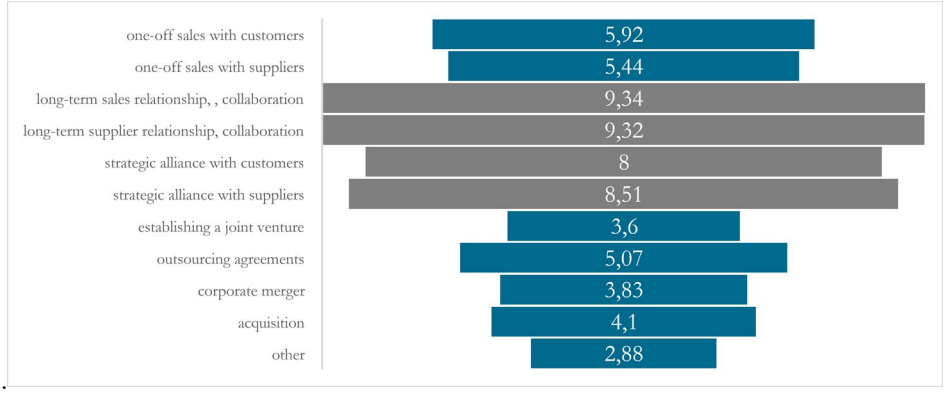

Figure 1: Key factors in business relationships
Source: Authors' research.
Note: Friedman Test: Chi2=2028.655; p=<0.001

Table 2: Partnership factors

	One-off sales with customers	Long-term sales relationship	Strategic alliance with customers	Strategic alliance with suppliers	Outsourcing
Kruskal-Wallis H	21.957	8.805	12.733	8.716	8.025
df	3	3	3	3	3
Asymp. Sig.	**0.000***	**0.032***	**0.005***	**0.033***	**0.045***

*p < 0,05
Source: Authors' research.

There is a significant difference of opinion between the different groups on the following: One-off sales with customers, Long-term sales relationship, Strategic alliance with customers, Strategic alliance with suppliers, Outsourcing.

Kendall's rank order correlation was we used the rank the success factors of the companies' business relationships. The result of the test is highly significant, *p<0.001. (W=0.459) agreement is found (Table 3).

Table 3: Success factors of business relationships

Kendall's			Relationship success factors	Mean Rank
N	329		An open, committed relationship	7.33
Kendall's W[a]	0.459		**Smooth cooperation, fast, flexible response**	8.63
Chi-Square	1660		Interdependence	4.31
df	11		Winner-winner, mutually beneficial relationship	7.45
Asymp. Sig.	0.000*		**Trust**	8.65
			Activity sharing	4.01
			The agreement provides a framework for cooperation	6.76
			Information sharing	6.81
			Quality of communication	8.26
			Joint problem solving	7.28
			Meeting their own strategic objectives	6.93
			Other	1.6

Source: Author's research.

The most important success factors are trust (8.65), smooth cooperation, fast, flexible response (8.63) and quality of communication (8.26).

Redondo and Fierro's research has shown that trust is stronger and plays a bigger role in micro enterprises than in small and medium enterprises. (Redondo & Fierro, 2007) We sought to answer the question of whether there is a difference between the perceptions of different sizes of companies on the importance of trust as a relationship success factor.

Table 4: The role of trust in certain corporate groups

group	N	Mean Rank	Kruskal-Wallis H	Asymp. Sig.
micro-enterprise	78	177.64	6.203	0.102*
small business	110	152.40		
medium enterprise	72	173.73		
large company	69	161.68		

*p=0.102 >0.05 agreement is not found

Source: Author's research.

In terms of ranks, micro enterprises show the highest scores (177.64), but no significant difference was found between the different groups of enterprises.

In addition to the success factors, we examined the failure factors and looked for correlations.

Table 5: Factors of partnership failures

Kendall's			Relationship failure factors	Mean Rank
N	329		**Lack of commitment from the partner**	6.25
Kendall's Wa	0.260		Lack of their own commitment	5.40
Chi-Square	769.4		Lack of compliance with strategic objectives	5.74
df	9		**Lack of smooth cooperation**	6.15
Asymp. Sig.	0.000*		Winner-loser attitude in the relationship. excessive subordination	5.74
			Lack of trust	6.23
			Lack of activity sharing	4.48
			Poor information sharing, inadequate communication	6.89
			Lack of joint problem solving	5.91
			Other	2.2

*p<0.001, the result is highly significant. (W=0.260)

Source: Authors' research

A parallel can be drawn between the success and failure factors. Factors of partnership failures: lack of commitment from the partner (6.24), lack of smooth cooperation (6.15), poor information sharing (6.89), lack of trust (6.23).

5 Discussion and Conclusion

The added value of the supply chain is generated by the efficient functioning of the supply chain (Kozma & Tóth, 2017). The main objective of this study was to investigate What types of relationships (one-off sales, long-term collaboration, strategic alliances, etc.) are of high strategic importance in the life of a company in relation to its business partners? What are the factors behind the success or failure of a company's business partner relationships? What role does trust play? Long-term collaboration with both customers and suppliers stands out as one of the most important factors in supply chain relationships. The suppliers, manufacturers and wholesalers they emphasise long-term cooperation most. We found that trust is a success factor in business relationships. If there is no trust between partners, it will lead to the failure of the business. Cooperation between chain members is important for the efficiency of supply chains. Communication and its quality can move the success of a business in a positive or negative direction. In conclusion, companies

need to recognise the importance of building and maintaining good business relationships. It is important to formulate that it is impossible to operate alone in a market without relationships. Companies need to take a long-term view of their partnerships and then they will be able to succeed. Trust is important as a foundation stone. It is worth developing communication skills to work more effectively. It is advisable to work with business partners who have a similar mentality. Companies can learn from each other in these processes. Companies have individual corporate cultures, it is not possible to generalise, but our study can give a good starting point. By expanding the sample, we can address the limitations of the study by including more firms of different sizes, cultures and ownership.

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Assessment of Organizational Aspects Affecting Knowledge Management in Auditing and Consulting Firms

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Abstract Globalization, rapid information technology development, and COVID-19 restrictions created challenges for organizations globally to use knowledge management practices to identify proper strategies and find solutions to satisfy changeable customer needs and develop uniqueness leading to leadership and mutual value creation. Knowledge management is an effective and efficient organization's management direction and practice that became necessary to improve organizational performance in a dynamic environment. Prior research showed that various organizational factors have different plaid roles in the knowledge management cycle and influence knowledge management processes differently. The main goal of this study is to explore the influence of specific organizational factors, flexible organizational culture and balanced organizational structure on the efficient implementation of five knowledge management processes, including knowledge application, creation, acquisition, sharing, and storage. The research was conducted in the unstudied context of Mideast countries and the knowledge-intensive auditing and consulting firms' sector. Following the scientific literature analysis, the research model was developed, and the research hypotheses were proposed and then quantitatively tested through the structural equation modeling (SEM) technique. This study's results supported the hypotheses that the identified organizational factors were significantly associated with the knowledge management cycle.

Keywords: knowledge management, knowledge management processes, organizational culture, organizational structure, auditing and consulting firms

JEL: M10, M14, M42

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1 Introduction

Knowledge management is one of the essential directions corporate leaders address (Pandey et al., 2018), recognizing the crucial role of employees' commitment in maintaining their continuation and professional development (Fernandes, 2018). Committed employees show higher motivation and job satisfaction, increasing corporate strategy achievement and leading to sustainable organizational performance, better productivity, or process efficiency (Schmitt, 2021).

Previous scientific studies outlined the leading role of organizational factors in shaping an effective and efficient knowledge cycle, including the significance of organizational culture and organizational structure (Low et al., 2020). However, these factors differently affect employees' motivation and implementation of knowledge management strategies through processes until sustainable organizational outcomes. The reluctance of organizations in the Mideast, especially in developing countries, to use knowledge management practices to maintain employee commitment is due to several factors, including a lack of technological infrastructure and expensive collaborations caused by geopolitical conflicts, social and economic barriers (Kassab, 2016). However, knowledge management has recently been introduced as a potential way for Mideastern countries to shift into knowledge-based economies and sustainable outcomes (Alayoubi et al., 2020). To effectively implement knowledge management, companies need to build corporate strategies that integrate knowledge strategies and support sustainable organizational performance and innovation. However, limited research exists on the effective appliance of organizational factors in this context.

This study focuses on auditing and consulting firms in the Mideast region, aiming to explore the influence of a flexible organizational culture and a balanced organizational structure on the efficient implementation of the five processes of knowledge management in these firms. The research hypotheses were tested using the structural equation modeling (SEM) technique in an empirical study.

2 Theoretical Background

2.1 Organizational culture and knowledge management

Organizational culture refers to the shared values, norms, and beliefs that guide the behavior of members within an organization toward achieving desired outcomes (Fernandes, 2018). The vision of an organization's leaders shapes the corporate culture, which is unique to each organization and reflects its identity, history, and experiences (Low et al., 2020). Previous research has identified various dimensions of organizational culture, including flexibility, creativity, efficacy, risk-taking, an external focus, and an internal core that supports efficient business operations and integration (Soltani et al., 2019). The organizational culture influences the social interaction pattern within the organization, affecting how individuals communicate and exchange knowledge, which can lead to new corporate knowledge creation and distribution (Fernandes, 2018). Scientists verified that organizational culture could advocate the knowledge-sharing process in Indonesian healthcare organizations (Sensuse et al., 2014), positively affected knowledge donating and collecting (Cavaliere & Lombardi, 2015), knowledge creation, storage, transfer, and application in the IT companies in Taiwan (Chang & Lin, 2015), knowledge transfer in Chinese construction firms (Wei & Miraglia, 2017) and the Foreign Direct Investment enterprises in Vietnam (Pham & Dinh, 2020), knowledge sharing in Ecuador's food and beverage sector (Chión & Charles, 2020) or knowledge sharing in private universities in Singapore (Ng, 2022). However, all these studies did not explore organizational culture's influence on the knowledge management cycle in the knowledge-intensive sector. To test the effect of organizational culture on the knowledge management cycle in the Mideast auditing and consulting firms, the following hypotheses were proposed (Figure 1):

H1a: A flexible organizational culture influences the knowledge application process positively;
H1b: A flexible organizational culture influences the knowledge creation process positively;
H1c: A flexible organizational culture influences the knowledge acquisition process positively;
H1d: A flexible organizational culture influences the knowledge sharing process positively;
H1e: A flexible organizational culture influences the knowledge storage process positively.

2.2 Organizational structure and knowledge management

The way an organization is structured determines how tasks are distributed among different units, how responsibilities and authorities are divided among individuals, and how activities flow within the organization (Chión & Charles, 2020). The organizational structure should align with the organization's strategy to achieve sustainable performance. It is based on the design of different units, reporting processes between departments, and coordination of various divisions (Acharya & Mishra, 2017). The structure can be physical, such as size and hierarchy, or non-physical, such as centralization, specialization, and formalization, and affects members' behavior and performance (Akbar et al., 2019). A balanced and flexible organizational structure can increase the efficiency and effectiveness of activities and promote knowledge management practices, such as knowledge sharing, by maintaining social interaction and communication channels between employees (Acharya & Mishra, 2017). The organizational structure impacts the flow of knowledge and the efficiency of business processes by determining the hierarchy and division of work within departments. Previous several studies highlighted organizational structure's positive impact on the knowledge circulation process in Taiwan-based enterprises (Ho et al., 2014), knowledge retention in the Indian infrastructure consulting sector (Acharya & Mishra, 2017), and knowledge sharing in Ecuador's food and beverage sector (Chión & Charles, 2020). In order to test the effect of organizational structure on the knowledge management cycle in the Mideast auditing and consulting firms, the following hypotheses were proposed (Figure 1):

H2a: A balanced organizational structure influences the knowledge application process positively;
H2b: A balanced organizational structure influences the knowledge creation process positively;
H2c: A balanced organizational structure influences the knowledge acquisition process positively;
H2d: A balanced organizational structure influences the knowledge sharing process positively;
H2e: A balanced organizational structure influences the knowledge storage process positively.

The following research model was created based on previous studies' limitations on organizational factors affecting the overall knowledge management cycle in the knowledge-intensive sector of auditing and consulting in the developing economies Mideast area (Figure 1).

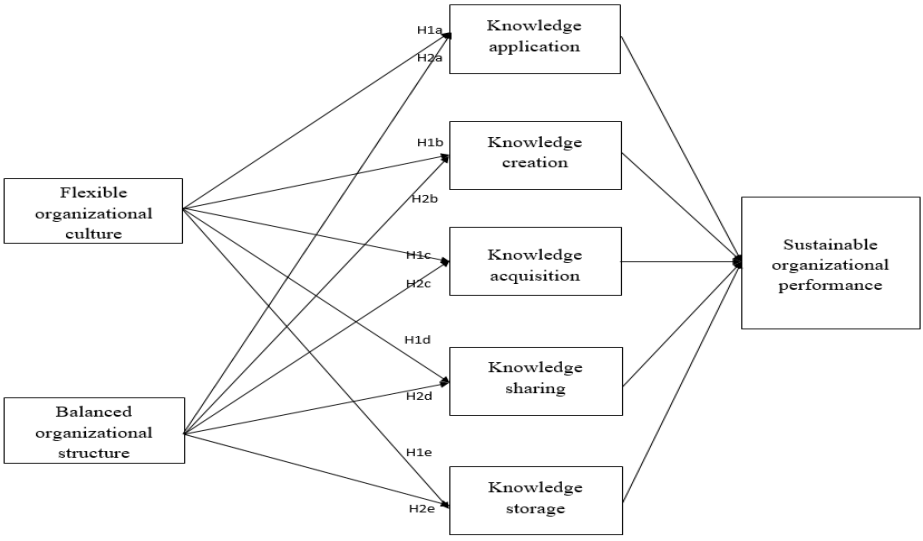

Figure 1: Research model

Source: own.

3 Methodology

An empirical study was conducted to analyze the relationship of a flexible organizational culture and a balanced organizational structure with the five knowledge management processes (application, creation, acquisition, sharing, and storage). To collect the data for testing the research hypotheses, a structured questionnaire was distributed among the certified public accountants, members of the auditors' association in Lebanon, Syria, and Jordan who became licensed experts after fulfilling the requirements of their associations' domestic auditing and consulting firms or work in international firms located in the region.

The sample size involved 374 experts, 72.46% males and 27.54% females; 45.72% aged between 25 and 35 years, 28.61% aged above 45 years, 21.12% aged between 35 and 45 years, and 4.55% aged below 25 years; 38.77% master holders, 31.28% CPAs, 29.68% bachelor holders, and 0.27% other degrees; 30.48% in upper management positions, 26.47% in senior level, 21.93% in the middle level, and 21.12% in junior level; 73.00% operating in domestic and 27.00% in international firms.

4 Results and Discussion

The reliability of the variables was tested through Cronbach's Alpha, resulting in significant coefficients greater than the threshold of 0.7 (Table 1).

Table 1: Cronbach's Alpha Coefficient

Variable	Cronbach's alpha
Knowledge application	0.858
Knowledge creation	0.833
Knowledge acquisition	0.890
Knowledge sharing	0.869
Knowledge storage	0.757
Flexible organizational culture	0.965
Balanced organizational structure	0.963

SEM technique was employed through the SPSS software to test the research hypotheses, analyze the relationships among the identified variables, and quantitatively test the theoretically hypothesized research model (Table 2).

Table 2: Structural equation modeling with the proposed research hypotheses

Research hypotheses	Standardized coefficient	t-value	p-value	Empirical evidence
Flexible organizational culture				
H1a	0.127	3.44	0.001	Supported
H1b	0.295	8.62	0.026	Supported
H1c	0.399	9.63	0.016	Supported
H1d	0.396	12.15	<0.001	Supported
H1e	0.174	5.26	0.049	Supported
Balanced organizational structure				
H2a	0.377	13.89	0.005	Supported
H2b	0.381	15.18	0.009	Supported
H2c	0.448	14.76	0.025	Supported
H2d	0.458	17.72	<0.001	Supported
H2e	0.382	15.26	<0.001	Supported

A flexible organizational culture had a significant positive association with knowledge application, creation, acquisition, sharing, and storage, with p-values below 0.05. Therefore, H1a, H1b, H1c, H1d, and H1e were supported. The results demonstrated that human resource practices and leaders' tendency to encourage employees to participate in the knowledge management cycle would lead to fruitful

results in implementing the knowledge management processes in the Mideast audit and consulting firms.

A balanced organizational structure had a significant positive association with knowledge application, creation, acquisition, sharing, and storage, with p-values below 0.05. As a result, H2a, H2b, H2c, H2d, and H2e were supported. The results demonstrated that an organizational structure allowed an efficient flow of knowledge across the boundaries of the audit and consulting firms contributing to the efficient implementation of the knowledge management cycle.

The study results indicated that a flexible organizational culture and a balanced organizational structure in Mideast's auditing and consulting firms positively impacted the efficient implementation of knowledge application, creation, acquisition, sharing, and storage. Based on the experts' evaluation conducted using the survey method, the operations of the auditing and consulting companies depend mostly on the knowledge acquired from legal authorities rather than the new knowledge being generated. These companies were mostly tailored to specific projects and, thus, were not systematized.

Unlike previous studies focusing on knowledge sharing as a specific knowledge management process, this study focused on the overall knowledge management cycle and analyzed two main organizational factors. This study has practical implications for how organizations can enhance employees' engagement in the knowledge processes by supporting best practices that lead to new developments, facilitating interdepartmental collaboration, and promoting knowledge sharing across departmental boundaries, leading to sustainable organizational performance.

5 Conclusion

Implementing knowledge management has been demonstrated to be a useful way to achieve goals and improve sustainable organizational performance. This study examined the impact of organizational factors such as a flexible organizational culture and a balanced organizational structure on employees' ability to participate in knowledge management. An empirical study was conducted on Mideastern auditing and consulting firms, using a structured survey to collect data and the SEM technique to analyze it. The study recommends that organizations operating in

knowledge-intensive sectors should integrate the organizational factors supporting knowledge management to improve sustainable organizational performance. However, the research had limitations as the study focused on a specific context, which could impact the findings' generalizability. Additionally, the data collection method was limited to a structured questionnaire, creating opportunities to test the model in other geographical areas impacting knowledge management practices.

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PUBLIC URBAN GREEN SPACES: COMBINING GOALS FOR SUSTAINABILITY, URBAN HEALTH AND WELL-BEING

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Abstract Urban green public spaces offer healthy and environmentally friendly solutions to the effects of rapid, unsustainable urbanization on health and well-being. Public green spaces available for walking, running, cycling, scootering, walking, informal play and other outdoor activities can improve the safe mobility and access to basic ecosystem, improving the health equity. Understanding the relationship between public urban green space characteristic and sustainability components can help the planning of these spaces. Nowadays, quantifying the impact of green spaces on health is receiving more and more attention in various interdisciplinary research activities. In this paper, we analysed the impact of proximity to urban green areas on health and well-being of the people in two Hungarian cities Debrecen and Szeged. In the first, descriptive phase of our research, we examined the amount of green space in two cities of the same relative status, the satisfaction of their inhabitants with green space and life expectancy. One of the targets of SDG 11 is to provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities. Our research focuses on SDG 11.

Keywords:
green and public spaces, SDGs, recreation, health, sustainability

JEL:
Q57, R11, R58

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1 Introduction

In connection with climate change and with the strengthening of the urbanization trend, the role of green areas in settlements is increasingly important. Several types of economic benefits associated with urban green spaces are identified by Zhao and Chen (2018). It has been verified that the production of urban green spaces (UGS) has gradually become a profitable method of investment in macroeconomic capital flows and accumulation. Despite this, nowadays, the area and population density of cities are increasing, with the continuous growth of the built-in and the paved areas. Urban green spaces get a marginal role, their appearance is fragmented and they are distributed unevenly. Increase in urbanization and in the density of cities have growing health risk for the inhabitants. Several studies publish data about the health effects and benefits of time spent in nature. The thought that green spaces have beneficial effect on the health of inhabitants has been accepted as a general principle since as early as the 1800's: e.g. London organizations such as the commons preservation society and the national health society urged the preservation and accessibility of open green spaces, and they mentioned the squares and parks within the crowded inhabited areas as 'the lung of the city' (Hickman, 2013). According to the definition of the most recent healthy cities initiative of the who, "a healthy city is one that continually creates and improves its physical and social environments and expands the community resources that enable people to mutually support each other in performing all the functions of life and developing to their maximum potential" (World Health Organisation, 2016a). The amount and distribution of green space has not only environmental but also social impacts (Sax et al., 2022). In the previous decades, significant number of studies reported the positive effects of green space exposure on human health and well-being, with a special view to the correlation between the accessibility of the green spaces in the inhabited areas and the better health condition (Nielsen & Hansen, 2007; Van den Berg et al., 2010). Ecological degradation leads to environmental health and public health issues, therefore, the restoration of these affected areas supports the health of the environment and the inhabitants as well. More intense ecological degradation can be observed in the peri-urban and the rural areas due to various industries, therefore, the health condition of the inhabitants in this region is often worse (Marsch et al., 2003). Human health includes well-being and subsistence as well, which are determined by various social, cultural, economic and environmental factors. It is a demonstrated fact that ecological restoration and the restorations in various sample areas significantly

contribute to human health. In the practice of environmental management and during ecological restoration it is important to clarify and understand how the given restoration effort and process is related to human well-being and how it supports it (Bradby et al., 2021). Thus, the purpose is to redirect settlements into ecosystem and to create more livable and sustainable cities to provide an efficient response to environmental challenges because of the integrated and interdisciplinary development of the UGS. The increase in the population of cities, the ratio of the area of the available green spaces and the modern lifestyle in the 21st century result in lower and lower contact of people with nature. In our study, the beneficial effects of access to nature on health and general well-being are assessed in two Hungarian cities, Debrecen and Szeged, both cities are among the largest regional centers in Hungary. The study of minor cities, considered as potential growth poles, is a highly relevant issue in Hungary's unicentral spatial structure. The economic performance and relative economic position of Debrecen and Szeged are very similar (Molnár et al., 2018), both being major knowledge centers. Other research also confirms in terms of the well-being of city dwellers, it is not enough to look at GDP per capita, but all the other softer factors (e.g. UGS) must also be considered to ensure that the municipality projects the image of a livable city, to retain its population and to attract new ones (Michalkó, 2015).

2 Theoretical Background

Until 2050, the two-thirds of people - almost 6.5 billion people - will live in cities, predictions say. High-rate urbanization is accompanied with the decrease of UGS and related to the deterioration of quality of life (Dewan & Yamaguchi, 2009). In the level of cities, sustainable development cannot be ensured without rethinking and redesigning the urban environment that provides long-term benefits and opportunities. UGS play a distinguished role in the sustainable development of cities. Green space interventions nurture the existing character of the city, improve environmental conditions, promote outdoor recreation places and active lifestyle, and they protect biodiversity by establishing a habitat for wild animals. They also highly decrease heat island effect and surface run-off. Recently, the role of these interventions in the decrease of carbon-dioxide emission and the improvement of the health of citizens appeared in literature and practical life as well (Haq, 2011). By 2030, it is a priority goal to be able to provide universal access to safe, inclusive and accessible green and public spaces, especially for women, children, the elderly and

the disabled (Goal 11). The development and support of economic, social and environmental relations can ensure sustainability between the urban, peri-urban and rural areas. In the previous decades, the design of cities was characterized mainly by the establishments of building, contiguous housing estates and new city parts, therefore, insufficient attention was paid to green spaces, which affected social and societal sustainability relations. In the previous decades, the design of cities was characterized by the construction of buildings paying little attention to green spaces, which affected the social sustainability of urban areas (Teimouri, 2019). Green spaces play a key role in the support or urban ecological, social and societal systems (Barbosa et al., 2007). UGS are important for human well-being, contribute to quality of life and promote social interaction and inclusion (Pinto et al., 2022). Healthy people, the environment and the healthy people - environment interactions create synergetic relationships which influence the sustainability of cities (Liu et al., 2007). According to a WHO report "there is no universally accepted definition of UGS. Generally, green spaces in urban areas are public parks; other definitions may also include private gardens, woodlands, children's play areas, non-amenity areas (such as roadside verges), riverside footpaths, beaches, and so on" (World Health Organization, 2016; Teimouri,2019). There is a difference between UGS and open areas: open areas are urban areas currently not subject to development/construction, and they are freely accessible for inhabitants. Open areas include green areas covered by vegetation, kindergarten or school yards, vacant lots, public amenities - seating areas, playgrounds and the community green spaces of living estates (Teimouri, 2019). UGS can be interpreted as an urban area covered by natural or non-natural vegetation, and by its use, it has social and ecological significance (Bahram, 2008).

3 Methodology

Our research question is to investigate whether there is likely to be a positive relationship between health, satisfaction and the amount of green space. In two selected cities (Debrecen and Szeged, Hungary) 1000-1000, i.e. altogether 2000 people were asked via phone. Their responses were immediately recorded online. Data collection required 3 months. The sample size was 1000 for both cities. In this case, the margin of error was +/- 3.1 percent in case of 95 percent probability. By considering the whole sample of 2000 people, the margin of error was +/- 2.2 percent in case of 95 percent probability. These margins of error are valid for a result of 50 percent. In case of an incremental sample and lower percentage ratio, margin

of error can be lower. The sample is representative for the inhabitants of Szeged and Debrecen based on sex and age. During the research, people aged 15 or more were interviewed. The questionnaire had 16 questions: sex and age of the respondent; purpose and frequency of visitation green spaces (parks); satisfaction with the number of green spaces in the city; satisfaction with the area of green spaces in the city; tidiness/cleanliness of green spaces; way of travel to a green space; time of getting to a green space on foot; time spent in green space; number of green spaces used by the respondent in the city; characteristics of the preferred green spaces; infrastructural aspects of the selection of the green space; satisfaction with the infrastructure of green spaces; type of the real estate the respondent lives in. The questionnaire survey was carried out with the involvement of the staff of the Partiszkon Social Research Nonprofit Organization, and the research was subsidized by the Ecopolis Foundation. In the questionnaire survey, quantitative and qualitative data were collected, and it asked questions about the habits, ways and frequencies of green space use in a broad range. Due to the exploratory nature of the research, we used the relationships and trends revealed based on the questionnaire responses during the analysis. First the sociodemographic and other background variables, and the basic distribution was assessed for each question. Afterwards, the responses to the questions were compared to the background variables. In the first phase of our research, we publish a descriptive statistical analysis of the questionnaire. During the analysis, mostly the differences between the cities were focused on. The results obtained were compared with the databases of the KSH (Central Statistical Office of Hungary), which includes the area of the cities (KSH, 2019) and the area of the green spaces managed by the local governments (KSH, 2021). We have also compared life expectancy at birth based on the KSH (2022) census database (this dataset is available at the county level).

4 Results

In terms of demography and background variables it can be stated that the ratio of sexes in the full sample (N = 2000) is balanced, practically 50-50, however, women are slightly overrepresented (52.4%). Broken down by cities, the ratios more or less accurately depict the real distributions, showing a slight majority of women in case of both settlements, similar to the national data. The age groups of the inhabitants of the two cities have a similar distribution in the sample. In Szeged, the ratio of people living in a flat with a balcony or a common yard is about twice as high as

people living in flats without a balcony or a common yard. In Debrecen, however, this ratio is highly shifted towards people living in a house who make up more than half of the city's population, far ahead of people living in flats with free space, which make up a third of the inhabitants. One in three people visits parks at least once a week for recreation. The inhabitants of Debrecen visit green spaces more frequently to rest, read or just sit there than those of Szeged. In case of park visitation to meet friends or to spend time together with the family, the Szeged respondents show higher ratio for higher frequency categories, while the Debrecen respondents had higher ratio for the lower frequency categories. Based on this it can be stated that people in Szeged select green spaces to nurture family and friend relationships more often than people in Debrecen. In terms of the frequency of green space visitation purpose, the motivation behind park visitations were aligned, the responses were simplified, and the alternatives showing any non-zero visitation frequency were contracted. In this way, a dichotomous variable was determined, which shows whether people visit parks for a given purpose or they do not visit parks, however, it does not analyze the frequency of visitation of the green space. The individual relaxation is the most popular purpose of visitation, followed by the spending of time with friends, family, children and grandchildren. The ratio of satisfaction with the number of green spaces was 36.4% in Szeged and 23.4% in Debrecen. One third of the Szeged inhabitants and one fourth of the Debrecen ones were fully satisfied with the area of green spaces in their cities. People living in a house with own yard are more satisfied with the cleanliness of green spaces than the inhabitants of flats. Distribution of the accessibility of the visited green space on foot in the whole sample: 61.3% within 10 minutes or less, 15.4% within 15 minutes and 23.3% over 15 minutes. Distribution of the means of travel to the green space in the full sample: 78.6% on foot, 25.9% by bike, 15.5% by public transport and 21% by car. As regards the time spent in green spaces, the ratio of respondents spending less than an hour (44.8%) or 1-2 hours (44%) is practically identical. The visitation time for people over 65 is typically lower, while people under 20 typically spend more time in green spaces. The primary purpose of using several green spaces is the demand for variability; this was mentioned by almost three-fourth of the respondents. The reasons 'different functions' or 'similarly accessible multiple parks' were mentioned similar times, by every fourth respondent. The reason 'same function but different equipment' was mentioned only by the eighth of the respondents. As regards the low distance from home, there is a significant difference between the inhabitants of the two cities. For Debrecen respondents, the lower distance from the green space

is more important than for the Szeged respondents. Based on the Public Administration Name Book of the Central Statistical Office of Hungary (2019), the area of Debrecen was 46166 ha and that of Szeged was 28099 ha. Based on the 2021 database of the Central Statistical Office of Hungary, the area of green spaces owned by the local government of Debrecen is 177 ha, out of which 162 ha is public park; in Szeged, the area of green spaces owned by the local government is 338 ha, out of which 312 ha is public park (KSH, 2021). This means that the area of green spaces compared to the whole area of the city is 0.4% in Debrecen and 1.2% in Szeged. The green space for a single inhabitant is 9 m2 in Debrecen and 21 m2 in Szeged. The health status of the population can be inferred from the fact that the average life expectancy at birth is higher in Szeged than in Debrecen, both for men and women (KSH, 2022).

5 Discussion and Conclusion

In our research, the effect of the vicinity of UGS on human health and well-being in two Hungarian cities, Debrecen and Szeged was analyzed. The results of the first phase of the survey were in accordance with expectations, with Szeged's characteristics being clearly more favorable. In the current phase of the research, no causality can be confirmed. One of the purposes of the SDG 11 is to provide universal access to safe, inclusive and accessible green and public spaces, especially for women, children, the elderly and the disabled. The different satisfaction of the inhabitants of the two cities can be explained by that the area of green spaces in Szeged is double in absolute terms, two and a half times in terms of population, and three times in terms of area compared to Debrecen. This result is in line with the results of an earlier survey, according to which the population of Szeged is satisfied with the state of the natural environment, while the people of Debrecen are among the most dissatisfied (Berki & Halász, 2015). Based on the findings it can be stated that the quantification of the effect of green spaces on physical and mental health must receive higher and higher attention in the various interdisciplinary research activities. The question of sustainability may be incorporated into city design practice by the characteristics and the indicators of the urban green spaces serving public purposes.

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ESG Scores and Firm`s Performance in Eastern and Southern Europe

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Abstract Sophisticated investment seems to no longer happen without considering a firm's ESG scores, ranking, or sustainable initiatives, but is this narrative of companies having a positive impact on society consistent with delivering alpha, does it translate into better firm performance? Established markets around the world benefit from numerous studies into the ESG impact on firm performance - the aim of this paper is targeted at investigating the effect of ESG scoring on a firm's performance in emerging capital markets in Eastern and Southern Europe. I conducted research from a sample of companies reporting on ESG from developing markets, with financial performance measured through ROA, ROE, Debt-to-Equity Ratio, and P/E, with panel data from 2018-2022, using STATA to run a multivariate regression to test for correlations. The results show that there is a positive statistical relationship between ESG and firm performance, but financially meaningful ESG integration in emerging markets requires more than the generalist approach to ESG issues.

Keywords:
ESG, emerging markets, Eastern and Southern Europe, firm performance, sustainability impact

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1 Introduction

The origin of the ESG term can be traced back to the early 2000s, with the term first coined in the landmark *Who Cares Wins* report, a collaborative initiative by 23 global leading financial institutions at the invitation of the United Nations, which highlighted the importance of sustainable business practices, thus becoming the catalyst for the emergence of ESG investing (United Nations, 2004; Gillan, 2021).

Sustainable investment, or sustainable responsible investing (SRI), simply means investing without causing harm to society, and has its roots in ancient times when religious laws guided people's actions, urging them to avoid damaging and illegitimate activities (Tripathi, 2020). In pre-modern times, the Quakers movement shifted towards responsible investing by avoiding investments in armament or tobacco companies (Tripathi). ESG investing later transitioned from negative to positive screening, which involved identifying companies that have a positive impact on society and the environment (Tian, 2021; Cappucci, 2018; Landi, 2019).

ESG investing considers these factors in addition to conventional financial analysis to identify investments that align with investors' values and long-term sustainability goals, and to fund companies that are working towards a more sustainable future.

In emerging and frontier markets however, investors are not as focused on sustainability and ESG factors, in part due to operational difficulties stemming from a lack of regulatory oversight and disproportionate governance (Odell, 2016), as well as a focus on more traditional investment strategy.

Numerous studies have examined the relationship between ESG and firm performance in established markets around the world, but little research has been conducted in emerging capital markets in Eastern and Southern Europe.

This paper aims to answer the following research questions: is there a positive relationship between higher ESG scores and firm performance in emerging markets? Do higher ESG scores reflect that companies with sustainability practices are indeed returning better profits? Or are traditional ESG scores in emerging markets misleading, given the limited data available?

2 Literature Review

Scholars around the world have explored the relationship between sustainable investment and firm performance - the academic literature published over the last four decades presents enough empirical data to support a strong link between ESG factors and the positive impact they have on firm performance and a company‘s bottom line (Brooks, 2018; Ding, 2022; Eliwa, 2021; Grote, 2022; Ting, 2019; Yu, 2021).

Friede’s (2015) study provides an extensive review of academic research on the relationship between ESG criteria and corporate financial performance (CFP), with a comprehensive analysis of over 2200 individual studies, amounting to the most exhaustive overview of the topic to date. The results show that approximately 90% of the studies find a non-negative relationship between ESG and CFP, stable over time and across different regions and asset classes, thus reinforcing the idea that higher ESG scores translate into better financial performance.

In their 2016 paper, Khan and Serafeim (2016) investigate how corporate sustainability impacts financial performance by analyzing data from 2396 firms, and discover that sustainability issues relevant to a company's operations, stakeholders, and the environment can significantly affect financial performance. The Khan study suggests that companies prioritize such issues to create value for stakeholders and improve financial performance, but the impact differs depending on the industry and specific sustainability issues.

Cappucci (2018) insists that ESG inclusion into investment strategies is not for the half-hearted, and that layering up a few sustainable principles on top of a traditional investment approach is not only unsuccessful, but unnecessarily costly for a firm, and instead presents evidence to show that a systematic and explicit framework for ESG incorporation is what ultimately increases firm performance.

Odell (2016) argues that active ownership and investors using more than an ESG quantitative scoring methodology and incorporating the more qualitative ESG aspects into their valuation models and decision-making results in higher returns and a better mitigation of risks. Odell (2016) also makes a vital distinction between CSR and ESG factors, with CSR embodying a more charitable approach, autonomous from the core commercial enterprise, whereas ESG factors translate into policies

and strategies that drive long-term value creation for the firm. Overall, Odell believes that combining material ESG factors with conventional investment due diligence can result in better investing strategies (Odell, 2016).

Kotsantonis (2019) expresses skepticism about just how precisely ESG data reflects firm performance, claiming that data inconsistency in how different companies report poses an incredible challenge in measuring ESG investment and performance. For more context, Kotsantonis used a randomized selection of 50 Fortune 500 companies and manually collected information on how they report on a specific sustainability issue (employee health and safety) and found over 20 different reporting styles, with distinct terminology and units of measure. Given the complicated reality of ESG data providers using different industry classifications, building their individual models for scoring and applying different methodologies to interpret the identical publicly available data, Kotsantonis encourages data providers to establish best practices and become more transparent about their methodologies and the trustworthiness of their data (Kotsantonis, 2019).

Mobius (2021) argues that in emerging markets, off-the-shelf ESG solutions such as ESG ratings are no replacement for deep research and expertise in the company's industry and sector in which it operates, with ESG ratings seen as backward-looking and failing to provide investors with that needed competitive edge.

Jain (2019) finds no significant differentiation in performance between financially established and sustainable indices and advises investors on how to gain more insight by considering both indices types when structuring their portfolios, with a hedging and diversification strategy in mind.

3 Methodology

To investigate the relationship between ESG scores and firm performance, we posed two main research questions to explore if sustainable business activities contribute to better company performance and if the limited data available in European emerging markets negatively impacts observed correlations.

Our study aimed to analyze the correlation between ESG scores and financial metrics (ROA, ROE, P/E, Debt-to-Equity), with a focus on individual ESG pillars to determine which factor drives financial performance. Using Refinitiv Eikon

Screener database, I gathered data for 2706 listed companies from 18 emerging markets in Eastern and Southern Europe for the period of 2018-2022. Out of the 2706, only 73 companies reported ESG scores, and we used the three separate ESG pillars as independent variables to identify key drivers of financial performance.

We analyzed 5-year panel data from listed companies in emerging Eastern and Southern European markets to assess the link between ESG factors and firm performance. All the panel data was extracted from financial annual statements downloaded from Refinitiv Eikon. We ran a STATA regression analysis, considering winsorized independent variables (including ESG Score, E Pillar Score, S Pillar Score, and G Pillar Score calculated by Refinitiv Eikon) and dependent variables (ROA, ROE, P/E, and Debt-to-Equity) while controlling for Total Assets (natural logarithm) and the time dimension. Companies without an ESG score or with missing data were excluded from the sample, leaving firms from 8 countries: Cyprus, Czech Republic, Gibraltar, Greece, Hungary, Malta, Romania, and Slovenia.

4 Results

Table 1 provides an overview of the variables ROA, ROE, P/E, ESG Score, E Score, G Score, S Score, and Total Assets. We ran multiple regressions to test for correlations between ROA, ROE and ESG Scores (consolidated and individually), with Debt/Equity used as a control variable (Table 2).

Table 1: Descriptive statistics and data visualization

Variable	Obs	Mean	Std. dev.	Min	Max
Return on Assets	**182**	**.0599027**	**.0549828**	**.0008681**	**.2486204**
Return on Equity	**182**	**.1540089**	**.1053267**	**.0063114**	**.4722753**
Price/Earnings	**182**	**14.82887**	**9.980482**	**1.867327**	**37.01501**
ESG Score	**182**	**50.88476**	**18.9186**	**5.121528**	**85.15359**
Env. Score	**182**	**41.87206**	**25.85827**	**0**	**90.9751**
Social Score	**182**	**53.04013**	**23.69585**	**2.711288**	**97.146**
Governance Score	**182**	**57.80342**	**29.25279**	**4.135611**	**146.1973**
Total Assets	**182**	**8.024446**	**1.771755**	**4.519275**	**11.33807**

Table 2: Regression Results: Correlation test between Return on Assets & ESG

Source	SS	df	MS	Number of obs	=	182
				F(3, 178)	=	23.93
Model	.157275042	3	.052425014	Prob > F	=	0.0000
Residual	.389906879	178	.002190488	R-squared	=	0.2874
				Adj R-squared	=	0.2754
Total	.547181921	181	.003023105	Root MSE	=	.0468

Return on Assets	Coefficient	Std. err.	t	P>t	[95% conf. interval]	
ESG Score	.0000135	.0002364	0.06	0.955	-.000453	.0004799
Total Assets	-.015918	.0025285	-6.30	0.000	-.0209078	-.0109283
Debt/Equity	-.0156208	.0049957	-3.13	0.002	-.0254792	-.0057623
_cons	.1975541	.016727	11.81	0.000	.1645453	.2305629

The correlation coefficient (r) of 0.16 indicates a weak positive correlation between the ESG Score and Total Assets. This means that as the ESG score increases, Total Assets tend to increase slightly as well, but the relationship is not very strong. The t-value of 0.06 also suggests that the relationship between ESG score and Total Assets is not statistically significant.

Table 3: Regression Results: Correlation test between Return on Assets & Env. Score

Source	SS	df	MS	Number of obs	=	182
				F(3, 178)	=	23.94
Model	.157322035	3	.052440678	Prob > F	=	0.0000
Residual	.389859886	178	.002190224	R-squared	=	0.2875
				Adj R-squared	=	0.2755
Total	.547181921	181	.003023105	Root MSE	=	.0468

Return on Assets	Coefficient	Std. err.	t	P>t	[95% conf. interval]	
Env. Score	.0000259	.0001647	0.16	0.875	-.0002991	.0003509
Total Assets	-.0160454	.0024061	-6.67	0.000	-.0207936	-.0112972
Debt/Equity	-.0156735	.0050071	-3.13	0.002	-.0255543	-.0057926
_cons	.198213	.0173022	11.46	0.000	.164069	.2323569

Table 4: Regression Results: Correlation test between Return on Assets & Social Score

Source	SS	df	MS	Number of obs	=	182
				F(3, 178)	=	24.09
Model	.158012687	3	.052670896	Prob > F	=	0.0000
Residual	.389169234	178	.002186344	R-squared	=	0.2888
				Adj R-squared	=	0.2768
Total	.547181921	181	.003023105	Root MSE	=	.04676

Return on Assets	Coefficient	Std. err.	t	P>t	[95% conf. interval]	
Social Score	**.0001083**	**.0001856**	**0.58**	**0.560**	**-.000258**	**.0004747**
Total Assets	**-.0167045**	**.0024737**	**-6.75**	**0.000**	**-.021586**	**-.011823**
Debt/Equity	**-.0161186**	**.005061**	**-3.18**	**0.002**	**-.0261058**	**-.0061314**
_cons	**.1991412**	**.0169215**	**11.77**	**0.000**	**.1657486**	**.2325337**

The t-value of 0.58 indicates that the coefficient for the Social Score variable is not statistically significant. This means that the estimated relationship between the Social Score and Total Assets is likely due to chance variation and is not strong enough to be considered a true relationship. The R-squared value of 0.2888 suggests that only about 29% of the variation in total assets can be explained by the variation in the Social Score variable. The adjusted R-squared value of 0.2768 is slightly lower and considers the number of variables in the model.

Table 5. Regression Results: Correlation test between Return on Assets & Governance Score

Source	SS	df	MS	Number of obs	=	**182**
				F(3, 178)	=	**24.10**
Model	**.158068473**	**3**	**.052689491**	Prob > F	=	**0.0000**
Residual	**.389113448**	**178**	**.002186031**	R-squared	=	**0.2889**
				Adj R-squared	=	**0.2769**
Total	**.547181921**	**181**	**.003023105**	Root MSE	=	**.04676**

Return on Assets	Coefficient	Std. err.	t	P>t	[95% conf. interval]	
Governance Score	.0000727	.0001202	**0.61**	0.546	-.0001645	.0003099
Total Assets	-.0159889	.001983	**-8.06**	0.000	-.0199021	-.0120758
Debt/Equity	-.015411	.0049941	**-3.09**	0.002	-.0252664	-.0055557
_cons	.1944609	.0174266	**11.16**	0.000	.1600716	.2288502

The t-value of 0.61 indicates that the coefficient for the Governance Score variable in a regression analysis is not statistically significant. This means that the estimated relationship between the Governance score and Total Assets is likely due to chance variation and is not strong enough to be considered a true relationship.

5 Discussion

The regression analysis suggests a weak and potentially insignificant positive association between the ESG Score and ROA. This finding implies the possibility of additional unaccounted factors that may exert a more substantial influence on ROA. The t-value of 0.06 suggests that the coefficient estimate does not significantly deviate from zero, indicating that the relationship between ESG Score and ROA may not achieve statistical significance at the conventional 0.05 level. Additionally,

the R-squared value of 0.2874 denotes that approximately 28.74% of the variation in ROA can be explained by the variation in ESG Score, revealing that the ESG Score's impact on ROA is not markedly robust, and other determinants likely also contribute to ROA.

The present study is subject to certain limitations, including a relatively low number of companies reporting on ESG scores in Eastern and Southern Europe, which is further compounded by the lack of available data over the selected 5-year period. Despite these limitations, the study provides valuable insights that can inform future research on the relationship between ESG and financial performance. As ESG reporting becomes increasingly mandated by legislation and market participants demand greater consistency and transparency in ESG data, new studies may emerge that are better equipped to analyze the specific ESG pillars that are most relevant to improved profitability. Policy makers can also leverage this knowledge to identify gaps in ESG reporting and draft regulations that target these missing data. Additionally, listed company decision-makers may be incentivized to incorporate more sustainable practices into their performance strategies if such practices lead to improved financial performance and greater investor preference.

6 Conclusion

This is a first attempt at drawing an impactful correlation between ESG factors and firm performance, with a focus on emerging European markets. The promise of ESG factors being the catalyst for a safer, more just world and a healthier planet while stimulating capital markets around the world to reward sustainable investments and enterprises is ever so appealing, but there is much work left to do. At this inflection point in time, most studies show that there is a positive ESG impact on capital markets, but emerging markets need to catch up, there is a dire need for standardization of how ESG information is reported and interpreted, and as Serafeim (2018) highlighted, it would be naïve of us to believe that the private sector, at company level, is and will be able to solve all the common good troubles we are facing.

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Corruption in Public Private Partnerships as a Barrier to Sustainable Development: The Case of Albania

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Abstract Public Private Partnerships (PPPs) are one of the forms used by governments to provide a better service for the benefit of the citizens. However, since these projects are of a large scale, the practices of corruption between the state and the private party undermine the value for money, influencing the economic development of the country and the distribution of public funds. In Albania, investments through Public Private Partnerships are highly discussed due to high corruption during the tendering phase, the selection of the winner, but also during the implementation of the project. Almost all PPP investments have been viewed as cases of corruption, and some have resulted in investigations by state authorities. Therefore, this paper aims to represent the potential scope and cost of corruption of PPPs in Albania and how they affect the sustainable development goals. The qualitative analysis reveals that PPPs and corruption have a positive relationship in Albania, implying the urgent need for an effective risk assessment and monitoring plan for PPPs to combat corruption and promote sustainable development.

Keywords:
public private partnerships, corruption, sustainable development goals, risk assessment, Albania

JEL:
H4, H42, D7

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1 Introduction

The United Nations established 17 Sustainable Development Goals in 2015, one of which is to improve infrastructure quality, sustainability, and accessibility for all (UN, 2015). But many developing countries still lack basic infrastructure and face financial challenges. To solve this problem, governments are using public-private partnerships (PPPs) to build and manage public infrastructure. PPPs involve a long-term agreement between a government entity and a private party, who bears significant risk and management responsibility (World Bank, 2018).

PPPs can enhance public infrastructure and services and alleviate government budget constraints through private investment. However, corruption in PPPs is a potential risk due to weak governance and institutional frameworks. Corruption can hinder sustainable development and weaken the effectiveness of PPPs in delivering infrastructure projects, especially in countries such as Albania, where corruption is a persistent problem and PPPs are seen as a solution. Therefore, it is important to study the link between corruption and PPPs in Albania to identify effective measures to minimize corruption risks and encourage sustainable development.

This paper aims to provide an overview of the existing literature on corruption in PPPs, as well as a case study of Albania, highlighting the key challenges and opportunities for promoting sustainable development in the context of PPPs.

This paper is organized as follows. Initially, a comprehensive review of the literature on PPPs and corruption will be presented. Additionally, another section will concentrate on corruption in PPP projects within Albania, treating some waste- to-energy PPP projects. It should be emphasized that the conclusions drawn in this paper are intended only to provoke further investigation and discourse on this topic.

2 Literature Review

Corruption in PPPs has been identified as a significant challenge that hinders the implementation of these arrangements and erodes trust in public institutions. The literature has examined this issue from different perspectives, with authors highlighting the causes and consequences of corruption, as well as strategies to prevent it. There are some factors which causes the corruption in PPPs.

One of the major causes of corruption in PPPs is the *lack of transparency and accountability* in *the decision-making process*. According to Schomaker (2020) the lack of clarity and disclosure of information about project financing, procurement, and operations creates opportunities for corruption. Similarly, Michele and Cabrera (2018) argue that a lack of clear governance structures and legal frameworks increases the likelihood of corruption in PPPs. Also, in a study of PPPs in Latin America, Wiss and Faria (2007) found that corruption was a significant problem, particularly in countries with weak governance and institutional frameworks. They argue that improving transparency and accountability, as well as building local capacity, can help address corruption in PPPs.

Another factor that contributes to corruption in PPPs is the *complex nature of these arrangements*. As noted by Hodge and Greve (2007), the involvement of multiple stakeholders with differing interests and incentives can create conflicts of interest and opportunities for rent-seeking behavior. Moreover, the use of complex financial instruments, such as public guarantees and tax breaks, can obscure the true cost of PPP projects and create opportunities for manipulation.

PPP projects are susceptible to corruption at all stages of the project, including the decision stage, tender stage, and contract execution. Dishonest transactions can occur during the tender and negotiation stages, leading to an unfair advantage for contractors. Quality monitoring is crucial during contract execution, and unforeseen circumstances may require changes in pricing or service terms, which may also be vulnerable to corruption. Corruption during contract execution may undermine the enforcement of the agreement (Iossa & Mortimort, 2011).

Another cause of corruption in PPPs is the *non-transparent procurement procedure*. To prevent this, measures like preparing feasibility studies beforehand, using open procedures, and implementing deterrents like penalties need to be in place. For instance, in Bulgaria, authorities investigated allegations of corruption in a PPP water project through a judicial process, which serves as a deterrent to future individuals who may attempt to bypass established procedures for their own gain (UNECE, 2004).

The consequences of corruption in PPPs are also significant. Apart from the financial losses incurred by the public sector, corruption can lead to a loss of public trust in government institutions and reduce the legitimacy of PPPs as a tool for sustainable development.

Authors Michele and Cabrera (2018), Beatriz and Noemi (2022) show that corruption is associated with lower project quality and higher costs, and can prevent private sector investors. According to Iossa and Martimort (2014), corruption in PPPs can have severe consequences on sustainability, as it can result in reduced quality of services, higher costs for users, and loss of public trust in the partnership. Corruption can also discourage future investment in PPPs and hinder economic growth. To promote sustainability, the authors suggest implementing transparent procurement procedures, ensuring fair competition, and enforcing strong anti-corruption measures.

Furthermore, to prevent and combat corruption in PPPs, authors have suggested a range of strategies, including the use of effective governance frameworks, greater transparency and accountability and the involvement of civil society and the media.

For instance, Hodge and Greve (2007) recommend the establishment of independent oversight bodies to monitor PPP projects and UNECE (2004) suggest the adoption of legal frameworks that promote competition and prevent collusion between public and private actors.

In conclusion, the literature has identified corruption in PPPs as a significant challenge that hinders sustainable development. To address this issue, there is a need for greater transparency and accountability in decision-making processes, the establishment of effective governance frameworks, and the involvement of civil society and the media in monitoring PPP projects.

3 Methodology

The methodology utilized for analyzing PPP and corruption involves a qualitative research approach, which relies on a comprehensive analysis of relevant literature from both national and international sources. The literature sources also include data from government agencies such as the Ministry of Finance and Economy and

international organizations such as the World Bank and Transparency International. The literature review allows the identification of concepts, theories and mechanisms that have been used by different countries or should be used in the fight against corruption in PPPs, in order to promote sustainable development.

4 Results

Albania has made progress in transitioning to a market-based economy with a focus on infrastructure development, but corruption remains a persistent challenge, with a poor ranking in global corruption indices, including a ranking of 101 out of 180 countries in 2022 (Transparency International, 2023).

The Albanian government has recognized the potential of PPPs as a means of delivering infrastructure projects, and has implemented 228 PPPs, but 5 of them have been resolved, as a result the current number of concession/PPP contracts is 223. These contracts are in different sectors such as transportation, energy, health, waste managment and education, with a total contract value around 31% of GDP in 2021 (Ministry of Finance and Economy, 2022). Most of the projects in Albania are in the field of energy and transport, followed by projects in the health and waste management sectors, which often come with price or volume guarantees. These PPP contracts were awarded mainly through unsolicited proposals, and sometimes the lack of a competitive procurement procedure often prevented foreign investors from participating. Despite attempts by the government to bring in private capital through PPPs, the excessive use of these partnerships has led to significant contingent liabilities due to limited transparency and weak institutional oversight (IFC, 2022).

For 2021, a total of 14 PPP contracts with government budget support were identified, accounting for about 6% of total PPP contracts (*presented in Figure 1).* The total value of these PPP contract is around 1.95 billion Euro. These contract are distributed across various sectors including transportation, health, waste managment, education and fiscal sector.

All the sectors related are identified with high risk due to the various challenges related to inadequate infrastructure, the absence of competitive procurement processes and fluctuations in demand (IFC, 2022). This paper will focus only on 3 projects with budgetary support, those in waste management sector.

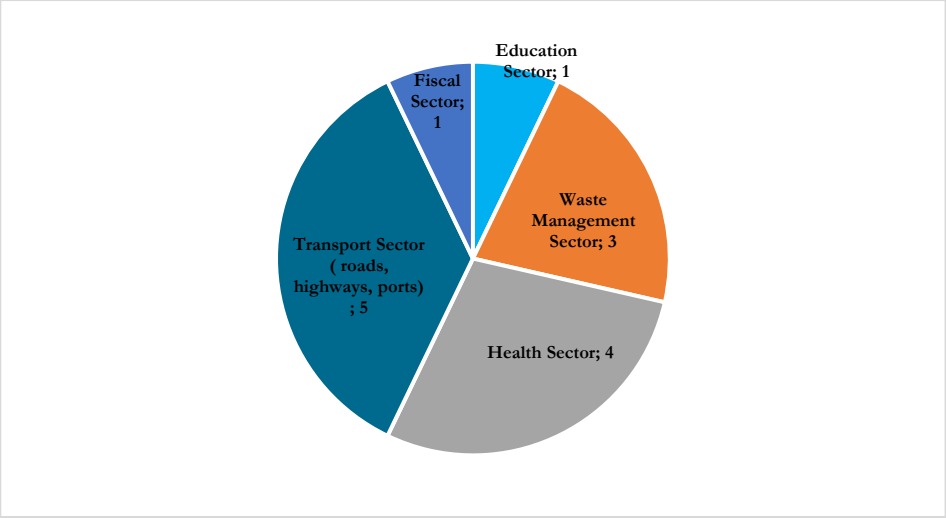

Figure 1: Number of the PPPs contract with budgetary support by sectors
Source: Ministry of Finance and Economy (2022)

Recently, three PPP projects in the waste management sector have been found to be linked to corruption. The government of Albania granted agreements to construct three waste-to-energy incinerators using public-private partnership project schemes in Elbasan (approved in 2014 with a total investment value about 21.7 million Euro), Fier (approved in 2016 with a total investment value about 27.3 million Euro), and Tirana (approved in 2017 with a total investment value about 124.2 million Euro). The total investment value of the three incinerators is around 173.2 million Euro (ATRAKO, 2022).

According to the Transparency International (2020), the companies that received the contracts from the government were the only ones to bid in all three cases. The case of the incinerator in Tirana is a prime example of how corruption can undermine PPPs in Albania. The bidding process for the project was criticized for being opaque and non-competitive, with allegations of government officials

receiving bribes to ensure that the contract was awarded. The private company has not built yet the plant, so actually the total waste of Municipal of Tirana are landfilling or burning for elimination.

Similarly, the Fier incineration PPP project has faced criticism from environmental and community groups, who argue that the incinerator poses a risk to public health and the environment. There have also been concerns raised about the lack of transparency in the bidding process and allegations of corruption involving government officials and private companies involved in the project.

Furthermore, for the Elbasan incineration PPP project, Elbasan winner put forward unsolicited proposals and obtained a contract without undergoing a tender process. Additionally, key persons in the awarded companies share business partnerships, raised concerns about favoritism and potential corruption. So, due to allegations of links between politicians and high-ranking officials, including ministers and mayors, with the incinerator scheme, there have been convictions handed down by the judicial system for this three projects (Transparency International, 2020).

In addition, these projects with PPP have a very high budget cost as they all have budget support for the amount of waste deposited by the municipalities, estimated about 93 million Euro in total for 2015-2021 (Ministry of Finance and Economy, 2022).

As it is shown above, the impact of corruption on PPPs in Albania is significant resulting in higher budget costs, lower quality results, and loss of public trust. Also, corruption has undermine the potential benefits of PPPs for sustainable development, such as improved infrastructure and enhanced service delivery.

However, there have been taken some measure to monitor the operation of these PPPs contract as well as the risks derived from them. In 2018, the Ministry of Finance and Economy in Albania established a Fiscal Risk Unit to manage fiscal risks arising from PPPs implemented by line ministries during the restructuring process. However, the unit still lacks capacity. Despite efforts to improve the system, transparency around PPPs remains limited. To address the issue, additional capital financing, clear frameworks for administrative tariffs, and improved institutional planning and oversight capacities are required (IFC, 2022).

Berisha et al. (2022) identify critical success factors for implementing PPPs in Albania. Results showed that for Albania identifying the right project and financial capacity are the most important critical sucess factor. Trust, openness, fairness, negotiation, and a defined revenue stream were also identified as important factors since the partnership between the private and public entities is perceived with skepticism by the general public and mostly considered as based on corruption.

Overall, the relationship between corruption and PPPs in Albania is complex and multifaceted. By examining the challenges and opportunities for promoting sustainable development in this context, it is possible to identify effective measures to mitigate corruption risks and promote the positive impact of PPPs on infrastructure development and sustainable development in Albania.

5 Discussion and Conclusion

PPPs are increasingly being used to build and manage public infrastructure, with the aim of improving infrastructure quality, sustainability, and accessibility but corruption can hinder their ability to promote sustainable development. Corruption can occur at various stages of PPPs, including project selection and execution. Factors that contribute to corruption in PPPs include a lack of transparency, complex arrangements, and inadequate institutional and governance frameworks in certain countries. The negative effects of corruption in PPPs are severe and include monetary losses, a decline in public confidence in government institutions, and reduced credibility of PPPs as a tool for sustainable development.

The Albanian government has implemented in total 228 PPPs (with total contract value equivalent to 31% of the country's GDP in 2021) in various sectors, including transportation, health, energy, waste management, and education. A total of 14 PPP projects are with budget support, accounting for about 6% of total PPP contracts, with a total value around 1.95 billion Euro. But, despite the Albanian government's efforts to use PPPs to improve infrastructure, limited transparency and weak institutional oversight have led to significant contingent liabilities. Corruption has been identified as a significant challenge, with recent cases involving waste management projects leading to convictions. This projects have a very high budget cost as they all have budget support for the amount of waste deposited by the municipalities, estimated about 93 million Euro in total for 2015-2021.

Our qualitative analysis reveals that PPPs and corruption have a positive relationship in Albania, implying the urgent need for an effective risk assessment and monitoring plan for PPPs to combat corruption and promote sustainable development. Strengthening governance and institutional frameworks, increasing transparency and accountability, and promoting stakeholder engagement can help to mitigate corruption risks and promote sustainable development outcomes.

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AN OVERVIEW OF THE ACTIVE LABOUR MARKET PROGRAMS IN ALBANIA

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Abstract Active labour market policies (ALMPs) are publicly financed interventions intended to improve the functioning of the labour market by inducing changes in labour demand and labour supply, as well as their matching process. Among the most common programs used are training courses, job search assistance and monitoring, subsidized employment, and public work programs. The purpose of this paper is to present some theoretical concepts about the importance of ALMPs and current ALMPs in Albania, and the budget funds allocated for these programs in the past years. Albania is currently implementing different ALMPs, foreseen and approved with different Decisions of the Council of Ministers (DCM). In 2019, there was a reform in the employment promotion programs in Albania, by designing new ALMPs which would be standard in frame but individualized in terms of addressing different vulnerabilities. All programs rely on the principle of subsidizing the employer. Labour market program is one of the budgetary programs, according to the budget classification rules for state budget in Albania. Funds allocated for ALMPs are part of this program and are classified in the economic account "subsidies".

Keywords:
labour market policy, active labour market programs (ALMPs), budget allocation, COVID-19, subsidies

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E24, E62, H61

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1 Introduction

Unemployment is one of the most challenging economic and social problems in both developed and developing countries. The challenge is exacerbated by the fact that across countries worldwide youth unemployment figures are typically twice the overall unemployment rate. Policymakers worldwide therefore struggle to find effective programs that can help the jobless find jobs and that increase workers' productivity and labor income. Job training and other active labor market programs (ALMPs) have been promoted as a remedy for cyclical and structural unemployment (Kluve, 2016). ALMPs are needed to support the labor market integration of groups with major employment obstacles. According to Caliendo and Schmidl (2016), most European countries spend significant resources each year on active labor market programs (ALMP) with the aim of improving the integration prospects of struggling youths.

According to the European Centre for Social Welfare Policy and Research, Active Labor Market Policies (ALMPs) describe measures to help individuals enter the labor market or to prevent already employed individuals from losing their jobs. ALMPs include various measures, from training to job search assistance, subsidies, supported employment opportunities and programs to support entrepreneurial activities. Among the most common programs used are training courses, job search assistance and monitoring, subsidized employment, and public work programs.

Albania is currently implementing different ALMPs, foreseen and approved with four different Decisions of the Council of Ministers (DCM). The programs are being implemented by the Albanian National Agency for Employment and Skills. The purpose of this paper is to present some theoretical concepts about the importance of ALMPs and current ALMPs in Albania, and the budget funds allocated for these programs in the past years. The funds allocated for ALMPs are compared to the total funds allocated for the "labor market" budgetary program, to get some conclusions whether the share of ALMPs on the total funds is appropriate. The idea is to connect the expenditure with the importance that these programs have, suggesting that there should be more funds allocated if these programs represent a priority for the government.

2 Theoretical Background

Active labor market policies (ALMPs) are publicly financed interventions intended to improve the functioning of the labor market by inducing changes in labor demand and labor supply, as well as their matching process. Specifically, these policies aim to preserve existing jobs and create new employment opportunities, encouraging labor market attachment and the reintegration of long-term unemployed and inactive individuals, and facilitating the job-search and job-matching process (Ernst et al., 2022).

The evolution of active labor market policies dates back to the 1960s. In the early phase, "active manpower policies" were designed to respond to the fast-growing demand side of the economy. According to an OECD legal instrument of that time, the idea was that employment and output could be expanded by removing labor market bottlenecks. The changing economic and labor market conditions of the 1970s and 1980s brought new policy requirements. The focus shifted to addressing the problems of slow growth and the rising trend in unemployment. With the OECD economies facing continued labor market difficulties during the expansion phase of the cycle in the 1980s, it became apparent that structural difficulties lay behind high unemployment and other labor market problems (OECD, 1964).

ALMPs may be targeted at specific groups, e.g., youths, long-term unemployed, displaced workers, welfare recipients etc. or not. They also vary widely across countries. In some countries, programs are the responsibility of the Public Employment Service (PES); others receive only referrals from it. Some programs may be administered at the federal level, others at regional or local levels. Funding may be centrally governed or jointly funded with various regions. Young individuals entering the labor market are generally considered to be an at-risk population. They face a higher risk of unemployment than older workers, are more likely to switch between states of joblessness, training and working, and are more likely to enter temporary or precarious types of employment (Caliendo & Schmidl, 2016).

The role of ALMPs is related to the broad economic situation. At times of rapid expansion and labor shortage, like the 1950s and 1960s, their key objective was to upskill the workforce. After the oil shocks of the 1970s, the raison d'être of ALMPs shifted from economic to social policy, and since the mid-1990s, we see the development of a new function, well captured by the notion of activation, which

refers to the strengthening of work incentives and the removal of obstacles to employment, mostly for low-skilled people (Bonoli, 2011).

Active labor market programs (ALMPs) aim to keep workers employed, bring them into employment, increase their productivity and earnings, and improve the functioning of labor markets. ALMPs that improve labor market matching are highly beneficial, but effective only in the short run. ALMPs in general might be more cost effective over the long term (3-10 years) and some may even be self-financing, suggesting that long-term evaluations are needed to better ascertain the impact of individual policies (Brown & Koettl, 2012).

The chances of success of an ALMP depend on several factors, including the characteristics of the labor markets in which they operate. Hence, it is important to avoid assessing ALMPs in isolation (Fay, 1996). The most common outcome on which evaluations focus is whether the individual gets a job and/or experiences earnings gains following a program. But it is also important that evaluations consider carefully the different possible outcomes from an ALMP, e.g. employment, unemployment, participation in another labor market program, or non-participation. An individual may experience stable or falling earnings following participation in a program because of unemployment, enrolment in another program, or in the case of training, enrolment in further education. The policy implications of each situation, however, are quite different (Fay, 1996).

3 Methodology

The methodology used to present the current ALMPs in Albania and the share of the budget funds for ALMPs compared to the total budget funds for "labor market", is based on qualitative and quantitative data. The first part, focusing on the literature review, is based on the review of different authors and institution's reports regarding this topic. This part presents the theoretical concepts regarding the active labor market programs, the definition, their importance in reducing unemployment and evolution over time.

The information regarding ALMPs in Albania has been collected from national statistics and institutions, namely National Employment and Skills Agency and Ministry of Finance and Economy (MFE). The data regarding the financing figures for ALMPs has been retrieved from the official site of MFE. Funds allocated for

ALMPs are part of "labor market" budgetary program and are classified in the economic account "subsidies" in the national Albanian currency, the Albania Lek (ALL). For the purpose of this paper, the funds have been converted to Euros with the exchange rate for January for each respective year.

Since ALMPs funds comprise only current expenditures, in this article we will compare the funds allocated for ALMPs to the total current expenditures for the labor market program. All the budgetary figures that are presented in this paper refer to the initial budget approved in parliament, not the revised budget during the year. This is because the revisions during a budget year, that usually result in a reduction of the initial allocated funds, can be due to several factors, like the earthquake, pandemic, lack of revenues etc., which are not directly connected with government priorities.

4 Results

In 2019, there was a reform in the employment promotion programs in Albania, by designing new ALMPs. The main aim of the reform was to design active labor market programs, standard in frame, but individualized in terms of addressing different vulnerabilities. All the programs rely on the principle of subsidizing the employer, different from the design prior to 2019, where the subsidy went directly to the jobseeker/employee. In Albania the responsible institutions for the ALMPs implementation is the National Employment and Skills Agency. The current programs in Albania are Wage-Subsidy Program, On-the-Job Training Program, Internship Program, COVID-19 Employment Recovery Program, Community Employment Program and Self-Employment Program. Although the programs differ from each other and target different groups, in general we can say that there is a special focus on youth.

The wage subsidy program targets: all unemployed jobseekers registered and active, for no less than 3 (three) months in the employment office, young people under 29 (twenty-nine) years old, long-term unemployed jobseekers, jobseekers over 45 (forty-five) years old, unskilled unemployed jobseekers, unemployed jobseekers, who have returned for no more than 2 (two) years from emigration, jobseekers who benefit from economic aid, treating with priority the beneficiaries of economic assistance, who are expected to leave the economic aid scheme in the current year and the following year, jobseekers who receive unemployment benefits for more

than 3 (three) months, persons with disabilities, victims of trafficking, gender-based violence and victims of domestic violence, jobseekers from the Roma and Egyptian community, persons who have completed the vocational training course or the training program through work and are still unemployed 6 (six) months after completion.

Internship Program, targets are all unemployed jobseekers who are newly graduated, up to the last 24 (twenty-four) months after graduation, who are registered as unemployed jobseekers.

Community Employment Program targets all unemployed jobseekers registered and active, for no less than 12 months at the employment office, aged over 25.

The subsidy foreseen for the programs comprises:

- social and health contributions, calculated based on the minimum wage, offered throughout the duration of employment, compensated monthly.
- salary financing in the amount of 100% of the national minimum wage, for different periods depending on different beneficiaries. For the victims of trafficking, gender-based violence, victims of domestic violence and for persons with disabilities, the salary is compensated respectively for 6 and 12 months.
- contributions for insurance against accidents at work
- different additional costs like: bonuses for transport costs; single parents with a child under 6 (six) years old receive a bonus attending kindergartens and nurseries for dependent children; bonus for employers for the reasonable adjustment of the workplace for disabled persons.

Labor market program is one of the budgetary programs, according to the budget classification rules for state budget in Albania. Funds allocated for ALMPs are part of this program and are classified in the economic account "subsidies". Like all the budgetary programs, the public expenditures allocated for the “labor market”, are divided into current and capital expenditures. The current expenditures comprise wages, social contributions, subsidies, transfer etc. Since ALMP funds are part of current expenditures, in this article we will compare the funds allocated for ALMPs to the total current expenditures for the labor market program.

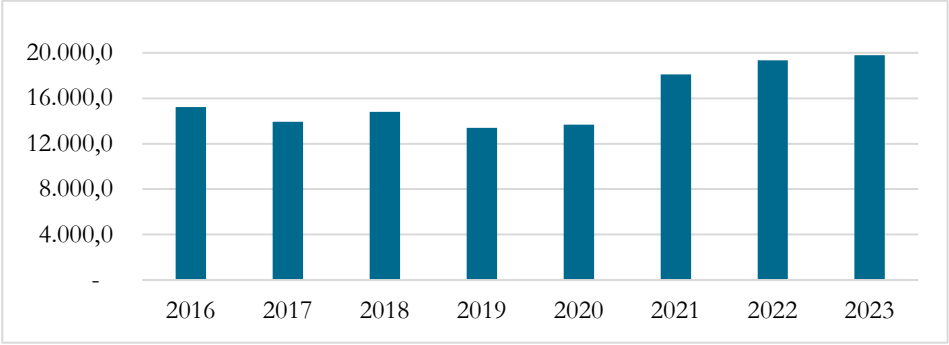

Figure 1: Current expenditures for labor market, in Euros, 2016-2023
Source: MFE (2023), Author's calculations

According to the official data of the Ministry of Finance and Economy, over the past few years, there has been an increase in budget expenditures, both current and capital, for the labor market. This is particularly evident after 2020, where the total amount of current expenditures increased by about 40% compared to 2019 (see Figure 1).

Meanwhile, funding for employment promotion programs has been low, compared to the total financing figures for the labor market. As it is clear from all the analyzed data, the total funds for ALMPs represent on average 25% of the total funds allocated for the labor market program through the analyzed years. In general, except for 2019, the financing has been quite the same in terms of %, between 23.3% and 25.7% (see Figure 2).

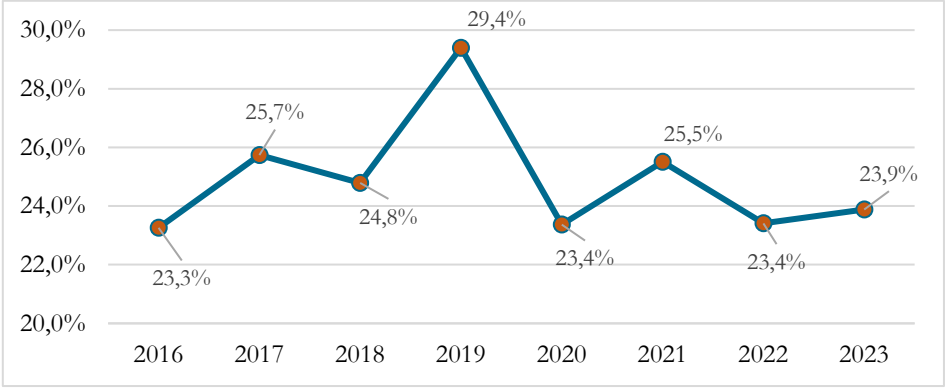

Figure 2: ALMPs funds compared to "labor market" funds, in %
Source: MFE (2023), Author's calculations.

One of the most successful programs has been the COVID-19 employment recovery program. As a result of COVID-19, many businesses were closed for a certain period, leaving many people without work. In addition to budgetary policies, the government also used employment policies to cope with some of the consequences. In this context, it was approved. The Decision of the Council of Ministers No. 608, dated 29.07.2020 "On the procedures, criteria and rules for the implementation of the employment promotion program through the employment of persons who became unemployed as a result of COVID-19. The aim of this employment program was to reintegrate into the labor market all unemployed job seekers who have become unemployed as a result of COVID-19, identified by the General Directorate of Taxes and registered in the employment office. The program itself offered 4-month, 8-month and 12-month employment programs:

- 4-month employment program: Salary financing at the rate of 100% of the national minimum wage for 2 (two) months and financing for 4 (four) months of mandatory social and health contributions.
- 8-month employment program: Salary financing at the rate of 100% of the national minimum wage for four months and financing for 8 (eight) months of mandatory social and health contributions.
- 12-month employment program: Financing for 12 (twelve) months of mandatory social and health contributions (employer and employee) in the amount of 100% of the national minimum wage of (27.9%), compensated for each month, throughout the duration of the program.

This program managed to employ a total of 220 people in its 3 components (4, 8 and 12 months) throughout Albania. Most of the employed persons were over 50 years old, this category which makes it more difficult to integrate into the labor market.

5 Discussion and Conclusion

Policymakers worldwide struggle to find effective programs that can help the jobless find jobs and that increase workers' productivity and labor income. Job training and other active labor market programs (ALMPs) have been promoted as a remedy for cyclical and structural unemployment. Albania is currently implementing different ALMPs, foreseen and approved with four different Decisions of the Council of

Ministers (DCM). All the programs rely on the principle of subsidizing the employer, different from the design prior to 2019, where the subsidy went directly to the jobseeker/employee. Over the past few years, there has been an increase in budget expenditures, both current and capital, for the labor market. Meanwhile, funding for employment promotion programs has been low, compared to the total financing figures for the labor market, on average 25% of the total funds allocated for the labor market program through the analyzed years. The Albanian government has stated that these programs represent a very important tool to decrease unemployment especially among the vulnerable groups (people with disabilities, Roma and Egyptian communities, returned emigrants, victims of trafficking, etc.). In this case, the budget funds allocated for these programs should increase to be in line with the government priorities and create better incentives and opportunities for the programs to address more unemployed jobseekers by having more funds available.

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PUBLIC AND PRIVATE FINANCING INSTRUMENTS TO SUPPORT SDGS: THE CASE OF ALBANIA

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Abstract The purpose of this paper is to identify and promote actions to finance the SDGs by bringing together governments, the private sector and the civil society. Following the rule 'it takes money to make money', the tight fiscal space of Albania is analysed to present potential approaches that can boost private financing leverage. Private finance is the main contributor to support the SDGs, while public finance has a small financing weight in the whole integrated financial framework, so this minor financing weight can be used to leverage private finance sector. This combination of finance instruments aims to provide sustainable financing for SDGs. This paper presents the process to reach a sustainable financing mechanism of SDGs in Albania. Additionally, it presents the tools, like Development Finance Assessment (DFA) and Integrated National Financing Frameworks (INFFs) that lead the country to link finance with results for delivering the SDGs. The paper provides a methodological approach, among others, to support SDGs sustainable financing in order to reach the SDGs targets. This research might bring implications for other developing countries in relation to financing SDGs.

Keywords:
SDGs,
DFA,
INFF,
financing instruments,
sustainability

JEL:
E61, O11, O23

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1 Introduction

The Government of Albania is committed to the 2030 Agenda for Sustainable development, which corresponds to the fulfillment of 17 goals and 169 targets. Many challenges are presented in the fulfillment of these goals, 9 out of 17 continues to be significantly challenging. Figure 1 shows Albanian SDG Dashboards and Trends 2022.

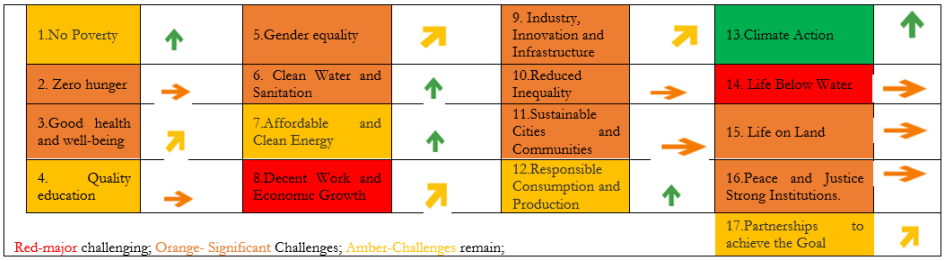

Figure 1: Albanian SDG Dashboards and Trends 2022
Source: Sustainable Development Report (2022) and Author's illustration

This overview demonstrates the highest need to intervene for complying with Agenda 2030, struggling with five critical dimensions: people, prosperity, planet, partnership and peace, also known as the 5Ps. SDG 8 is one of the most challenging goals, characterized by an economic growth with high volatility which is greatly affected by any shock, such as the Covid 19 pandemic reflected by negative growth in 2020 (see Figure 2).

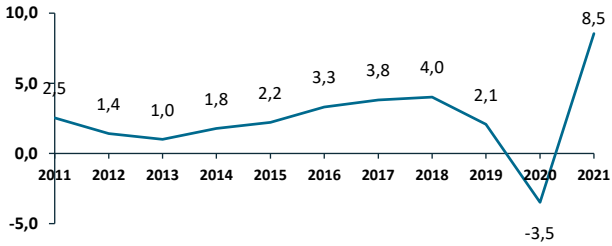

Figure 2: Albanian Real GDP growth in %
Source: Ministry of Finance and Economy (2022).

To achieve SDGs, their alignments with country's social, economic and environmental priorities is required. The accurate assessment and calculation of

financial costs as well as the identification of financial options for the fulfillment of development objectives continue to remain a challenge for the Albanian government. Still in the budgeting process of national strategies, deficiencies in the costing process continue, making it difficult to identify the necessary public financial resources, while the contribution of private finances remains even more difficult to calculate. The medium-and long-term national priorities according to a medium term and long-term macroeconomic framework is materialized in the National Strategy for Development and Integration (NSDI) document. 2021-2030 NSDI timeframe, which is under preparation process, corresponds with the European Policy Cycle (7 years), the cycle of the Instrument for Pre-Accession- IPA and the SDGs (due in 2030). Successive crises, such as the November 2019 earthquake and the COVID-19 pandemic, have exacerbated existing weaknesses and tightened the country's fiscal space, making the Sustainable Development Agenda even more urgent. This context demonstrates urgent need of institutions to intervene. The UN Joint Program 'Strategic Policy Options for SDG Financing', which aims to support SDG financing in Albania, has started to be implemented in 2020. It aims to bring evidence on the costs of not investing in the SDGs, as well as identify and evaluate options to catalyze financing to unfunded objectives in and identify innovative approaches, tools and other financing mechanisms to pilot and evaluate the impact of fiscal policies. This paper aims to analyze the potential sources of public and private finance in Albania and to present a roadmap to integrate financial sources for SDGs budgeting.

2 Literature Review

Success in achieving the SDGs is hampered by severe financial constraints facing developing countries and not only, constraints that have been severely exacerbated by the Covid-9 pandemic and the war in Ukraine. In addition to maintain peace and reducing geopolitical tensions, the key to achieving the SDGs is to devise a plan for financing them (UN, 2022).

As presented by Hege & Brimont (2018), a starting point for the integration of Agenda 2030 and in national policies and to implement the Sustainable Development Goals (SDGs), is the integration of SDGs into national budgeting processes.

For developing countries, costing the SDGs is essential to secure the investment and development assistance needed to achieve the SDGs. this process can help governments, donors and international organizations develop strategies for achieving specific SDG targets (Vorisek & Yu, 2020).

The implementation of the UN 2030 Agenda, according to a UN study, is estimated to cost between USD 3.3–4.5 trillion per year to fund different projects, development programs and various initiatives which help countries achieve these ambitious goals. Developing countries face an average annual funding gap of USD 2.5 trillion.

Government-driven or multilateral aid institutions-led support needs to be complemented by the private sector and the abundant funds that are available on the markets. The task for policymakers and private sector investors is, therefore, to coordinate and look for more innovative approaches. As far as the European region is concerned, the adoption of the European Green Deal is a game changer which sets the stage by introducing clear goals and investment needs to turn the economy around by 2050 (Lukšić et al., 2022).

According to several international assessments, investment needs for the SDGs are huge, with the bulk in developing countries and their infrastructure. The scale of current financial flows is considered insufficient: as public finance is in scarce supply, while private finance is constrained by risk and return requirements. If this resulting financing gap remains unresolved, investment needs will grow over time because of a cumulative effect. Several doubts could be raised: should we conclude that the SDGs are beyond reach, or could business models be rethought in ways that would increase SDG serving financial flows, but also make them less risky, and could the cost of achieving the SDGs be brought down? Figure 3 shows SDG annual financing gap - advanced vs. EMDEs (in trillion $).

In advanced countries, about 90% of investment needs can be met in advanced countries under current conditions, and public sector could cover only a third of the financing needs, with the private sector covering most of the rest. In developing and emerging countries, only 48% of SDG investment needs are being met, while public and private financial flows are of comparable size and the share of private finance in these countries would need to double to approach that of advanced countries. (UNEPFI, 2018,10-11,).

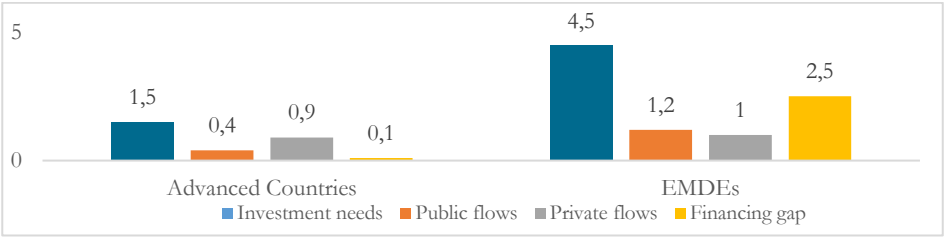

Figure 3: SDG annual financing gap - advanced vs. EMDEs (in trillion $)
Source: UNEPFI (2018)

In Albania, there is no identification of what part of investment needs can be met. All the findings presented above demonstrate as a starting point for achieving the SDGs: assessing their costs, integrating them into the national budgeting process and exploring innovative financing instruments, beyond traditional finance such as public funds. The following sections briefly present: paper methodology, results found and concluding remarks.

3 Methodology

A general quantitative and qualitative analysis of public and private finances has been carried out to provide a methodological approach to the steps that a country like Albania is following to finance the SDGs. The limitation of this work is the lack of determining the amount of private finance funds needed to finance the SDGs, while public finance goes all without exception to their financing. This task requires a later stage, such as the drafting of a strategy for the integrated national financial framework. Using secondary data on key indicators of public and private finances in the country provided by official institutions such as: Bank of Albania, Ministry of Finance and UN Albania, an overview of the financial resources that have the most potential to support sustainable financing of the SDGs that a developing country needs to undertake is provided.

4 Results

Considering above finding for developing countries, where Albania belongs, less than half of financing needs for SDGs fulfilment are in place. Also, private finances, which should cover the major investments needs, remains lower than public findings. In order to follow advancing countries model, most effort should be undertaken to leverage and mobilize private financing.

4.1 Public Finances

Governments and public finances have an important role in creating the conditions and incentives that can unlock domestic and international private financing, and to promote business strategies and operations that are aligned with priorities for recovery and sustainable development. Unlocking and boosting private capital for SDG related investments requires policy and regulatory shifts, better access to information on investment opportunities, and clear standards on the criteria for identifying SDG aligned investments. The development of an integrated approach to public policies for private finance is at the heart of the innovation of the integrated national financing framework.

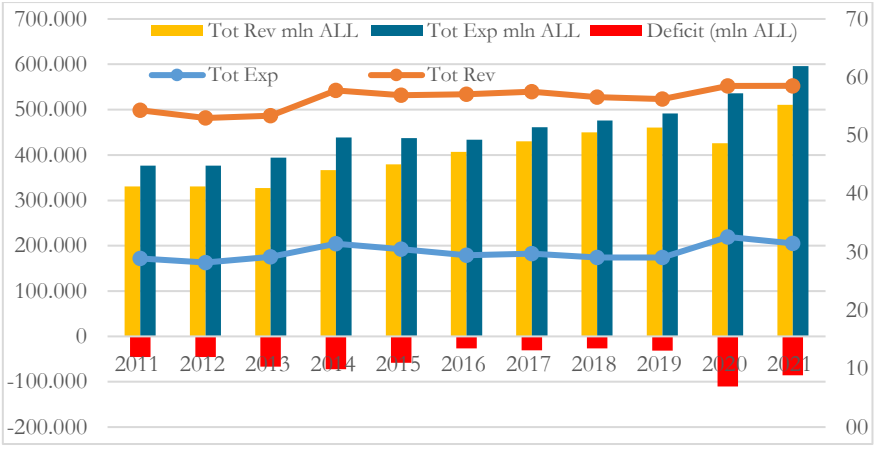

Figure 4: Public Revenue and Expenditure (in% of GDP)
Source: Albanian MoFE (2022)

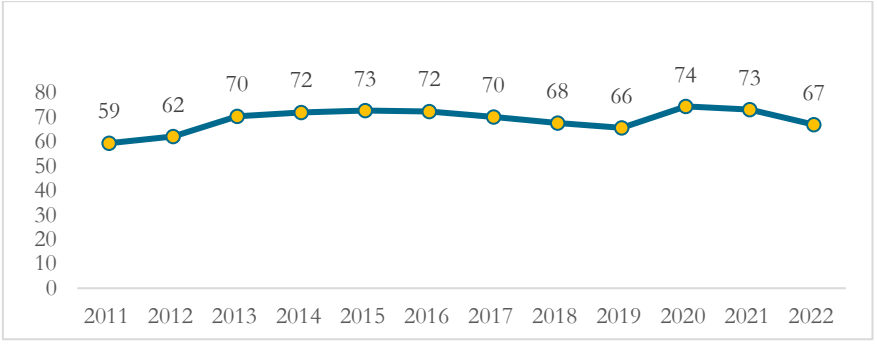

Figure 5: Public Debt (stock) % of GDP
Source: Albanian MoFE (2022)

As presented in Figure 4, public income does not exceed 30% of GDP, of which about 80% is collected from tax revenues, which are dominated by indirect taxes, namely 1/3 of the income is collected by Value added tax. If by 2013, public finances were based on resources such as privatization income, after this year the exhaustion of this source led to a higher attention of the government to mobilize internal future, though as seen from the graph above, weight Public income to GDP does not exhibit expected improvements, continues at about 27% of GDP, this is mainly explained by the complicated tax system in our country. On the other hand, in addition to the poor mobilization of income, there is also a budget of utilitarian functions, as about 60% of budget expenditures go for functions such as: social protection, education and health. While remains a very small portion of expenses to allocate to support priority sectors that will impact the business climate in the country. In summary, as reflected by the data above, Albania, as a developing country, is characterized by narrow fiscal spaces. The only instrument remains the debt for supporting public spending on the function of our spaces, which explains more than 10% increase in a decade, as illustrated in Figure 5.

4.2 Private financing

Albania is among the countries with low development of the financial system. As illustrated in Figure 6, its contribution to GDP has been below 3% over years and has marked a decreasing trend after 2017 from 2.9% of total economy value added to 2.5% in 2019 and 2.1% in 2020.

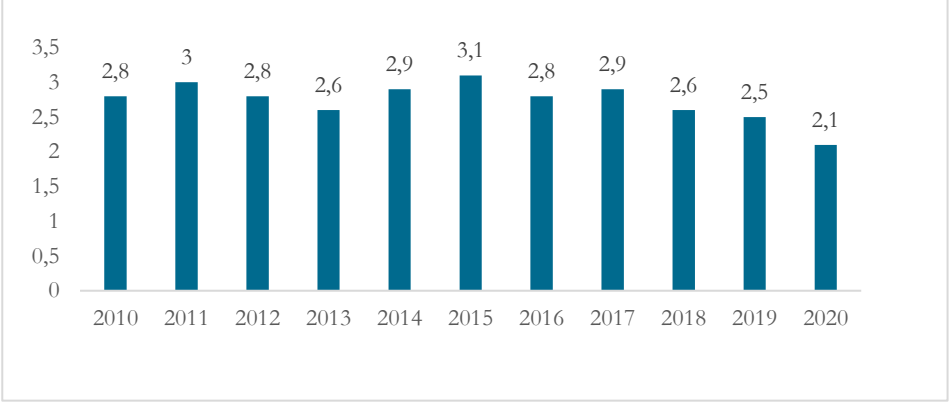

Figure 6: Contribution of financial sector % GDP
Source: INSTA and BoA (2022), author's calculation

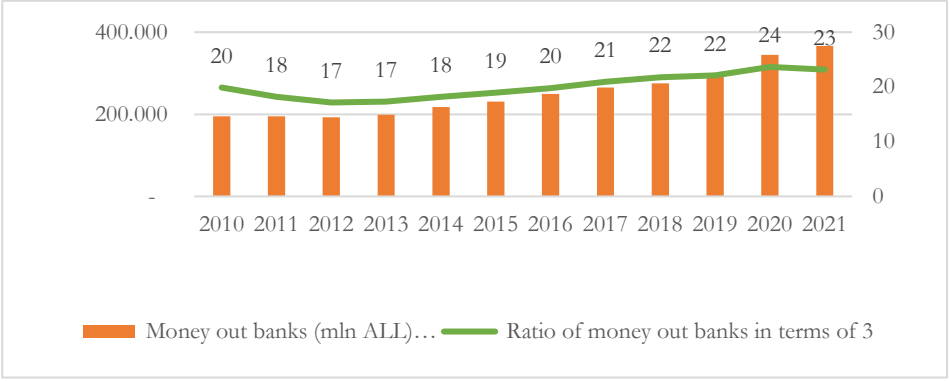

Figure 7: Ratio of Money outside Banks % of M3
Source: INSTA and BoA (2022), author's calculation

This low contribution of the financial sector in GDP, which remain less than 3% in 2021, is highly explained also by high weight of money outside depositary banks, which makes difficult to measure its effect on GDP. Considering, the ratio of money outside depository corporations with general money M3 it is observed that 30% of the money in Albania in 2021 results outside the banking system, an increasing trend after 2012 (21% in 2012), as shown in Figure 7. This demonstrates the presence of high financial resources for investment and support of economic developments.

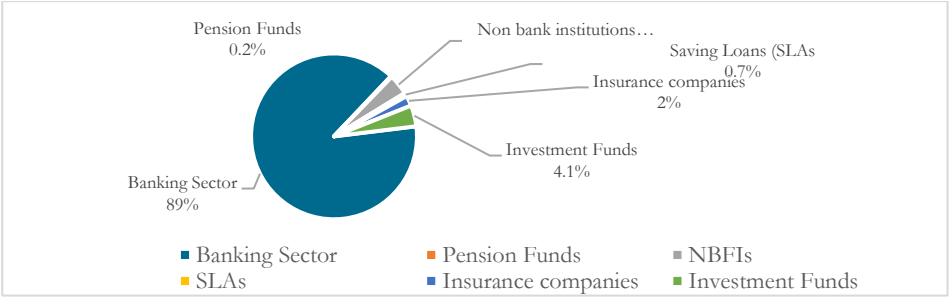

Figure 8: Share of financial system segments/ total assets of the financial system
Source: BoA (2022), Author's calculation

This shows that in a similar fashion to other developing countries, the banking sector in Albania has outpaced the growth of the equity and bond markets in the country. However, capital markets have a high potential to play in the long run a key role in the country's economy, in the long term. The financial market is dominated by

banks. Despite having several types of financial institutions, about 90% of assets are possessed by banks, 4.1% by Investment Funds, 4% by non-bank financial institutions, 2% by Insurance companies, and others. While the Albanian Capital market is at an initial stage of development in terms of size of the market as measured by market capitalization, the ratio of market capitalization to GDP, volume and value traded of financial instruments. There is no public issuance of securities other than government bonds and a limited (but increasing) volume of privately placed bonds. The banking sector is a primary lending source for the economy. Banks remain the main debt-holder in the country, more than 60% of the total burden of the sovereign debt is held by them. Total credit to the economy (2021) is around 5.4 billion EUR or 35% of GDP. Businesses are the economic agents which hold the higher share of credits in the economy, 63% of credits is received by businesses sector, individuals have received 33% of credit and the rest of 4% is held by public sector. The sector with the largest weight of lending in the economy is in Private non-financial corporations, accounting for about 50 percent or about 3.2 billion EUR, composed by Wholesale and retail trade sector (17 percent or 1.1 billion EUR) followed by "Construction" about 8 percent, "Manufacturing industry" by 7 percent, "Electricity, gas supply, steam" by 4 percent, "Accommodation and food service" by 4 percent, "Other service activities" by 2 percent, etc. The loan according to the sectors does not match the priority government sectors, because the electricity or tourism represent a minor weight of crediting, even being a governmental priority policy.

5 Discussion and Conclusion

Presence of major challenging SDGs invites us (and emerging countries) to reformulate the approach followed until today and look not only at how to increase financial flows, but also how to work out on how to reduce the cost of achieving the SDGs. For this purpose, it should be considered not only how public funds can de-risk private finance, but also look for other ways to reduce risk. Therefore, some steps are suggested to achieve the following two objectives:

- Development Finance Assessment (DFA), which is designed to support countries to build a more integrated, public and private approach to financing through an INFF.
- To assist the process of achieving the SDGs, the Integrated National Financing Framework (INFF) is offered as a tool to help map the landscape

for financing sustainable development and design a strategy to increase and use as effectively as possible the all types of finance for sustainable development. Albania is still in the early stages, it has just started the process supported by UN Program.

The complex agenda involving EU accession, infrastructure and SDG needs requires innovation in the SDG financing. Although there is no proper study for Albania on the amount of financial resources needed to fulfill the SDGs, international assessments determine that a developing country faces an average annual financial gap of 2.5 trillion dollars. It demonstrates that SDGs appear unattainable, and countries should rely not only on new strategies for SDG budgeting, but also on how to reduce SDG financing costs. Emerging and developing countries need to focus more on developing and mobilizing private funding as the main potential to finance existing gaps in their SDG investment needs, while public finances should focus on policies that improve business environment, rather than directly to finance SDGs, because as illustrated in case of Albania, most of the State Budget supports a few SDGs, while most of them relies on private funding. The private financial sector, besides being underdeveloped in Albania, demonstrates that lending according to sectors does not correspond to priority government sectors, showing a lack of reconciliation of public and private finances. Unprecedented shocks and risks violate the achievement of SDGS at a limited time as defined on Agenda 2030, so developing countries should follow a full and rigorous process, from determining financing needs (DFA), SDG budgeting, design of a financing strategy (INF), implementation and monitoring of the strategy, predicting in any step potential risks that may violate the continuity of the process. To succeed in implementation of Agenda 2030 need to establish a roadmap for the SDG, identifying roles and responsibilities of the key institutions and other stakeholders in the process, and include financial implications deriving from the national commitment to the SDGs and ensure further mainstreaming of implementation alongside the national policies and strategies, including monitoring and reporting mechanisms.

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INTERACTION MECHANISMS AND THE PERFORMANCE OF PRODUCTION ENTERPRISES AS SOCIAL SYSTEMS: THE TRUTH OF THE HUMAN SPIRIT

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Abstract This contribution goes beyond viewing a system as a black box receiving inputs and producing well defined outputs to an external environment. Its purpose is to explain the complementarity between first and second order cybernetics as well as of economic and sustainable performance. It discusses a black box using the notion of eigenform as developed by Heinz von Foerster (2003) wherein a performing object is understood changing overtime with apparent stability. It contemplates the concepts of structural and linguistic recursions and highlights the values of second-order and ontological cybernetics. The outputs of a black box are fed back to its inputs, possibly in real time, in order to manage its performance towards the often-economic requirements of the system's external environment, but showing signs of change and adaptation. The transformations the social systems perform are adaptive and change over time, making them non-trivial machines. Beyond producing technological transformations, the complexity of social systems emerges from the operational, moment-to-moment- interactions of its participants. Their outcomes are produced by changes in structure and ethical values, necessary for social sustainability and improved (policy) performance. These changes produce adjustments to the system's outcomes which are the observer driven mechanism of second-order cybernetics.

Keywords: organisational performance, sustainability, complexity, economics, second order and ontological cybernetics

JEL: E61, O11, O23

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1 Introduction

In this contribution I go beyond the usual view of a system as a black box receiving inputs and producing outputs to an external environment. In the context of an Enterprise Complexity Model the Viplan Method (Espejo, 2020), is offered as a means to explain the management of the complexity of a black box system. The outputs produced by this black box are fed back into the system's inputs, which if possible, are adjusted in real time to the requirements of the system's external environment (Beer, 1981). This is usually referred to as managing complexity from the perspective of first order cybernetics, and is understood as managing trivial machines (von Foerster, 2003), where inputs and their variations produce predictable output changes, which are absorbed by the market (M in Figure 1 below) of the black box through these feedback processes. However, it is apparent that black boxes are more than trivial machines and what happens within them is more that the mechanical transformation of inputs into outputs. Going beyond trivial machines is the focus of this contribution.

2 Literature Review

Actors within the black box produce more than transformations: that is, are far more than processes to transform inputs into elaborated products, which eventually interact with the market (M). The units producing these transformations within the BB, are far more than technological processes transforming inputs into finished products. They produce a wide range of changes among themselves as they modify each other and compute their mutual changes through different forms of adaptation. Indeed, they produce more than technological transformations or models between inputs and outputs; in fact, their network of interactions produces non-linear transformations in what Wene (2007) has referred to as *double closure* and are illustrated in Figure 1. As seen in this figure, beyond the input-output closure of components in social systems, which is a first form of closure, participants experience operational closure in their mutual interactions, which is a second form of closure (Espejo & Reyes 2011) through processes of structural recursions (Beer, 1979; Maturana 2002). The black box adapts through *computing relational* changes of participants in the system, which change its identity ('Z' in Figure 1) producing organisational changes, which go beyond the idea of trivial machines and offer the complementarity between the first order closure produced by the black box and its

second order operational closure (Espejo, 2021). They explain non-trivial machines, that is, explain the cybernetics of the observer (von Foerster 2003; Maturana 2002). This is second-order cybernetics. The outcomes of actors' interactions, as outcomes of closed network of operations in the black box, are observer dependent, following Kauffman (2003) discussion of eigenforms, wherein an object is seen to be a token for those forms that lend the object its apparent stability in a changing world.

Eigen behaviours are explained by Wene (2007; 2023) with the cybernetic closure theorem: "Operationally closed systems develop Eigenbehaviour". From this theorem it follows an important clarification for social systems. Beyond the input-output closure of trivial machines; social systems offer the double closure of participants interactions, affected by environmental changes, as they compute productions within the black box. These are situations of non-trivial machines, in which actors adjust their interactions as they modify each other following the need for stability in eigen forms. These are situations of double closure, which affect organisations of all sizes, from the very small to the very large, from those in need of local sustainability to those requiring global sustainability.

Scholte (2012), with a focus on the performing arts, relates creative interactions among actors and between them and audiences to the idea of eigen forms. Following the works of Kauffman (2005) and von Foerster (2003) he discusses the notion of eigenform. He uses eigenforms as the missing conceptual bridge to unite social constructivists with embodied cognitivists in the field of theatre studies and beyond in the cognate fields of film, literary and visual art theory, but also into more general social constructions. My comments to Scholte's paper in Constructivist Foundations (Scholte, 2012) were constructed as the outcome of actors' interactions with audiences in processes of double closure. Actors compute, as an outcome of transforming inputs into outputs to the environment (M), that is, as an outcome of producing stable outcomes or eigenforms, through which they carry out double closure in their interactions with collectives, their work of art. The argument is that the parts' interactions produce first order transformations of inputs into outputs, but also through computing these interactions produce second order outcomes or eigen forms. These two loops are related by self-reflecting loops (SRL) to evolving identities (Z) for the I-O transformations; that is to the *BB eigen-forms*. These eigen-forms may produce works of art, which are not objective representations of situations external to them. Actors and audiences experience stable meanings

through on-going processes of interactions, which make them changeable by an stable truth emerging from the participants interactions, that is, by the *"truth", of their emerging human spirit* (i.e. the object with their values, principles, and so forth). Scholte rejects the notion that "the collective actors", as they perform, provide to the related audiences with access to human truths (beyond their collective agreements or "truths"); for as long as they provide a genuine and rigorous grasp of a situation they are producing a "truth", which in general is not a proven scientific truth. Measurable performance does not necessarily drive these outcomes. The idea of measurable performance as the ratio between inputs and outputs, which is traditionally used as performance of commercially driven organisations, is now replaced by computations of self-reflective loops (SRL) produced by relations among the participants in these organisational systems, stretched by environmental avatars[1] triggered by ethical and value considerations, beyond commercial aspects; these are the eigen behaviours produced by double closure. Scholte's views that he relates to art can be extended to all kinds of systems; commercial and social.

3 Methodology

The interactions among the actors, and more generally of the participants producing the meanings of a situation, whoever they happen to be, through shared computing processes, possibly through shared models, experience meaning creation beyond the actors creating and inventing them. I'm offering, from an organisational perspective, an interpretation of capturing the *"truth" of the human spirit* from people's interactions. As already said, the outcome is not an objective truth, or productivity of inputs versus outputs, which may be of value for commercial purposes, but expressions of collective values, ethical considerations and more general constructions.

As already said, in Figure 1 a *self-reflective loop* (SRL) is computing processes and modifying the *identity Z* of the internal closure of interactions, producing social situations such as the UNO 17 goals (e.g, climate change, education, use of natural resources, works of art, and so forth relevant to an extended understanding of organisational systems). Furthermore, audiences and actors, beyond interpersonal interactions, interact in *contexts*, such as culture, nature, climate, which are

[1] From the English Dictionary we understand that an Avatar is the embodiment or manifestation of a person or idea; and also, it is an icon or figure that represents a particular person in an internet forum.

fundamental to understand the balancing of their interactions. It is in these spaces that the performance of interactions takes place and the question is, are these contexts contributing to produce valuable second-order experiences or are just good economic outcomes as we usually construe input-output relations?

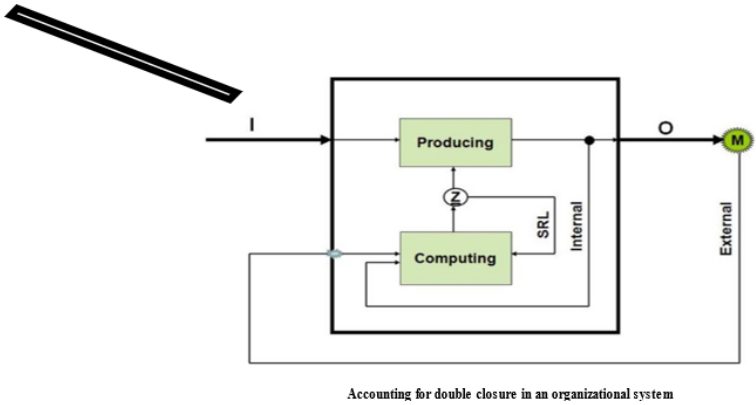

Figure 1: Second Order Organizational Systems and Active Contextual Environments The (Meta) Context of Interactions
Source: Wene (2007).

Beyond subject-subject environmental interactions, which belong to the organization-environment space of structural formations, this work is recognizing a subject-metasubject space of interactions which belongs to the cultural formation of these organisations, in contexts of religious, ethical, climate contexts and others, which constraint the way the organizational systems operates in those contexts; this is something that goes beyond the organisation-environment interaction into their *organization- meta environment space*; this is a sort of contextual closure as is explained in Figure 2.

From the perspective of variety management closure (Ashby, 1964) the input-output loop makes apparent that the output of transformational processes can be related to a desirable performance; what output is produced by what input? From the perspective of producing something, this is fundamentally a quantitative loop. If the purpose is producing something at a given level of performance the law of requisite variety tells us whether the resources available are adequate or not for this purpose

and whether the feedback loops are *correcting* relationships between actors and audiences to achieve this desirable performance. All these are *mutual variety correcting* processes between actors and audiences, in which the high variety experienced by the latter, in their contexts (what we called avatars) need to be absorbed, one way or another, by the actors' varieties in search for desirable (input-output) performance. But beyond economic performance, if their purpose is respect for participants, valuable artistic experiences of all participants or, in a more general sense, spiritual satisfaction, their interactions may contribute through the closure of their learning loops to *ontologically acceptable eigenforms* (Espejo & Lepskiy, 2022). Participants contribute with their creativity, inventiveness, values, histories to the formation of eigenforms, or stable meanings through their interactions.

4 Results

All this is highly complex. It is possible that actors to produce desirable outcomes, may recognise different views for their input-output transformations (first loop) and through their *interactions* with environmental participants trigger different understandings of these transformations and open the space for adaptation and change, that is, trigger different forms of double closure (second loop). These are non-trivial learning loops related to the black box, which create different appreciations of the contributions of different actors and trigger *computing* processes among the participants themselves and also with their medium or immediate environment.

From a complexity perspective both actors and audiences experience high varieties. However, an additional aspect is illustrated by the external loop in Figure 2; these interactions take place in a wider context, a metacontext, that shapes the complexities that they experience. As already clarified eigen behaviours lend stability to objects in a changing world. Actors creative contribution to organisation-environment interactions can be understood as extensions of Beer's Viable System Model with double-closure (Espejo, 2020) offering adaptive products and through their multiple relationships offering aspects of ethics, values, environmental responsibilities and what they may require in the spirit of a piece of work or social construction. Therefore, what happens through the black box, the transformation it produces, is more than products; it is the outcome of double closure, through linear and non-linear transformations. This epistemology is explained in Espejo (2020) as

the complementarity of a black box and an operational description of a social situation.

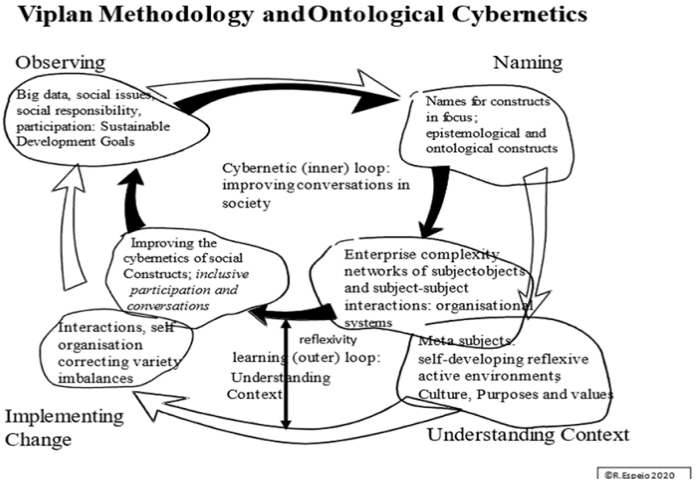

Figure 2: Viplan Methodology and Ontological Cybernetics
Source: Espejo (2020)

5 Discussion

In today's world of highly complex, digital technology, what is of significance to the above elaborated system-environment interaction criteria? In today's world, how does it relate to artificial intelligence (AI), that is, to the output of an Image Dream Generator? How does AI relate to double closure? For instance, can it produce top notch artwork? Or high-quality art is beyond an AI producer? How does it blur ethical boundaries as it is the case with human work? Human artists mix emotion and nuance in their personal styles. Is there a need for regulation in the production of AI art? AI-generated content has the potential to create new forms of art, but the complexity of works of art goes beyond computing through selections in a database. At the very least new products in situations of double closure go beyond input-output transformations.

As an expression of the human spirit, with a focus on art, artists create, regulate and implement their works, as they interact among themselves and with other subjects in their wider environments, at the same time that they are constrained by meta-

systems that culturally are shaping their spaces for action and development. These are the actors–metasubject relationships, which are relevant to all forms of social systems, that is, they apply to interactions between organisations and their environment and between them and with their contexts.

Whether the dominant epistemologies of people in social contexts are those of first- or second-order cybernetics, social responsibility in ontological cybernetics is considered in the context of the subject/meta-subject paradigm, that is in the context of self-developing reflexive-active environments, which vary in degrees of reflexivity and required regulation (Lepskiy, 2018).

While the meaning of interactions between social and environmental subjects is about the development, adaptation and implementation of their tasks, the meaning of belonging to a larger meta-systemic context is about social responsibility in self-developing reflexive-active environments (within social constrains of citizenship relationships).

These ideas are proposed under the influence of philosophical transdisciplinary, aimed at bridging social constructivists and embodied cognitivists, making possible to integrate ideas and concepts of humanitarian studies: ideas of society as social systems activity (Lepskiy 2018) and subject-activity approaches, interdisciplinary ideas of the formation of social cybernetics (Beer, 1975; 1979), socio humanitarian analysis of the experience of developing automated systems (Lepskiy, 2018; Luhmann, 1995) and others.

Self-developing reflexive active environments are increasing our understanding of organizations beyond their immediate system-environment definition. Sustainable issues are better structured and managed if relevant subject-metasubject self-developing reflexive-active environments are entangled with actors and agents in learning conversations.

Subject-subject interactions are shaped by multiple viewpoints which observe situations from their own perspectives; these are the foci of second order cybernetics. In particular these are interactions of agents in general, in which actors are stretched changing the organization's structure, triggering a variety of organizational forms (inner loop in Figure 2). However, these interactions happen

in a context of self-developing reflexive active environments (outer loop in Figure 2). This reflexivity, as presented in Figure 2, is between the organizational system improving its structure in the cybernetic (inner) loop of its operational environment and the (outer) loop of reflexive active metasubjects correcting variety imbalances to improve the organizational context. This is a contextual environmental learning. It is about correcting responses to the wider organizational environment; it is about meanings, values, concerns, emotions dominating recursively its organization and its autonomously contained primary activities; it is about global, regional and local citizenship. These contexts restrict their spaces of interactions. They are restricting the subject-subject interactions of the organizational system with its immediate environment, with the complexity of their wider environmental agents, which belong to the organization-environment space of structural formation. For its part the subject-metasubject interactions belong to a cultural formation, including religion, ethnic differentiation, fundamental societal values, and others which constraint the way the organizational systems operates in that context. From an ontological perspective we are talking of two types of cybernetic models: the first is the Viable System Model (Beer, 1979) expanded by the Enterprise Complexity Model and the Viplan Methodology (Espejo, 2020), and the second is a model of self-developing reflexive-active environments, as proposed by Espejo and Lepskiy (2020; 2022) with the name of ontological cybernetic.

6 Conclusion

Self-developing reflexive active environments as illustrated in the above loops, are increasing our understanding of organizational systems beyond formal or legal definitions. Sustainable issues are better structured and managed if relevant subject-metasubject self-developing reflexive-active environments are entangled with actors and agents in learning conversations. This entanglement is illustrated in Figure 2 to introduce a preliminary understanding of the "truth" of the human spirit.

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INDUSTRY 5.0: GUIDELINES TO DIGITAL TRANSFORMATION AS A STRATEGY FOR SUSTAINABILITY

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Abstract Digital transformation involves the integration of digital technologies and solutions into every facet of an organization. However, it's not just about technology, but also requires a cultural shift within the organization. It's a crucial component for any comprehensive business transformation strategy and can be the key to success. By leveraging the right technologies and involving people, processes, and operations, organizations can adapt quickly to change, seize opportunities, meet customer demands, and drive growth and innovation. To ensure long-term sustainability, it's essential to integrate sustainability strategies across various dimensions of the digital transformation roadmap. This paper explores how digital transformation has evolved since the COVID-19 pandemic, the significant challenges that organizations are facing today, what leading organizations are doing differently, and what steps can be taken to identify and address the key areas of focus in the coming years, with an emphasis on the people component as a critical success factor.

Keywords:
Industry 5.0, digital transformation, sustainability, strategy, organizations

JEL:
L26, M14

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1 Introduction

In the digital transformation, organizations are facing a multitude of changes. Industries, markets, and customer demands are developing with great dynamism, and not just since the pandemic gave us a digitalization boost. Organizations need to respond to digitization and shape this change to remain fit for the future and to address sustainability topics. When organizations undergo organizational change, this also offers opportunities for sustainable business. Digitization and sustainability are driving themes of our time and, when considered together, can create social, ecological, and economic benefits. Not enough organizations focus on the transformation of the human success factor in digital transformation. Transformation has always been about people. This has often been a weak point for many digital transformation efforts and is the component that many organizations are missing.

2 Literature Review

2.1 Digitization

Digitization involves the integration of digital technologies into business processes to enhance their effectiveness. This transformational process often changes the way organizations interact with stakeholders and even their revenue streams. Fundamentally, digitization involves the mechanical translation of physical data into a digital format. Digital information consists of ones and zeros and cannot be distorted, and its transmission occurs without losses. In recent years, digitization has increasingly been understood as a collective term for the use of digital information in business, politics, and society. Digitization enables processes in all these areas to be modernized and improved. Digital transformation is a direct consequence of digitization (Ordieres-Meré et al., 2020; Ananyin et al., 2018).

2.2 Digital transformation

Digital transformation is the transformation of the corporate world through new Internet technologies with effects on society. Digital information and communication technologies are used to improve performance by transforming or enhancing corporate processes, customer experiences and business models (El Hilali

& El Manouar, 2019). The concept of digitization can be used in and affect many different areas. A common application of digitization is the upgrade of a business model, where the goal is to achieve added value through the introduction of new technologies. The introduction of digital technologies can improve industrial processes (Ghobakhloo, 2020; Ananyin et al., 2018).

2.3 Digitization in organizations

Organizations are currently taking a reactive approach to digital transformation, with many using new technologies to remain competitive and relevant, rather than looking to innovate (Erkollar & Oberer, 2023; Craig, 2021). However, when done correctly, digitization can bring significant benefits to organizations, such as improved working conditions, new customer acquisition channels, better decision-making, higher employee retention, improved teamwork, and a greater willingness to innovate. Digitization offers primary benefits in the form of better workflows, greater efficiency, improved products, and new services, leading to secondary benefits such as improved competitiveness, reduced response times to customer feedback, and shorter time to market for new products (Ghobakhloo, 2020). Additionally, end-to-end integration of entire supply chains can lead to cost reductions in production. Despite the benefits for customers, digitization may not always provide immediate value to the organization (Craig, 2021; Ghobakhloo, 2020; Teece & Linden, 2018). However, digital transformation, sustainability, and strategy are interconnected concepts that are crucial for organizations to succeed in today's fast-paced and ever-changing world. Digital transformation involves the integration of digital technology into all areas of a business, leading to fundamental changes in how the business operates and delivers value to customers. The increasing prevalence of digital technologies such as cloud computing, artificial intelligence, and the internet of things are driving this transformation, revolutionizing the way businesses operate and interact with customers (Erkollar & Oberer, 2023; Craig, 2021; Teece & Linden, 2018).

At the same time, sustainability has become a critical issue for businesses and society as a whole, as concerns about climate change, resource depletion, and social inequality have increased. Sustainable business practices involve balancing economic, environmental, and social considerations to create long-term value for all stakeholders. Strategic thinking is also essential for businesses to succeed in today's

highly competitive environment. A strategic approach involves setting goals and objectives, making decisions, and allocating resources in a way that aligns with the organization's overall mission and vision. Together, these concepts form a powerful framework for businesses to navigate the challenges and opportunities of the digital age. Digital transformation provides the tools and technology to enable sustainable business practices, while strategic thinking ensures that those practices are aligned with the organization's overall objectives (Craig, 2021; Manrique et al., 2021; Teece & Linden, 2018).

Further, a 'the-winner-takes-it-all economy' that encourages the creation of monopolies. Challenges for most organizations include the complexity of implementing a new technology, the lack of resources in terms of skilled IT staff, the general reliance of the workforce on proven technologies, and the question of why change something if it does work. Other challenges that can stand in the way of digital transformation include upgrading the workforce to cope with digitization, introducing new business models, increasing focus on environmental and social sustainability, transitioning to a digital enterprise, and adapting to the realities of a digitized economy. This is expressed through decentralized collaboration, and the merging of digital and physical information (Craig, 2021; El Hilali & El Manouar, 2019; Ananyin et al., 2018).

3 Methodology

A deductive, qualitative research approach with a descriptive research design is applied. The primary research method used is that of document analysis. The research question for this publication is explorative: 'What are the key success factors of a digital transformation in a post-pandemic environment?' A document analysis is conducted on the topics of digitization, digital transformation, and sustainable development. Based on this, approaches for a successful post-pandemic digital transformation are analyzed.

4 Results

4.1 Digital transformation – a post-pandemic view

The COVID-19 pandemic has acted as a trigger for digital transformation in many organizations, driving them to accelerate their technology initiatives, make drastic changes to processes, and re-evaluate their culture's role in today's business world. However, many organizations are still facing significant challenges in their digital transformation efforts, and addressing these challenges should be a top priority for organizations in 2023 and beyond. The integration of technology, streamlining of processes, and delivery of increased business value remain top priorities as organizations look to the future. Key investments in digital transformation include business process automation, artificial intelligence, and machine learning. For many organizations, 2021 was a year dominated by digital transformation as they evaluated the impact of their investments and refined their strategies. Successful digital transformation requires organizations to move beyond survival mode and embrace change (El Hilali et al., 2020; El Hilali & El Manouar, 2019; McConnell, 2015).

4.2 New success factors and priorities

As organizations seek to adapt to new business models and achieve their goals, they are also changing their digital transformation objectives. These goals include optimizing their data strategies, innovating, and enhancing the customer experience beyond pandemic-related adjustments (Felsberger & Reiner, 2020). However, achieving these objectives can be challenging and may compromise organizational success if not addressed properly (Junge, 2019; Kayikci, 2019). Staffing challenges are a significant impediment to digital transformation, as organizations face difficulty finding and hiring talent to support new initiatives and in creating a culture of continuous learning. Failing to address these issues can not only jeopardize the organization's ability to support new technologies but also compromise its competitive advantage in the long run. Organizations must also align their digital transformation efforts with business goals and key performance indicators, which are critical to the success of the transformation. Digital transformation requires more than just developing new applications, and it is essential to integrate it into existing processes and adapt business processes. Retraining employees on new activities is necessary (Felsberger & Reiner, 2020; El Hilali & El Manouar, 2019).

4.3 Why some are more successful than others

Successful digital transformation in organizations is characterized by leaders who communicate a clear vision of the transformation, and inspire employees to embrace change to foster a culture of transformation (El Hilali et al., 2020). To achieve this, leaders need to empower employees at all levels and reward them for taking initiative in becoming agents of change. Organizations need to create a culture that accepts failure and encourages taking risks to drive digital transformation (Junge, 2019). However, building such a culture can be challenging in organizations where success is defined by not making mistakes.

The COVID-19 pandemic led to unprecedented labor shortages, forcing organizations to re-evaluate their talent needs and face the challenge of effectively allocating resources to the right areas of transformation (Ghobakhloo, 2020; El Hilali & El Manouar, 2019). Many organizations struggle to find and retain talent to support their new technologies and business initiatives. To address this challenge, organizations could prioritize upskilling and training their existing employees, which is an often-untapped opportunity (Alenezi, 2021). However, organizations may hesitate to invest in training because they assume that employees will leave the organization at some point (Dias et al., 2022).

In summary, successful digital transformation requires clear communication from leaders, a culture that embraces change and risk-taking, and effective allocation of resources, including talent. Organizations can leverage internal talent by prioritizing their upskilling and training, leading to a more sustainable approach to meeting their talent needs.y assume they will simply leave the organization at some point (Dias et al., 2022).

5 Discussion and Conclusion

5.1 Measuring the success of digital transformation

Many organizations struggle with aligning their business goals and key performance indicators (KPIs) with their digital transformation initiatives. However, leading organizations prioritize aligning their digital transformation efforts with their business objectives and KPIs to achieve their goals (Lixu, 2022). They make it clear

that their digital transformation initiatives are meant to achieve specific objectives and goals.

While organizations may focus on operational efficiency as a metric to measure the success of their digital transformation efforts, it may not be the most effective measure. Operational efficiency is more about digital refresh than digital transformation, as organizations replace outdated legacy processes with new digital ways of working. Instead, organizations should avoid relying solely on process-oriented benchmarks to measure the progress of their digital transformation efforts. Employee satisfaction is a crucial yet undervalued metric that organizations should use to measure the success of digital transformation initiatives. This is because engaged employees are more likely to adopt new technologies, leading to successful digital transformation (Katsamakas, 2022).

5.2 The priority is still on technologies

Organizations have been driven to invest in business process automation due to labor shortages resulting from the COVID-19 pandemic (Ghobakhloo, 2020; El Hilali & El Manouar, 2019). As a result, artificial intelligence (AI) and machine learning are becoming high-profile technology investments once again, as organizations seek to better interpret data and make more informed decisions, as well as engage with customers more effectively using analytics (Lixu, 2022; Katsamakas, 2022). While technological advances have contributed to changes in markets, organizations must also address ecological and social sustainability deficits, and integrate core competencies into new business models and market areas in alignment with corporate sustainability strategies (Dias et al., 2022; Junge, 2019). Therefore, meaningful digitization of processes is necessary to leverage opportunities and overcome challenges in the current business landscape.

5.3 What comes next?

Many organizations were quick to jump on the digital transformation bandwagon without a clear understanding of their goals. To ensure successful investments in new technologies, organizations must prioritize productivity, good employee experience, and good customer experience. Digital transformation has become increasingly crucial for businesses, as it enables them to break free from constrained

business activities and shift their focus to delivering more business value. To achieve greater success in their transformation efforts, organizations must address the key cultural challenges that hinder their progress. In the area of human resource management, hiring strategies need to be re-evaluated, and retraining and upskilling programs must be supported to ensure that corporate transformation efforts align with business goals and KPIs. Sustainability, digital transformation, and strategy are interdependent and should be approached strategically to ensure long-term business success. By adopting a strategic approach to sustainability and digital transformation, businesses can identify new opportunities and markets, develop innovative products and services, reduce their environmental impact, and create long-term value for all stakeholders (Katsamakas, 2022).

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SUSTAINABLE HUMAN RESOURCE MANAGEMENT

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Abstract Sustainable HRM (SHRM) is a new approach to people management, focusing on long-term HRM, regeneration, and renewal. It helps firms attract and retain high-quality employees: by integrating SHRM practices into their employee value proposition, firms establish unique, attractive employer brands. Socially Responsible HRM, Green HRM, Triple Bottom Line HRM, and Common Good HRM are types of SHRM. Especially these characteristics of SHRM matter: Long-term orientation, care for employees, environment, profitability, employee participation and social dialogue, employee development, external partnership, flexibility, compliance beyond labor regulations, employee cooperation, fairness, equality. SHRM is based on sustainable HR policies, such as management of employment relationships, prevention, health and safety at work, training and continuous development, diversity and equal opportunities, fair remuneration and social benefits, communication, transparency, social dialogue, attraction, and retention of employees, work–family balance. The paper presents a possible requisitely holistic model of SHRM.

Keywords:
sustainability,
sustainable human resource management (SHRM),
types of SHRM,
characteristics of SHRM,
social responsibility

JEL:
Q01, Q10, A13

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1 Introduction

Since firms are dealing with the external pressure of society, obstacles in the labor market, and internal issues in employment relations, they must reconsider their responsibility and business models. Shortage of skilled labor force, aging society, and employee health problems are examples that impel firms to search for new ways to improve their HRM (Clarke, 2011). Therefore, using the potential of sustainability for HRM, which includes providing a proper work environment and conditions, providing development opportunities, being genuine towards employees, and being attentive to employees' psychological and physical well-being, could make sense (Wikhamn, 2019).

HRM is now expected to actively help organizations meet the demands of competing stakeholders, take care of the triple bottom line, and achieve financial, social, and environmental performance for both the present and the future; thus, sustainability is increasingly significant for HRM, too (Ehnert et al., 2014).

The United Nations Brundtland Report introduced 'sustainable development (SD),' defining it as development that meets the present needs while preserving future generations' ability to meet their own needs (Brundtland, 1987). The SD perspective promoted various concepts regarding business responsibilities, including corporate social performance (CSP) and corporate social responsibility (CSR). CSR exposed ethical and philanthropic obligations in addition to organizational financial and legal responsibilities (Ehnert & Harry, 2012).

To authors of this paper, SHRM addresses modern macro and micro challenges. The demand for sustainability and sustainable development is increasingly gaining ground globally, including SHRM to ensure a long-term relationship with HRM stakeholders. To add insight into SHRM, we use available secondary scientific sources with a qualitative approach.

We present research on SHRM, its characteristics, and types to help managers and companies implement SHRM. Hence, we derived a possible requisitely holistic model of SHRM. The paper is structured in 3 sections. After the introduction, section 2 describes the scope and characteristics of SHRM. Section 3 sets the discussion and conclusions.

2 Theoretical Background

2.1 The scope of SHRM

SHRM is an extension of strategic HRM (Ehnert, 2009), defined as the set of planned or developing HRM strategies and practices designed to support the achievement of economic, social, and environmental goals while sustaining the HR base over time (Kramar, 2014). Ehnert et al. (2014) see SHRM as a contribution to sustainable company development: sustainability reaches beyond environmental and economic sustainability to involve other issues, including justice, employee participation, health and wellbeing, employability, and employee development.

The SHRM characteristics explain what HRM should look like to be sustainable and how sustainability can be used for HRM. They were suggested to improve knowledge on how to make SHRM more explicit (Stankevičiūtė & Savanevičienė, 2018). The following ones matter most:

Long-term orientation prioritizes long-range consequences and impacts of decisions and actions; they matter after a long period (Lumpkin & Brigham, 2011). This includes: futurity, which indicates a worry about the future; continuity, which emphasizes the link between the past and the future; and perseverance, which stresses the effect of current choices on the future (Lumpkin & Brigham, 2011). Unfortunately, in many important decisions, the optimal long-run plan of action is not the most desirable in the short term (Laverty, 1996).

Care about employees, their workload, income, work-life balance, and other factors (Guerci & Pedrini, 2014) including workforce remaining healthy and productive over the long term (Ehnert, 2009).

Care about the environment is a critical aspect of green HRM (Renwick et al., 2008) and the ecological result of SHRM (Kramar, 2014). HRM should heavily emphasize environmental responsibility, focusing on recruiting environmentally conscious and highly qualified employees, particularly younger generations (Renwick et al., 2008). Strategies for environmentally responsible recruitment include using technology, responsible branding, choosing candidates with environmental awareness, and including environmental factors in recruitment messages (Opatha & Arulrajah, 2014). More broadly, environmentally responsible behavior in day-to-day

tasks might include rational electricity use, limited printing, switching paper-based tasks to digital platforms, garbage sorting, and eco-friendly transportation (Kramar, 2014).

Profitability has, for a very long time, dominated organizational activity. Now, financial measures are no longer the sole way to evaluate success as businesses increasingly commit to sustainability (Kiron et al., 2011). The sustainability factor does not invalidate economic success (Stankevičiūtė & Savanevičienė, 2018). An organization's long-term viability depends on both: its financial stability and environmental competitiveness (Clarke, 2011).

Employee participation and social dialogue: a way to increase employees' commitment and loyalty toward the organization and fulfill social needs and human growth (Joensson, 2008). It is also a fundamental goal of SHRM: it enables perceiving employees as subjects (Zaugg, 2009).

Employee development is linked to long-term orientation, considering employees as key assets and change agents (Hirsig et al., 2014); future-oriented skills reach beyond improving the current ones. Investing in future skills challenges viewing corporate sustainability as a whole because the business environment is constantly changing and calling for urgent efforts to respond, including in terms of employee abilities (Stankevičiūtė & Savanevičienė, 2018).

Flexibility: functional and numerical flexibility are two types of flexibility in HRM. Functional flexibility is the capacity to adjust to changing company's needs for versatile, internally mobile people and depends on long-term mutual investment in employment relationships, while numerical flexibility involves adjusting personnel numbers to match business demands and minimize costs (Carvalho & Cabral-Cardoso, 2008). While numerical flexibility is often associated with short-term cost-cutting, it can be sustainable if it involves temporary employment of individuals who need assistance in integrating into the labor market (Stankevičiūtė & Savanevičienė, 2018). Flexibility in SHRM mainly pertains to employee demands such as work hours, leave, retirements, vacations, rewards, and remote work (Vihari & Rao, 2018).

Compliance beyond labor regulations: one must match the law to operate (Stankevičiūtė & Savanevičienė, 2018), but it's not enough sufficient for effective SHRM. A more comprehensive strategy is required for SHRM and profit from it, as adherence to institutional standards alone does not guarantee sustainability (Järlström et al., 2018).

Employee cooperation is created and improved by sharing information, building trust and respect within the organization, and using open, proactive communication. It also promotes increased quality and productivity, lowers absenteeism and the likelihood of labor conflicts, it boosts overall job satisfaction (Hirsig et al., 2014).

Fairness and equality: rules, rights, and responsibilities must be the same for everyone in the organization (Järlström et al., 2018). To ensure SHRM, diversity promotion in necessary and fairness and equality should reflect in all aspects of HRM, including hiring, reviewing performance, awarding employees, etc. (Hirsig et al., 2014).

External partnership: relationships with the labor market, educational institutions, non-governmental organizations, and employee families are considered contributing value. Therefore, in SHRM, a company must recruit and keep employees today and maintain access to the so-called "source of resources"(Ehnert, 2014; Ehnert, 2009).

2.2 SHRM types

To achieve effective design and implementation of SHRM and contribute to solving today's grand sustainability challenges, it is crucial to identify different SHRM types and their purposes (Ehnert et al., 2020).

Socially responsible HRM (SRHRM) includes HRM techniques that target implementing employee policies and promoting the implementation of CSR policies while influencing the conduct and attitudes of employees (Zhao et al., 2021). To help the organization achieve its CSR goals, SRHRM seeks and keeps employees with a strong sense of CSR that favor organizational morality and are eager to participate in ethical activities like protecting the environment and charity (Abdelmotaleb & Saha, 2019).

SRHRM encourages employees' moral behavior more than other HRM strategies. SRHRM inspires employees to defend the interests of other stakeholders and urges them to perform initiative behaviors (Zhao et al., 2021). Employees' CSR awareness will prompt them to act morally to protect the organization's and external stakeholders' interests when they witness unethical activity in the workplace. On the other hand, SRHRM considers social performance in evaluation and promotion, embedding ethics within the organizational structure (Abdelmotaleb & Saha, 2019).

Green HRM refers to organizational creation, implementation, and ongoing maintenance processes for environmental consciousness. Green HRM makes employees environment-friendly to meet organizational environmental goals and substantially contributes to environmental sustainability. Benefits for individuals, society, the environment, and the company result from policies, procedures, and processes making all green (Opatha & Arulrajah, 2014).

The role of GHRM is typically seen as either supporting environmental management (EM) by influencing the environment or focusing on organizational culture towards EM targets, or it is seen as primarily manifesting itself in HRM practices, e.g., to reduce carbon footprints by printing less, traveling less, or adopting other environmentally conscious behaviors (Järlström et al., 2018).

Triple Bottom HRM concentrates on the HRM's presumed economic, environmental, and social goals all at once (Ehnert et al., 2020). This method demonstrates that a more comprehensive understanding of sustainable human resource management is possible when HRM is viewed as a general approach to people management that concentrates on employee-oriented practices (like employee well-being or involvement) while also taking into account the impact of HRM on its social and ecological environments (such as resource regeneration, and/or ecological goals) (Ehnert, 2009).

Common Good HRM is a fundamental shift in how humans view the purpose of business and HRM's contributions. All aforementioned HRM types partly modified the traditional business objective - financial gain - to adapt to external pressure for greater social and ecological responsibility. A common good HRM posits that business has a fundamental duty to contribute meaningfully to sustainability issues. Its long-term self-interest lies in preserving our way of life (Ehnert, 2009).

3 Discussion and Conclusions

The SHRM may be the most complex challenge ever attempted in HRM (Westerman et al., 2020). Its HRM techniques and practices enable attaining financial, social, and ecological goals, with influences inside and outside the business and over a long period while preventing unwanted side-effects and feedback (Ehnert et al., 2016).

As a very complex topic, SHRM covers multiple types per their target areas. Along with economic aspects, SRHRM focuses on the company's effect on society, GHRM on its environmental impact, and Triple Bottom HRM combines all three aspects. These three types of SHRM share the consideration of how implementing sustainability can help the company achieve higher financial success. On the other hand, Common Good HRM defines sustainability as a necessary property of HRM to preserve our life. It is recommended for businesses to implement SHRM practices in their operations to ensure their long-term survival. Such practices can be implemented into employees' recruitment, selection, training, rewarding, etc. By matching SHRM, businesses can make themselves more appealing to environmentally conscious potential employees. Therefore, managers should use all types of SHRM and define the extent of effort they would be willing to put into implementing them.

Since the implementation of SHRM practices would require substantial financial inputs (employee and management training, as well as a change in a business organization), there are practical limitations on how many businesses will decide to implement such practices and the extent of effort they would be willing to put into implementing them.

The main purpose of this paper was to determine whether SHRM is the answer to modern macro and micro challenges. Yes, it is. Namely, implementing sustainability into HRM will benefit the business in the long run, employees, and society as a whole.

By examining the research reported in this paper, we can derive a holistic model of SHRM. In the center of the model in Figure 1, we can see the characteristics of SHRM, beneath are its functions, and on the side are the connections between different SHRM types.

The main outcome of this research is a requisitely holistic model of SHRM. As such, it could be useful for companies in their effort to implement sustainability into their HRM practices. Therefore, this paper offers the next logical research step, i.e., to test our model in practice and make suggestions for upgrading it.

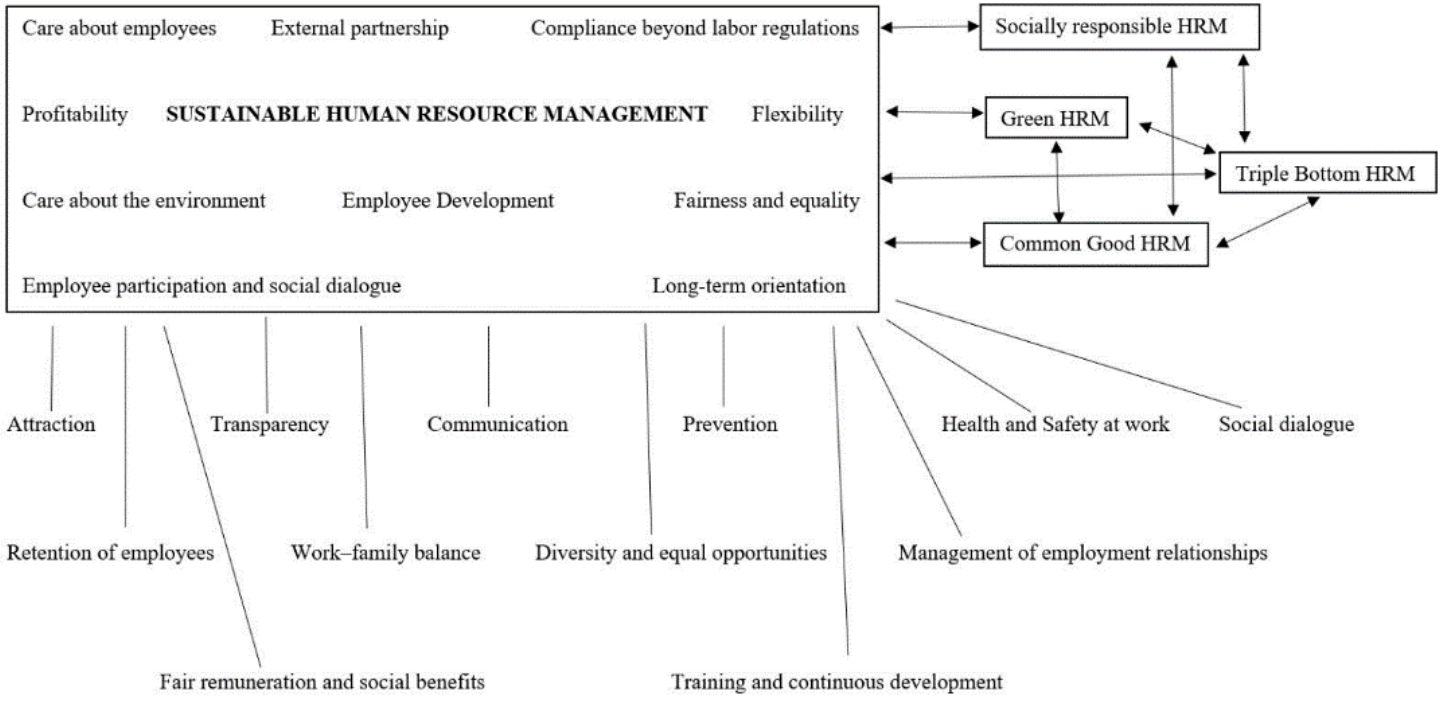

Figure 1: Characteristics of SHRM

Source: Auhthor's elaboration.

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CHANGE IN DEVELOPMENT VECTORS OF UKRAINIAN ENTERPRISES IN WAR CONDITIONS

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Abstract The war has changed the lives of Ukrainians dramatically. High turbulence of the economic environment cause searching potential directions of business activity recovery for Ukrainian companies. The purpose of the study was to identify the current development issues and summarize the experience of survival of Ukrainian enterprises under war conditions. Based on the analysis of the responses of more than 500 Ukrainian enterprises' representatives from all regions of the country, actual functioning problems of Ukrainian business after February 24, 2022 were revealed. Dynamics of economic results of the enterprises was analyzed, structural changes of their contract portfolios were determined, practice of full or partial relocation of business was revealed, current operating issues of domestic companies were described. Potential vectors of development are changes in the company's product portfolio, logistics chains, structure of the contracts, keeping decent work conditions and social support for the employees.

Keywords: economy, management, enterprise, development, business

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1 Introduction

As a result of external aggression, business in Ukraine was forced to develop and implement anti-crisis strategies urgently within a significant deterioration of the general state of the economy. According to the Ministry of Economy of Ukraine, by the end of 2022, the drop in GDP is estimated to reach 30,4 % (Ukrinform, 2022). All areas of the economy have experienced a significant negative impact on business associated with the threat of physical loss of assets, power generation shortages and disruptions of supply chains due to hostilities and port blockades.

In order to ensure the effectiveness of financial support for the development of domestic SMEs, new relevance is vested in determining the vectors of their development, taking into account the current conditions and prospects of European integration.

The necessity of forecasting the development of the enterprise increases within a crisis state of the economic system as a whole. This need is especially acute during systemic crises such as full-scale hostilities. Since February 2022, foreign and Ukrainian researchers have made numerous attempts to determine the conceptual basis for forecasting the development of enterprises during the war and in post-war period and offer effective management tools for predicting the future.

A review of scientific publications of the last year allows us to highlight the key thematic areas of such research, in particular:

- Identification and generalization of the consequences of full-scale military aggression by the russian federation for the economy of Ukraine (Pereira et al, 2022);
- digitization, information support and information security of enterprises, development of innovative potential of enterprises (Cherep et al., 2022);
- peculiarities of export by Ukrainian enterprises (Dvulit & Komarenska, 2022);
- peculiarities of strategic decision-making related to enterprise development management (Bezzubko & Tkachenko, 2022).

Based on our experience of previous studies of the development of Ukrainian enterprises, in particular referring to the methodology of company development management (Verba & Hrebeshkova, 2010; Verba, 2011) and consulting support for management decision-making based on strategic controlling (Kyzenko, 2019; Kyzenko et al., 2017), we believe that the above-mentioned topics of the latest publications reflect the current problems of Ukrainian business in terms of search for promising directions of development.

2 Methodology

From April to November 2022, CMC-Ukraine with the support of Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH initiated and implemented the project "Consulting support of small and medium-sized business of Ukraine in the crisis period caused by the war". The sample is random, since we did not apply any criteria by engaging the respondents in the survey. All respondents, on their own initiative, joined the consulting project. Within the project, we received and processed 505 questionnaires filled out by representatives of Ukrainian SMEs enterprises. Based on the results of the project, we analyzed the sample structure at business areas: wholesale and retail trade (13 % of respondents); light and food industry, agriculture and professional, scientific and technical activity (10 % each); construction (9 %); woodworking and furniture production (8 %), as well as different tertiary industries (17 %).

After February 24, 2022, questionnaire and interview methods are actively used in Ukraine to collect relevant information, and the results are quickly published in open sources, which allows comparing data from different sources. By interviewing the participants, we aimed to find out their opinion on the problems of survival and development of their businesses and to identify the need for consulting support to solve the current problems.

3 Results

The working hypothesis is based on the idea that Ukrainian enterprises, changing the practice of forming the directions of enterprise development in existential conditions, switched from formal strategies for their development to the creation of emergent strategies (search for new markets, sources of financing, etc.). Such a

flexible approach eliminates the limitations of the classical methodology of formulating strategic guidelines for company (business) development through the triad "vision — mission — goals" precisely within a highly turbulent environment.

The Ministry of Economy of Ukraine estimates the overall GDP rate decline for 2022 to reach 30 % (Ukrinform, 2022). The factors that influenced socio-economic changes include: population migration (external and internal); destruction of social and industrial infrastructure; loss of production capacity by large industrial enterprises in the territories with active hostilities; reduction of exports of key industries; and change in consumer behavior and the structure of consumer needs.

Ukrainian business is adapting to new conditions and is gradually resuming its work. According to the surveys, the share of enterprises that ceased or almost ceased their operations fell from 86 % at the beginning of March to 47 % at the beginning of May and 12 % of enterprises did not change their capacities or increased them since February 24.

33 % of Ukrainian businesses have an action strategy and have adapted business plans or undergoing the adaptation.

In order to reveal an idea of the development prospects of SMEs enterprises in Ukraine, we analyzed the results of surveys and interviews of representatives of 505 Ukrainian companies that participated in the project "Consulting support of SMEs business of Ukraine in the crisis period caused by the war".

The project primarily engaged the representatives of SMEs enterprises, which are unable to solve the problems of functioning during the war and need help of consultants.

The key issue of our research is to identify the problems of enterprise development within a full-scale military invasion of the Russian federation in Ukraine. Respondents could choose several answers (multiple-choice). The results of the survey are shown in Figure 1.

Figure 1: Problems of functioning of the investigated enterprises that require business consulting

Source: Concluded by the authors based on the results of the survey.

Systematization of the received answers in order of reference frequency (Fig. 1) proves that the most relevant problems for the studied enterprises include searching for new markets (block A, 337 (67 %) respondents) and finding financial resources and cost optimization (block D, 324 (64 %) respondents). Operating processes (block B, 198 (39 %) respondents) and digitalization of business (block E, 182 (36 %) respondents) came in second place in terms of relevance. The least mentioned domain was personnel management (block C, 121 (24) respondents).

In addition to closed answers, respondents could provide their comments on the current problems of the development of their enterprises (open answer). Summarizing the answers provided by the respondents, we should confirm the relevance of requests regarding further development of the investigated enterprises: 53 % of respondents emphasized the problems in marketing (sales); 26 % of respondents are focused on the problems of operational activities (logistics and business processes); and 7 % of respondents deal with finding solutions in digitalization, financing and personnel.

4 Discussion

It should be underlined that all the results of the conducted project were received based on the descriptive statistics and relate to the sample companies. We compared the results of our research with similar studies. The results of our survey are similar to the conclusions published in December analytical report, which reveals a gradual change in short-term expectations and a decrease in the level of uncertainty from the six-month perspective. The share of enterprises where production growth is planned almost doubled in December (from 16.9 % to 32.1 %). At the same time, the share of respondents who could not forecast the changes in the financial and economic situation at the enterprise in six-month period decreased (from 43.8 % to 42.1 %) (Kuzyakiv et al., 2022). The research of the priorities of the activities of SMEs during 2022 proves that there is a shift in the priority of the problems these enterprises solved under various scenarios of the military situation in Ukraine. In the first months (February through May 2022), the main priority was vested to physical and information security issues, which were resolved by the termination of activities and/or relocation of companies. Approximately from May 2022, the focus of attention of entrepreneurs shifted to the search for new business opportunities for the launch/relaunch of their business models: search and conversion of personnel's profile to resume work in new conditions (as well, at a new location); restoration of operational processes (as well, through digitization); and optimization of business models (as well, as a result of lost partnerships). From October 2022, the issue of energy supply became a new challenge for domestic businesses, caused by purposeful destruction of the energy infrastructure by the russian invaders. However, despite the objective risks, starting from autumn domestic enterprises began to actively look for new markets for their goods, new partners for the implementation of business projects and focused on increasing their sales. A conscious purposeful movement of businesses towards the recovery and development of the Ukrainian economy is confirmed by the growth of the rate of optimistic assessments of prospects from the side of entrepreneurs and the focus on the search for development drivers.

5 Conclusions

It should be noted that the obtained results rather raise more questions about the prospects for the development of Ukrainian enterprises in the post-war period than provide answers to them. Firstly, the following question remains open: which indicators should be used to determine promising opportunities for further development when: a) there is no reliable data on the state and course of processes in the economy; b) the prediction horizon is reduced to a few weeks; and c) the risks of economic activity grow exponentially. Development in such conditions requires entrepreneurs to be constantly ready for systemic changes — in processes, structures, values and thinking.

In order to successfully implement the development projects, domestic enterprises should fundamentally change their management model, which involves the spread of an agile approach in decision-making at all levels, the rejection of the hierarchy model in the organization and the expansion of the powers of each employee within the framework of the value he/she creates, focusing on the needs of customers. Accordingly, it is necessary to prepare systemic transformations at the level of each enterprise and form business ecosystems, which can fundamentally change Ukrainian business.

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THE RELATIONSHIP BETWEEN ORGANIZATIONAL PRIDE, JOB CHARACTERISTICS AND JOB SATISFACTION: A LITERATURE REVIEW

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Abstract Employees with a strong sense of pride in their organization may be more satisfied at work. This is because organizational pride can increase a person's sense of meaning and purpose in their work. Organizations should pay attention to job characteristics to enhance organizational pride and job satisfaction. The purpose of this study is to examine the relationship between organizational pride, job characteristics, and job satisfaction. Firstly, this paper defines organizational pride, job characteristics and job satisfaction. After that, there is a literature review of the previously reported findings regarding the relationship between organizational pride, job characteristics and job satisfaction. From a review of the extant literature on job characteristics, organizational pride and job satisfaction it can be concluded that future research needs to look into how job characteristics relate to organizational pride and job satisfaction because there is not enough research on the relationship between job characteristics and organizational pride.

Keywords:
organizational pride,
job pride,
job characteristics,
job characteristics model
job satisfaction

JEL:
J24, J28, M12

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1 Introduction

The problem of this study is addresses in the relationship between Organizational Pride (OP), Job Characteristics (JC), Job Satisfaction (JS). The study examines the importance of OP in enhancing JS through JC. The study is important because it identifies the role of OP in improving JS, which in turn can lead to better JS. The literature review suggests that there is a positive relationship between JC, OP and JS. Precisely, some authors analyze a positive relationship between OP and JC (Seddik et al., 2022), and some analyze a positive relationship between JC and JS (Ali et al., 2014; Andrew et al., 2014). Despite the growing interest in OP, there is a lack of scientific studies that specifically focus on this construct. As a result, there needs to be more research on the relationship between JC and OP, so researchers must further look into how JC relate to OP and JS. This paper will define terms and examine the relationship between OP, JC and JS.

2 Literature Review

2.1 Organizational pride

According to psychological research, pride is a positive emotion that arises when a perceived performance exceeds expectations or social standards (Verbeke et al., 2004). Pride is associated with feelings of joy, meaningfulness and increased self-esteem (Tracy & Robins, 2007). OP is defined as organizational performances such as creating a productive, motivating work environment and high social identification with the organization (Kraemer & Gouthier, 2014). Furthermore, employees are proud because they believe their roles are essential to the organization and the public (Gouthier & Rhein, 2011). Wollack et al. (1971) define OP as the joy and satisfaction that employees experience as a result of doing a good job. Organizations that provide a pleasant working environment for their employees and assist them in developing a sense of pride in themselves, cause them to respect and be proud of their jobs (Kamani, 2017). OP is related to self-esteem and is a valuable psychological resource because it provides intrinsic motivation for employees (Mas-Machuca et al., 2016). According to Kraemer and Gouthier (2014), OP can make exploring an employee's intentions to quit easier. In other words, an employee with OP is more likely to remain with the company.

Even though OP has not yet received much attention in scientific studies, this construct is crucial for business success (Gouthier & Rhein, 2011). Similarly, Kraemer and Gouthier (2014) assert that OP is vital in businesses and has a negative impact on turnover intentions. Their findings show that OP increases stress resistance and, as a result, decreases turnover intentions. Arnett et al. (2002) indicate that JS affects OP positively. Furthermore, Gouthier and Rhein (2011) claim that there is a positive and substantial association between OP and commitment to customer service and creativity. On the other hand, according to Mas-Machuca et al. (2016), OP will improve employees' work-life balance, encourage employees, and result in improved JS.

2.2 Job characteristics

The JC Model (JCM) states that jobs that include naturally motivating characteristics will lead to higher levels of JS (Hackman & Oldham, 1976). In the JCM model, the first three dimensions are skill variety, task identity and task significance—combined to provide meaningful work that the employee perceives as significant, useful and worthy. Jobs with a lot of autonomy provide employees with a sense of personal responsibility for the results, and feedback informs them how well they're doing (Robbins & Judge, 2019).

Skill variety refers to the extent to which the job requires the employee to draw from several different skills, abilities and knowledge (Hackman & Oldham, 1975). Morris and Venkatesh (2010) define skill diversity as the extent to which a job requires several skills. Job diversity contributes to a better job design by enhancing JS and motivation. Moreover, ***task identity*** refers to whether the job has an identifiable beginning and end or how complete a working module the employee performs (Hackman & Oldham, 1975). Task identity, according to Coelho and Augusto (2010), indicates that each job requires a combination of knowledge, abilities and the capacity to use a variety of activities and duties. Hoonakker et al. (2004) state that task identity connects to the workforce's quality of working life. ***Task significance*** refers to the extent to which the job significantly influences other people's lives or work inside the immediate company or in the external world (Hackman & Oldham, 1975). When employees believe that the job they perform has a purpose, there will be a strong feeling of responsibility in completing tasks. This responsibility will drive employees to work harder to complete their tasks (Hackman

& Oldham, 1975). Furthermore, ***autonomy*** refers to job independence and how much freedom and control employees have to perform their job (Hackman & Oldham, 1975). According to Zimmer-Gembeck and Collins (2006), autonomy is the ability to think, feel, decide and take action. The final dimension, ***feedback***, refers to objective information about progress and performance from the job supervisors or any other information system (Hackman & Oldham, 1975).

2.3 Job satisfaction

According to Spector (1997), JS is the degree to which someone is satisfied or dissatisfied with their job. Locke (1976) indicates that JS is a pleasant or positive emotional state that results from an individual's job evaluation or work experience. On the other hand, Betts (2000) defines JS as the job holder's perception of the job, which determines the level of satisfaction based on physiological and psychological factors (Bajwa et al., 2019). Furthermore, Aziri (2011) describes a paradigm for the new manager who insists on treating employees as individuals with desires, needs and personal goals. Paradigma is a crucial component of JS in modern organizations and businesses, so that means that happy employees are satisfied employees, and satisfied employees are successful employees (Aziri, 2011). Employees' perceptions of certain aspects of the job and the relationship between their expectations or needs and their perceptions when performing the job all contribute to JS (Locke, 1969).

In literature, there are different methods for measuring employee JS. Locke (1969) has extensively discussed measuring overall JS or assessing each element of JS, such as pay and supervision. However, since jobs cannot be perceived or evaluated as a single unit, overall satisfaction is the sum of the job element evaluations. Employee JS has attracted the interest of organizational researchers for decades. Reviewing previous research, Gupta and Joshi (2008) conclude that JS is essential for motivating employees to work harder (Saleem et al., 2010). They agree that JS is critical because most people spend most of their time at work. When employees are happy with their jobs, they have a more positive impression of the organization's products and services, and that provides better customer service (Bontis et al., 2011).

3 The relationship between organizational pride, job characteristics and job satisfaction

Many studies have shown a positive relationship between JC and JS and also a positive relationship between OP and JS. Still, there is not enough research on the relationship between JC and OP. Table 1 shows findings about the previously mentioned variables.

Table 1: Literature review on the previously reported findings about organizational pride, job characteristics and job satisfaction

Authors	Year	Variables	Findings
Seddik, Elsetouhi and El-Biali	2022	Job Characteristics Organizational Pride	Direct positive significant effects of job characteristics on organizational pride.
Widyanti, Irhamni, Ratna and Basuki	2020	Organizational Pride Job Satisfaction *Organizational Justice* *Job Performance*	Organizational pride has a positive and significant influence on job satisfaction.
Anh, Tri and Tu	2022	Organizational Pride Job Satisfaction *Work-life balance* *Organizational Commitment*	Organizational pride is positively related to job satisfaction.
Mas-Machuca, Berbegal-Mirabent and Alegre	2015	Organizational Pride Job Satisfaction *Work-life balance*	Organizational pride is positively related to job satisfaction.
Fiernaningsih, Nimran, Raharjo and Arifin	2019	Organizational Pride Job Satisfaction *Work-life balance*	There is no significant effect of organizational pride on job satisfaction.
Ali, Said, Yunus, Kader, Latif and Munap	2014	Job Characteristics Job Satisfaction	Job characteristics are positively related to job satisfaction.
Andrew, Haris, Zakariah and Zekaria	2014	Job Characteristics Job Satisfaction	Job characteristics are positively related to job satisfaction.

Source: Ali et al. (2014), Anh et al. (2022), Fiernaningsih et al. (2019), Andrew et al. (2016), Mas-Machuca et al. (2016), Seddik et al. (2022), Widyanti et al. (2020).

Seddik et al. (2022) examined the effect of JC named skill variety, task identity, task significance, autonomy and feedback on OP for employees of Mansoura banks. The questionnaire was distributed to 400 Mansoura bank workers in order to collect data for the study. According to the findings of the study, JC (skill variety, task identity, task significance, autonomy and feedback) had a direct positive significant effect on OP (Seddik et al., 2022). Furthermore, Widyanti et al. (2020) analyzed the relationship between organizational justice and OP on JS and job performance among employees at private universities in Indonesia. This study uses a quantitative approach by administering a questionnaire to 200 respondents. The results show that organizational justice and OP can positively and significantly influence JS and

job performance (Widyanti et al., 2020). Some authors analyze how work-life balance affects OP and JS of employees, and results show that OP can positively and significantly influence JS. (Anh et al., 2022; Mas-Machuca et al., 2016). On the other hand, Fiernaningsih et al. (2019) have also analyzed the mentioned variable, and the results show no significant effect of OP on JS.

Ali et al.'s (2014) study examined the application of the JC model to JS from the viewpoint of fast food outlet managers. The primary goal of this study is to identify the link between JC and JS among fast food restaurant managers, as well as which of the five aspects of the JC model contributes the most to JS among fast food restaurant managers. According to the findings of the study, the five dimensions of the JC model positively connect to JS among fast food restaurant managers (Ali et al., 2014). Similarly, Andrew et al. (2016) explored the positive relationship between JC and JS among employees at the Human Resource Department at Craun Research Sdn. Bhd., Kuching. According to the findings of this study, there is a link between JC and JS. Employees who were treated well were more likely to do well at work. Employees should be encouraged to be honest about their job or line of employment. According to the studies, proper employee placement will provide an organization and its employee's wealth and satisfaction (Andrew et al., 2016).

4 Conclusion

Pride is a positive emotion that arises when a perceived performance exceeds expectations or social standards. On the other hand, JS is the degree to which someone is satisfied or dissatisfied with their job. JC such as autonomy, feedback and task identity are positively related to OP and JS. The paper highlights the importance of OP and JC in improving JS. A better understanding of OP, JC and JS can be used as a guide for future research on explaining the relationship between the mentioned variables. The JC model is positively linked to JS, and findings suggest that organizations can improve OP and JS by considering and addressing JC. OP has not been thoroughly studied, like JC and JS, and it is crucial for business success. Future research should examine how JC relate to OP and JS and managers should improve the work environment and characteristics for employees in order to increase their loyalty and sense of respect while doing their duties.

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ARE SLOVENIAN MANUFACTURING COMPANIES READY FOR INDUSTRY 4.0?

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Abstract This paper focuses on the diffusion of digital technologies in Slovenian manufacturing companies with respect to the concept of Industry 4.0. We present an Industry 4.0 readiness index and assess the Industry 4.0 readiness of Slovenian manufacturing companies. This index focuses on the use of selected digital technologies and their distribution within specific technology fields. The results are based on a sample of 141 Slovenian manufacturing companies whose data was collected as part of the latest edition of the European Manufacturing Survey 2022. The results show that the use of included digital technologies differs between companies and that the majority of manufacturing companies is still far away from the highest Industry 4.0 readiness levels.

Keywords:
manufacturing company, digital technology, Industry 4.0, Readiness Index, European manufacturing survey

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1 Introduction

Industry 4.0 can be briefly defined as the digitalization of production and services. The general understanding of the Industry 4.0 concept includes fully automated physical systems, but it should also be considered as automated and intelligent decision-making systems, not only automated physical systems (Elibal & Oezceylan, 2021). Industry 4.0 is characterized by sophisticated automation and digitalization processes and the use of electronics and information technologies in production and services (Yang, 2017). Digitization refers to the diverse sociotechnical phenomena and processes of adopting and using (digital) technologies in broader individual, organizational, and societal contexts (Legner et al., 2017). The adoption of digital technologies (DT) affects almost all areas of modern businesses, including manufacturing/production processes (Plekhanov et al., 2002). To determine the prevalence of different DTs, we analyzed selected technologies from the "digital factory" field. Therefore, our research presents use of seven selected DTs characteristic of the Industry 4.0 era in the Slovenian manufacturing industry. In addition to analyzing the diffusion of these technologies, this paper also presents an Industry 4.0 readiness index and assesses the Industry 4.0 readiness of Slovenian manufacturing companies.

This paper is organized as follows: First, the concept of Industry 4.0 readiness and maturity models in general are presented, followed by the Industry 4.0 readiness index that we used in our research. In the methodology section, we explain the characteristics of the European Manufacturing Survey (EMS). Then we present the use of selected DTs in Slovenian manufacturing companies and the results obtained using the Industry 4.0 readiness model. Finally, we conclude with a discussion of the results and some implications for business management, limitations of the research, and directions for future research.

2 Industry 4.0 readiness & Maturity Models

With the emergence of the Industry 4.0 concept, both scholars and practitioners face the challenge of determining the current maturity and readiness of companies for Industry 4.0 concepts (Elibal & Oezceylan, 2021). To perform better, industry and academia have continuously sought to develop and refine self-assessment models that can be used to assess companies' Industry 4.0 readiness (Hizam-Hanafiah et al., 2020). Identifying these Industry 4.0 readiness models is also of great importance as

they allow companies to measure antecedents and preconditions in the digital transformation process, which can then lead to organizational transformation (Canetta et al., 2018).

The Industry 4.0 readiness model attempts to represent how ready a company is to implement advanced technologies and concepts. Some authors define the readiness model as "the degree to which organizations can take advantage of Industry 4.0 technologies" (Hizam-Hanafiah et al., 2020), while others define it as "a tool to conceptualize and measure the baseline situation and initialize the development process" (Schumacher et al., 2016). To successfully master Industry 4.0 readiness, researchers from academia and industry have developed a variety of Industry 4.0 readiness models in recent years.

Schumacher et al. (2016) developed a maturity model to assess the Industry 4.0 readiness and maturity of manufacturing companies. Their main goal was to extend the prevailing technology focus by including organizational aspects. De Carolis et al. (2017) developed a maturity assessment method to measure the digital readiness of manufacturing companies. Using different dimensions, they assess 5 areas in which key manufacturing processes can be grouped: 1) design and engineering, 2) production management, 3) quality management, 4) maintenance management, and 5) logistics management. Canetta et al. (2016) proposed a digitalization readiness model to assess the state of a company's journey towards Industry 4.0, taking into account five dimensions: 'strategy', 'processes', 'technologies', 'products and services', and 'people'. Pacchini et al. (2019) proposed a model that includes eight technological enablers that are most relevant based on existing literature: Big Data, Internet of Things (IoT), cloud computing, autonomous robots, additive manufacturing, cyber-physical systems, augmented reality, and artificial intelligence.

3 Industry 4.0 Readiness Index

Our proposed Industry 4.0 readiness index was developed by Fraunhofer ISI to analyze the data collected in our research: EMS (Lerch et al., 2016). The logic of the Fraunhofer Industry 4.0 Readiness Index is shown in Figure 1 and is based on the selected DTs. Since the different technologies are highly process and operation dependent and come from different technology fields, a simple enumeration of the technologies used is not sufficient for an Industry 4.0 Readiness Index. Therefore, these DTs are divided into three technology fields: Digital Management Systems,

Wireless Human-Machine Communication, and Cyber-physical System (CPS)-related Processes. While the first two technology fields cover IT-related processes (Industry 4.0 basic technologies) and still have a clear distance to Industry 4.0, the technology field CPS already contains initial approaches to networked/digital production and can therefore be classified as closer to Industry 4.0 than the other two technology fields (Lerch et al., 2016).

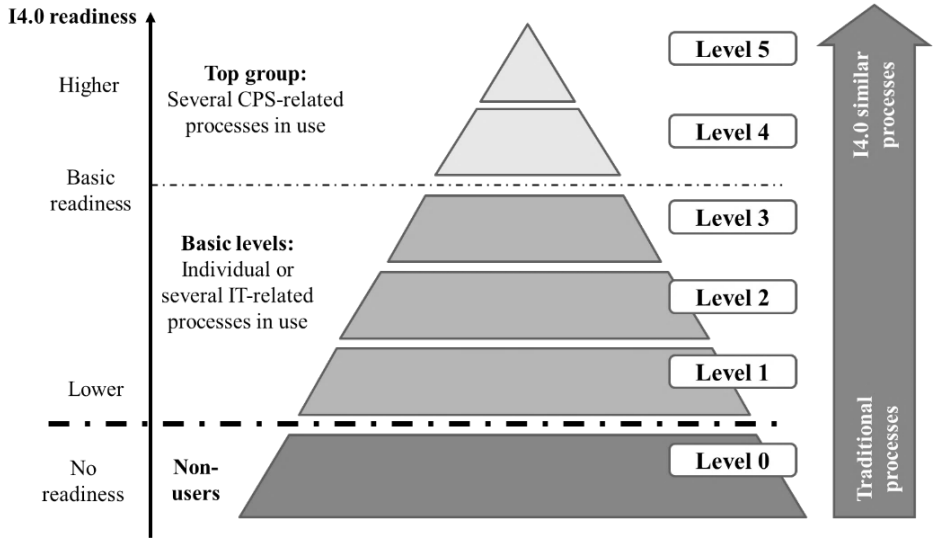

Figure 1: Industry 4.0 readiness index

Source:(Lerch et al. (2016)

With this grouping, companies can be classified as Industry 4.0-related companies that, on the one hand, use and combine several technology fields in production and, on the other hand, use several of the CPS -related processes in their production. Accordingly, the Industry 4.0 readiness index results in the following main groups and levels:

Non-users who are not (yet) ready for Industry 4.0:

- Level 0: Companies that do not use any of the Industry 4.0 enabling technologies and tend to still rely on traditional production processes.
- Basic levels, as the basis on the way to Industry 4.0, with little readiness:
- Level 1 (beginners): Companies that use IT-related processes in one of the three technology fields.

- Level 2 (advanced beginners): Companies that use IT-related processes in two of the three technology fields.
- Level 3 (advanced users): Companies that are active in all three technology fields and use both IT-related processes and CPS-related processes.
- Top group, as a pioneer on the way to Industry 4.0, with a slightly higher readiness:
- Level 4: Companies that are active in all technology fields and use at least two technologies of CPS-related processes.
- Level 5: Companies that are active in all technology fields and use at least three technologies of the CPS-related processes.

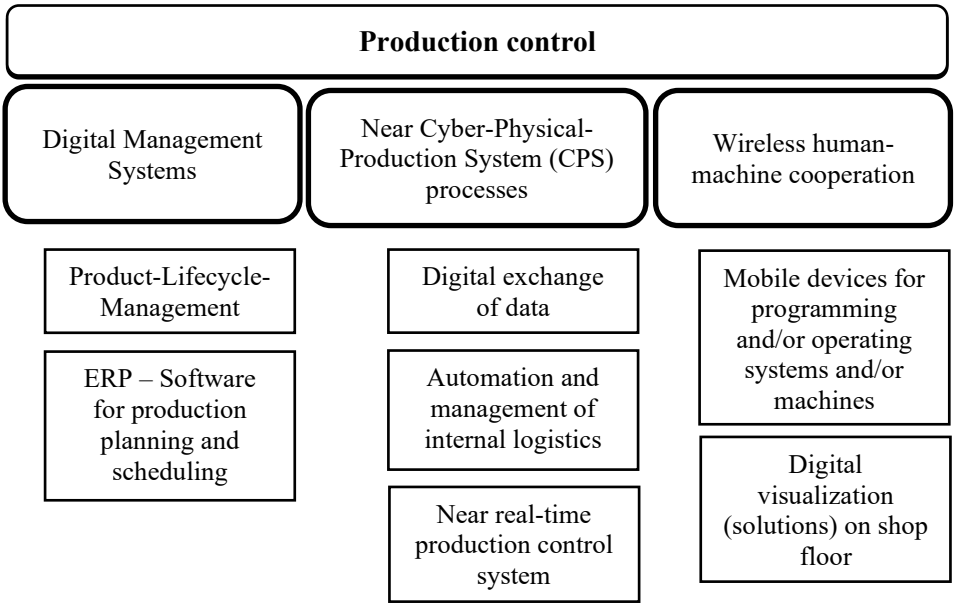

Figure 2: Industry 4.0 readiness index with selected DT
Source: Lerch et al. (2016)

With each level, the status of Industry 4.0 maturity increases or the distance to networked production decreases. While there is no readiness for Industry 4.0 in stage 0, companies in stages 1 to 5 have a basic readiness. However, companies that already use IT-related processes (levels 1 and 2) have a greater distance to Industry 4.0 than companies in levels 3 to 5 that are already implementing the first elements of networked production. But even at levels 4 and 5, it cannot be assumed that the

threshold to Industry 4.0 has been crossed. Rather, the distance to networked production has merely decreased. This Industry 4.0 readiness index can be used to map the change from traditional production to Industry 4.0-related production. Companies with a higher level have already made the transition to a greater extent than companies with a lower level (Lerch et al., 2016). Figure 2 shows all three technology fields in the Industry 4.0 Readiness Index with the associated DTs.

4 Methodology

The research data was collected as part of EMS, coordinated by the Fraunhofer Institute for Systems and Innovation Research – ISI, which is the largest European survey of manufacturing. The survey' questions address manufacturing strategies, the use of innovative organizational and technological concepts in production, cooperation issues, production offshoring and backshoring, servitization, and workforce deployment and skills issues. Data is also collected on performance indicators such as productivity, flexibility, quality and return on investment. In the last round of the survey EMS, we added questions on digital elements of products, new business models, artificial intelligence, circular economy, etc. The survey takes place every three years. In most countries, EMS is organized as a paper-based survey at the company level (the core questionnaire is six pages long). The people contacted to fill in the questionnaires are the production managers or the general managers of the manufacturing companies. The responding companies represent a cross-section of the major manufacturing industries. These include manufacturers of rubber and plastics, the metal industry, mechanical engineering and the electrical industry.

The survey is administered to manufacturing companies (NACE revision 2 codes from 22 to 32) with at least 20 employees. The main objectives of the EMS project are to find out more about the use of production and information technologies, new organizational approaches in manufacturing and the implementation of best management practices. Our research is based on data from EMS from a Slovenian subsample from 2022. We received 141 responses – a response rate of 16%. We divided manufacturing companies into three classes based on the number of employees. The largest share of respondents came from medium-sized companies (around 49%), followed by small companies (31%) and large companies (20%).

5 Results

The analysis shows (Table 1) that digital solutions for providing drawings, routings, or work instructions directly on the store floor and software for production planning and control (e.g., ERP or APS systems) are the most commonly used technologies, installed in about two-thirds of Slovenian manufacturing companies. Mobile/wireless devices for programming and controlling machines and/or equipment and digital exchange of product/process data with suppliers/customers (Electronic Data Interchange EDI) are also catching up and are installed in almost 50% of Slovenian manufacturing companies.

Table 1: DT adoption in Slovenian manufacturing companies

Digital technology	Share [%]
Mobile/wireless devices for programming and controlling machinery and/or facilities	47.5%
Digital solutions to provide drawings, work schedules, or work instructions directly on the shop floor	64.5%
Software for production planning and scheduling (e.g. ERP or APS system)	63.8%
Techniques for automation and management of internal logistics (e.g. Warehouse management systems, RFID)	27.7%
Digital Exchange of product/process data with suppliers/customers (Electronic Data Interchange EDI)	44.0%
Product-Lifecycle-Management-Systems (PLM) or Product/Process Data Management	17.7%
Near real-time production control system (e.g. Systems of centralized operating and machine data acquisition, MES)	33.3%

Using these DTs helped us develop Industry 4.0 readiness levels for Slovenian manufacturing companies. Figure 3 shows the distribution of all six Industry 4.0 readiness levels described. Around 14% of all companies have not yet installed any DTs in production. A little under 60% of all companies already have IT-related processes in their production and form the basic levels. This group of basic users includes the group of beginners that only use technologies from one area (almost 18%; level 1), the advanced beginners that are active in two technology areas (almost 24%; level 2), but also the already advanced companies that combine technologies from all three technology areas (over 16%; level 3). In the two highest levels, 4 and 5, this top group consists of a total of 28.4% of all companies. Accordingly, around one in four companies is active in all three technology areas and uses not only IT-related processes but also several CPS-related processes simultaneously. Levels 4 and 5 have a very similar proportion of companies.

A look at the Slovenian manufacturing sector shows that there is still a certain proportion of companies that rely heavily on traditional production processes (non-

users). The main group of Slovenian manufacturing companies has slowly started to use IT-related processes, but there is a big difference between beginners and advanced users. The former are closer to the non-users in terms of the type of manufacturing processes, and the advanced companies are slowly preparing to join the top group. The top group is not only active in each of the three technology areas, but also uses several CPS-related processes. There is some willingness to digitize their production, with level 5 companies in particular (14.9%) appearing to be preparing for or already trying to implement Industry 4.

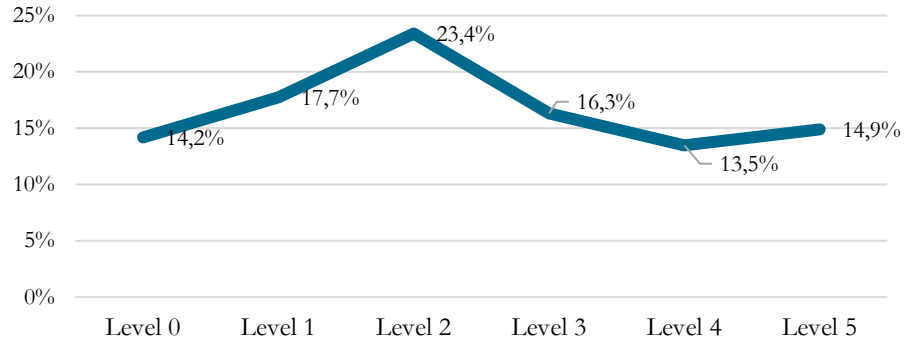

Figure 3: Industry 4.0 readiness index in Slovenian manufacturing companies
Source: Authors' calculations.

6 Discussion and Conclusion

Our results show that the use of DT in Slovenian manufacturing companies depends on the type of technology and the characteristics of the manufacturing company. Not surprisingly, not all selected DT are equally suitable for all manufacturing companies in the included industries. Nevertheless, some of the included DT are beneficial or even absolutely necessary in all manufacturing companies (e.g. ERP or real-time data collection) but are still not present in all companies. The absence of DT is several manufacturing companies is also evident from Industry 4.0 readiness assessment. Almost 50% of manufacturing companies use only from 0 to 2 DTs.

Our research has several limitations and consequently several future research agendas. For this research, we only considered the general distribution of the selected DTs, regardless of company characteristics such as size, OEM or supplier status, technological intensity of the industry to which they belong, etc. We have also

neglected some other specific characteristics, such as product complexity, production type and innovation capability. Another limitation is that we observed only one country and the number of cases was limited. In our future research, we will conduct a multinational study with a much larger sample of manufacturing companies. Our future research will also look more deeply into the combinations and relationships between DTs and their effects on firm performance.

Our findings have some initial implications for business management. The presented Industry 4.0 readiness index can serve as a simple tool for managers to assess which DT and the nature of its structural distribution contribute to the determination of the basic Industry 4.0 readiness index. It also enables managers to compare the level of Industry 4.0 readiness of their company with that of other Slovenian manufacturing companies from their industry.

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THE FAILURE OF BUREAUCRACY ON "NEXTGENERATIONEU" FUNDS DESTINED TO REFURBISHING BUILDINGS IN CATALONIA

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Abstract The deployment of the «NextGenerationEU» (NG) funds is an exceptional and multifaceted moment. In Spain, among other objectives, such resources help finance the refurbishment of buildings and dwellings with the ultimate goal of increasing the energy efficiency and sustainability standards. Therefore, subsidies contribute to the struggle against the climate crisis and the European energy dependence. Under the framework of the Royal Decree 853/2021, the central government of Spain has regulated six subsidy programmes for such purposes. Regions are entitled to distribute the funds and deploy their own grant proceedings. In Catalonia, the situation is surprising because the exposed subsidies are demanded in very low levels. Thus, the present paper analyses the causes behind the failure of bureaucracy on NG funds dedicated to restoring buildings and dwellings in Catalonia, following an approach based on the analysis of official publications to detect three great administrative inefficiencies and propose corrective measures.

Keywords:
buildings, energy efficiency, refurbishment, grants, *NextGenerationEU*

JEL:
D73, H25, K25

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1 Introduction

It is well known the fact that buildings contribute to global warming. Actually, concrete production is responsible of 8% of the global carbon dioxide emissions, equivalent of more than a single country except China or the US (Harvey, 2021). Also, the energy demand required for heating, cooling, lighting and providing electricity to equipment causes 40% of Europe's energy demand, most of it (80%) originated from fossil fuels (United Nations Environment Programme, 2022, 30). Thus, the UN has set a sustainable development goal (SDG) worldwide related to cities (SDG no. 11), aiming to "Make cities and human settlements inclusive, safe, resilient and sustainable" (United Nations, 2023).

In this context, the European Union has presented a large-scale plan, integrated within the *NextGenerationEU* (NG) funds, that pretends to double the annual refurbishing rate of residential and non-residential buildings and thus improve 35 million building units by 2030; to create 160,000 green jobs in the construction sector's renovation wave; and in the long run, to foster building renovation for reaching climate neutrality by 2050 (European Commission, 2020: 2-3). By the Royal Decree 853/2021, the Spanish central government has regulated the framework of six grant programmes that distribute the NG funds for buildings among the 17 regions or autonomous communities of the country. Henceforth, such administrations have determined other public bodies in charge of processing requests, with increasing complexity of procedures and where various professionals are mandatory for a successful application. At present, in Catalonia most of the ownership associations and individual proprietors have omitted to present their requests and funds destined to the 2022 budget are available in the middle of 2023, in significant amounts. Then, our research question is mandatory: "Why NG funds for refurbishing buildings and dwellings in Catalonia are not solicited as expected?".

2 Theoretical Background

In this section is depicted the theoretical and regulatory background behind the deployment of NG funds in Catalonia. It conceptualises the programmes, the policies' characteristics and the territorial distribution of resources. First of all, the Royal Decree 853/2021, of 5 October, has determined the programmes for all Spain. Table 1 illustrates a summary of their properties.

Table 1: Description of the NG programmes dedicated to buildings in Spain, by number.

1	**Refurbishment grants at the neighbourhood level**. The funds are destined to restore buildings with residential use and re-urbanisation of public spaces inside the so-called ERRP (letters that stand for "Residential Areas of Programmed Refurbishment", in Castilian), which have been delimited in municipalities previously. Population is not a determinant factor for establishing an ERRP. The main goal is reaching at least 30% savings in primary energy consumption. Subsidies range from 8,100 to 21,400 euros per refurbished dwelling, depending on the energy efficiency attained.
2	**Support funds for refurbishment offices**. The Spanish legislator has created a category which does not seem much related to the other programmes, as resources are only destined to the bureaucratic apparatus and not to improvements in energy efficiency in buildings. The funds are destined to the autonomous communities, local administrations and other public and private bodies to coordinate, inform and manage the grants, excluding the ones of the first programme.
3	**Refurbishment grants for buildings**. They are destined to residential buildings with one or more households, with the goal of increased energy efficiency. A technical analysis has to endorse significant savings in the consumption of non-renewable primary energy (at least 30%, compared to before the implementation) and energy demand (at least 35% or 25% in heating and cooling demand, depending on the climate of the geographic area where the building is located). In this case, the grant ranges from 6,300 to 18,000 euros per dwelling, subject to energy efficiency improvements. There are extra funds for the removal of asbestos, up to 12,000 for each entire building.
4	**Refurbishment grants to increase the energy efficiency of dwellings**. Such funds are destined to the owners of dwellings who desire to improve the energy efficiency of their usual residence. The resources cover the replacement of doors, windows or variations in the climate control systems to start renewable energy or biomass equipment, instead of fossil fuels. The minimum cost of the intervention is fixed at 1,000 euros and the grant reaches a maximum of 3,000 euros, reaching up to 40% of the whole refurbishing costs.
5	**Grants for Building and Project Book preparation**. A Building Book is a technical report which depicts the properties of a building, including use and maintenance. It describes the necessary measures for improvements in energy efficiency. The programme funds the professional expenses of the elaboration of the Building Book and the development of technical refurbishment projects. There are different grant ranges, with top amounts set at 3,500 euros for the Building Book and 12,000 for the technical refurbishment projects.
6	**Construction of dwellings under social rent schemes in energy efficient buildings**. The programme pretends to build from scratch or rehabilitate buildings situated on terrains of public ownership, with the aim of incorporating them as affordable housing assets. Public-private partnerships (PPP) are considered to be the priority for optimising the allocation of funds. Social housing financing has a limit of 700 euros per square metre of useful surface of residences, with a maximum of 50,000 euros per dwelling.

Source: Adapted from the Royal Decree 853/2021, of 5 October. Ministry of Transports, Mobility and Urban Agenda of Spain (2021).

The Spanish regions manage the NG funds with a relative self-ruling competence. In Catalonia the situation is characterised by a notable fragmentation. At first, an office dependent on the City Council of Barcelona, the Barcelona Housing Consortium (CHB, in Catalan), concentrates its services on the petitions coming from the largest city of the region. Secondly, an office of the Metropolitan Area of

Barcelona (AMB), called the Barcelona Metropolitan Housing Consortium (CMH), attends the requests coming from municipalities situated in the metropolis, but excluding the city of Barcelona. Finally, the Catalonia Housing Agency (AHC) offers administrative coverage for the rest of the regional territory (Figure 1).

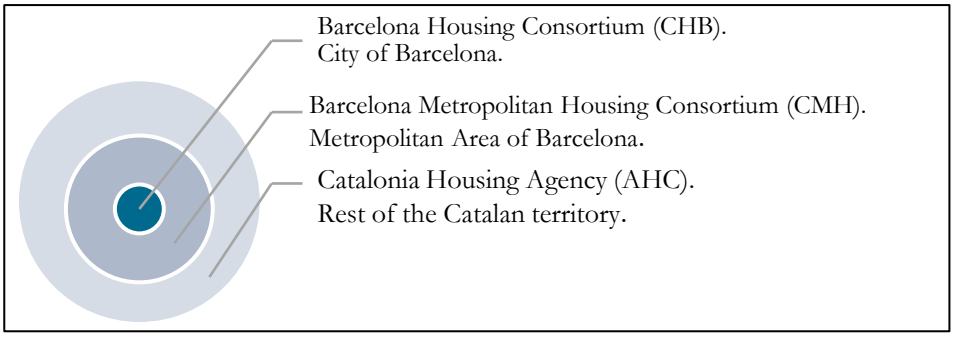

Figure 1: Institutions involved at refurbishing grants in Catalonia.
Source: Graph elaborated by the author.

Table 2: Calls for refurbishing grants in Catalonia (Programmes 1 to 5 currently in force)

Institution	Territory	Programmes	BDNS ref.
Catalonia Housing Agency (AHC)	Catalonia without the city of Barcelona and the metropolitan area	3 | 4 | 5	616994
	Whole Catalonia. After the *pre-selection* phase, the call for applications is expected to be published during April-May 2023.	6	Not available
Barcelona Metropolitan Housing Consortium (CMH)	Metropolitan area of Barcelona (AMB) excluding the city of Barcelona	1 | 3 | 4 | 5	623085
Barcelona Housing Consortium (CHB)	City of Barcelona	3 | 4 | 5	632786
	City of Barcelona, only defined ERRPs	1 | 4 | 5	634272
	City of Barcelona, only defined ERRPs of the Neighbourhood Plan	1 | 4 | 5	634273
	City of Barcelona, *Besòs - Maresme* area	1 | 4 | 5	634274
	City of Barcelona, *Can Peguera* area	1 | 4 | 5	634275
	City of Barcelona, *Canyelles* area	1 | 4 | 5	634276
	City of Barcelona, *Congrés - Indians* area	1 | 4 | 5	634277
	City of Barcelona, *La Pau* area	1 | 4 | 5	634278
	City of Barcelona, *Trinitat Vella* area	1 | 4 | 5	634279

Source: 2022 calls published at the Official Journal of the Government of Catalonia (DOGC).

Table 2 illustrates the grant procedures produced by the exposed institutions that are currently in force in Catalonia. The state of affairs is particularly difficult in the city of Barcelona, where CHB has participated in numerous calls that can be overlapping and thus oblige citizens to consult a grant specialist. The National Grant Database of Spain (BNDS) provides an individual code for each proceeding, which is paramount for successful call identifications, as CHB omits publishing any other references. The numerous calls try to target certain areas affected by gentrification and speculation; however, public intervention in the city produces inefficiencies and distortions (Uzqueda et al., 2021).

3 Methodology

The methodology is characterised by a literature review of official publications, centred in grant regulations destined to restoring buildings and dwellings in Spain and particularly in Catalonia. They were issued during the years 2021 and 2022, under the *NextGenerationEU* framework, and are currently in force. It is expected that the programmes will last until June 2026 with small variations. As the deployment of such public policies is relatively new and is on the move right now, the scientific literature in the field is limited. Qualitative content analysis and close reading of the applicable regulations allow identifying the relevant alignments and weaknesses of the policies. The objective of the research is to identify the reasons behind the lack of demand in Catalonia for NG funds destined to refurbishing.

4 Results

The first aspect to be analysed is the territorial distribution of resources in the country. Setting four outlier regions apart, it is clear that the prevalent factor has been the fraction of the Spanish population in 2020-2021, with slight variations among territories. At first sight, there are no detectable correlations that can explain the existing gaps in population and assigned funds, like urban vs. rural areas, high vs. low income territories, more vs. less populated regions, or even the north vs. south divide. The Princedom of Asturias holds the highest positive variation of funds compared to its population, while the autonomous cities of Ceuta and Melilla register the weakest ratios. Catalonia is to some extent underserved of resources at -1.35%, compared to its population. If the transfer was remarkable, we could infer

that the hypothetical extraordinary funds would explain the lingering resources, but it is not the case. Table 3 presents regional distribution of the NG funds.

Table 3: Regional distribution of the NG funds (Programmes 1 to 5 of the RD 853/2021).

Autonomous community / Region	% of the total funds	% of the State population (2021)	Differential (% funds minus % population)	% of disparity (funds compared to the population in 2021)	±
Andalucía	17.370	17.880	- 0.510	- 2.85%	
Aragón	2.897	2.799	+ 0.098	+ 3.50%	
Principado de Asturias	2.429	2.135	+0.294	+ 13.77%	
Illes Balears	2.461	2.475	- 0.014	- 0.57%	
Canarias	4.591	4.586	+ 0.005	+ 0.11%	
Cantabria	1.296	1.234	+ 0.062	+ 5.02%	
Castilla y León	5.441	5.029	+ 0.412	+ 8.19%	
Castilla – La Mancha	4.212	4.325	- 0.113	- 2.61%	
Catalunya / Catalonia	16.163	16.384	- 0.221	- 1.35%	
Com. Valenciana	10.821	10.675	+ 0.146	+ 1.37%	
Extremadura	2.305	2.236	+ 0.069	+ 3.09%	
Galicia	5.845	5.689	+ 0.156	+ 2.74%	
Com. de Madrid	14.007	14.248	- 0.241	- 1.69%	
Región de Murcia	2.939	3.205	- 0.266	- 8.30%	
Com. Foral de Navarra	1.380	1.396	- 0.016	- 1.15%	
País Vasco (Euskadi)	4.858	4.672	+ 0.186	+ 3.98%	
La Rioja	0.698	0.675	+ 0.023	+ 3.41%	
Ceuta	0.146	0.176	- 0.030	- 17.05%	
Melilla	0.141	0.182	- 0.041	- 22.53%	
Total of Spain	100.000	100.000	0.000		

Sources: Data adapted and calculated from the Ministry of Transports, Mobility and Urban Agenda of Spain (2021: article 5) and National Institute of Statistics of Spain (2022).

Therefore, inefficiencies that explain the low demand may be observed directly at the grant procedures that are currently deployed in Catalonia. To simplify the viewpoint, here is a brief analysis of a possible request made for restoring a building located in the city of Barcelona. In this context, it is applied the framework of the Programme 3 of the Royal Decree 853/2021, under the call of the Barcelona Housing Consortium (CHB) with BDNS ref. 632786 (Figure 2).

At first, citizens with interest in the subsidy will probably take a look at the website of the municipality (Barcelona City Council, 2023). They may have the first impression that the Local Renovation Office is the public body in direct charge of

managing the requests and the funds. However, in this case most of the proceedings will be managed by external professional organisations before reaching the City Council: the Association of Architects of Catalonia (COAC), the Association of Technical Architects and Building Engineers of Barcelona (CATEB) and the Council of Territorial Associations of Property Administrators of Catalonia (CCTAFC). Consequently, citizens will contact the related professionals (step 1).

Before presenting the formal request of the grant (step 4), two verifications will be made simultaneously, which are very demanding in terms of documents (step 2). The "technical suitability" analyses the adequacy of the project and energy efficiency improvements with the subsidy rules. It is managed by the COAC or the CATEB, at the choice of the gran applicant, and requires hiring a professional that has to be a member of an association. The expert will generate the required files and present them online. After verifying 20 documents, the COAC or the CATEB will produce a first suitability code (step 3).

The "administrative suitability" is organised by the CCTAFC. In this case, applicants do not have to hire a property administrator to prepare the documents and present them, but most of the petitioners will not know this advantage. After the verification of 8 documents, most of them forms, contracts and budget plans between the property owners and the chosen refurbishing companies, the CCTAFC produces a second suitability code (step 3). Both suitability approvals allow presenting the formal request of the subsidy at the City Council of Barcelona (step 4). The definitive grant application needs two more forms and after a thorough analysis the City Council will be able to release a favourable resolution (step 5).

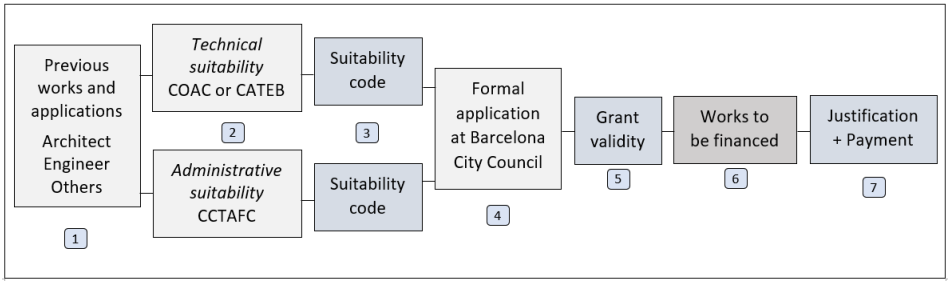

Figure 2: Standard sequence of steps to obtain a renovation grant for a building (Programme 3).

Source: Data adapted from the call of the Barcelona Housing Consortium (BDNS ref. 632786).

It should be noticed that the remunerations of the professionals that participate in this grant process are not covered unless the subsidy is accepted by the administration. Unfortunately, the payment will not be immediate; according to the grant call, only after the verification of the works (step 6) and the delivery of all the required documents, the Administration will order the imbursement of the subsidy (Barcelona Housing Consortium, 2023: art. 9.4) (step 7). The operation of other grant programmes in Catalonia is very similar to the exposed case.

5 Discussion and Conclusion

The present paper has analysed the bureaucracy behind the *NextGenerationEU* funds for renovating buildings in Spain, and particularly in Catalonia. Overall, the administrative apparatus created for the occasion is connected to inefficiencies, second-rate transparency and citizens' dissatisfaction. Our initial question, "Why NG funds for refurbishing buildings and dwellings in Catalonia are not solicited as expected?", can be answered now. It is because:

1. The management of the subsidy implies too many administrations and professional organisations, which are overlapping in tasks. Citizens do not know where to begin. It would have been much easier to concentrate all on the Catalonia Housing Agency.
2. The request of the subsidy obliges citizens to disburse the remuneration of architects, building engineers and other specialists, without knowing the application's success. Moreover, this is a symbolic step, as even if the grant is approved, the funds will come only after an exhaustive justification of the accomplished refurbishing works. Other regions have settled subsidy payments in advance. Their successes could be emulated.
3. Programme 4, more known as the grant "to change windows", only covers up to 40% of the costs, reaching a maximum of 3,000 euros. In other autonomous communities, the administrations have established other subsidies to complement the fraction, and thus numerous applications have been registered. Such policies could be replicated.

Further research can study the effects of eventual corrective policies during the 2023 budget.

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SUSTAINABLE ORGANISATIONS TO IMPLEMENT THE STRATEGIC CONCEPT OF SUSTAINABILITY

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Abstract Achieving the goals of sustainable development is only possible by representing the interests of all the organization's stakeholders. The purpose of the article is to show that for the competitive flourishing of the economy and the achievement of a just society, we must direct socio-economic trends to the concept of equal fulfilment of the interests of organizations and the economy, people and society, and nature and the natural environment. Using a qualitative methodological approach and limitation to a case study of a public organization, our research results showed that to implement such a concept of sustainability, we need sustainable organizations that are committed to sustainable development with a sustainable vision, mission, purpose, (fundamental) goals, strategic directions, and strategies.

Keywords:
sustainability, sustainable development, strategic management, organisation, social responsibility

JEL:
L21, L30, M14

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1 Introduction

The global environment and industry bring many opportunities to organisations. To take advantage of business opportunities, an organisation must consider different aspects of sustainable development and include them in its development guidelines. If the organisation's development is intended for sustainable development, the organisation's business operations will also be sustainable (Štrukelj et al., 2020; Wheelen et al., 2018).

In this research, we, therefore, started with the following research questions (RQs):
(RQ1): *What kind of organisation do we need to introduce a strategic concept of organisational sustainability?*

(RQ2): *Do we need sustainable governance of the organisation to introduce a strategic concept of organisational sustainability?*

From the knowledge of integral management (Belak et al., 2014; Belak and Duh, 2012; Štrukelj et al., 2017), it is clear that the governance and management process is superior to the business process, and therefore, we set the following research thesis (T):

(T1): Responsible organisation governance is a key starting point for the organisation's sustainable development and, therefore, to establish justification for a strategic concept of organisational sustainability.

The article is structured following the IMRaD structure, so the next section is dedicated to the theoretical background/literature review (section 2), followed by the methodology (section 3), then we present the research results from findings (section 4), and the article ends with a presentation of the discussion and conclusions (section 5).

2 Theoretical Background

Sustainable development is "*the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs*" (World Commission on Environment and Development, 1987).

The model of the UN (United Nations) SDGs (Sustainable Development Goals) (UN, 2015) tries to create social equality and economic certainty and equality for humans. These goals are part of the UN 2030 Agenda, which aims to ensure prosperity, end poverty and protect the planet by 2030.

We emphasise that the organisation is the key to achieving sustainability and the key link between both personal and social responsibility. We suggest setting up responsible management and the assimilation of sustainable development and social responsibility into the strategic development orientations of organisations, and, consequently, into their operations.

When working at the attainment of sustainable development within an organisation, it is, for that reason, required to begin from the micro aspect (personal), which by the mezzo aspect (organisation) affects the macro aspect (social, environmental and economic) (Štrukelj et al., 2020; 2022).

Reaching out towards sustainable development is more straightforward with partnerships, which is the 17th SDG of the UN. Three key forms of partnerships are (Dodds, 2016): (1) Multi-stakeholder partnerships – remarkable transformations, contributions and dedications to sustainable development; (2) Voluntary initiatives –individual non-compulsory commitments that to reach selected, well-defined outcomes for sustainable development; (3) Public-private partnerships –contractual arrangements between private and public sector agencies. They join forces and share knowledge and resources.

Organisations play an important part in guaranteeing sustainability, as shown in Chapter 4 (research) – the selected public and non-profit university is introduced. Universities are important partners in reaching the UN SDGs because they have a powerful, visible role among their stakeholders and are crucial partners in multi-stakeholder memberships. An important part of the longer-term, strategic directions of public and private universities is "reaching the strategic goals of sustainability".

3 Methodology

Various data collection methods were employed in the examination's conceptual part. The research and analysis of the fundamental studied literature were employed as a fundament in the empirical section.

In the conceptual part, descriptive methods. i.e. the comparative method, classification method, method of abstraction, method of induction and deduction were used (Ambrož et al., 2015; Ivanko, 2007). The Dialectical Theory of Systems (DTS) was also used, with interdependence and synergy of all necessary aspects taken into deliberation (Mulej et al., 2013).

In the practical part of the examination, the procedure of the case study technique (Dingsøyr et al., 2023) was used to help understand diverse circumstances and situations. For examining and explaining the case, publicly accessible data were used.

4 Research Results

In this chapter, sustainable management of universities is presented first to understand better a case study presented secondly.

The universities can help to reach the SDGs. They must go along with time, continuously change, meet up with local and global environment expectations and flexibly reply to the various stakeholder's demands. They impact the identification and visibility of necessary changes. With innovative, recently developed new understanding and knowledge as well as recent initiatives, universities help to solve problems and transform practice. They are initiators of future leaders (Hanieh et al., 2015; Knez-Riedl, 2006).

To fulfil the SDGs (UN, 2015), humanity must reach a sufficient amount of innovation, and this is why it is important to develop our values and foster needed competencies (UNESCO, 2020). To the universities, it is given the responsibility for a fundamental part in this development. Through their activities, universities impact the development of the community and national economy, society, and the global economy. Universities are an important link between crucial sustainable development areas, as they educate a profile of various stakeholders that will

stimulate their innovativeness and make communities stronger by adaptation, to support changes in contemporary and future development. Consequently, they have to be sustainable and need sustainable strategic management. From the aforementioned role of the university comes the significance of its integral management and the importance of establishing a strategic concept of sustainability. Universities must take knowledge of integral management into account in their (long-term, medium-term and short-term) development as well as operations (Belak et al., 2014; Štrukelj et al., 2017; 2020).

Today, a socially responsible and sustainable university is understood as an organisation that puts in use the concept of social responsibility and sustainable development in its education system, project activities, research activities, and development and operation (Glavič et al., 2012; Knez-Riedl, 2006), as is in the case of the university under study.

The initiatives for the sustainability of the University of Maribor started before nearly 20 years. In the beginning (Hrast, 2022), in the year 2005, they included sustainable concepts into the project of Glavič et al. (2012). The concept of social responsibility and sustainable development Council and Commission was presented in the year 2013. This content (University of Maribor, 2021) is also prominently included in the Strategy of the University of Maribor 2021–2030. They are developing innovative and interdependent university that practice responsible, critical and active students, guarantee high standards of education, research and projects, academic honesty work, and protect society. Especially they raise awareness towards upgrading communication among its stakeholders, to inform them regarding its different and numerous activities towards sustainability, as well as raise awareness among stakeholders about sustainable development and social responsibility. Of Slovenian universities (Hrast, 2022), only the University of Maribor was ranked in the Times Impact Ranking in 2021; it has been included yearly since then. In the QS Sustainable Universities 2023 ranking (QS, 2023), it was also acknowledged as a sustainable university. This year, for the first time, QS measured an aspect of sustainability: the institution's capability to tackle the most prominent social, environmental and governance challenges we are confronted with.

In the absence of internalising socially responsible and sustainable development, our society will not prosper, which became aware of by the University of Maribor management. They understand the importance of developing the strategic concept of sustainability realisation: to advance in a high-quality, responsible and successful manner. The university should be an organisation that includes socially responsible and sustainable activities in all aspects and for all stakeholders.

5 Discussion and Conclusion

Reaching the SDGs is nowadays very significant. Nowadays, society faces many challenges. Therefore, our civilisation must strengthen diversity with sustainability and (social, environmental, and economic) responsibility. Organisations like universities will play a crucial part in this because they significantly impact our society. Therefore, their development should be oriented towards sustainability, and our values should be accordingly changed.

Conducted examination confirmed the research questions "*What kind of organisation do we need to introduce a strategic concept of organisational sustainability?"* and "*Do we need sustainable governance of the organisation to introduce a strategic concept of organisational sustainability?*" positively. Introducing organisational sustainability through a strategic concept requires an organisation oriented towards sustainability and the SDGs (UN, 2015). A sustainable organisation takes into consideration the characteristics of a single human being, of the organisation and the society and economy. It should be aware of the characteristic of sustainability (Štrukelj et al., 2020; 2022; UN, 2015).

Different structures of partnerships applied by sustainable organisations' strategic concepts can notably contribute to SDGs achievement (Dodds, 2016). This is why organisations require sustainable governance (Belak et al., 2014; Štrukelj and Gajšt, 2019; Štrukelj et al., 2020; 2022; Wheelen et al., 2018). This research has confirmed the thesis set. We found that the responsible governance of the organisation is a key starting point for the organisation's sustainable development and, therefore, for a strategic concept of organisational sustainability. The integral management models (Belak & Duh, 2012) instruct that governance is higher-level than management In order to perform the concept of sustainability, we require sustainable-oriented organisations. To attain this, we need partnerships to achieve the SDGs – the 17th UN SDG (UN, 2015).

For further research, we propose exploring other organisations and their significance in partnerships for achieving the SDGs. It is meaningful to research the micro, i. e. personal sustainability; mezzo, i. e. organisational sustainability; and macro, i. e. economic sustainability.

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INTERNATIONAL TRADE IN WASTE: THE CASE OF CROATIA

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Abstract The aim of this paper is to analyse Croatia's international trade in waste, in terms of both export and import quantity, value, origin and destination. Data on trade in waste are available from Eurostat for the period 2004-2020. Results show that extra-EU trade in tonnes increased dramatically. Extra-EU export of waste increased for 3475% and extra-EU imports for 433% in the observed period. Intra-EU exports increased for 50% and intra-EU imports increased for 417%, especially after 2013. Intra-EU exports of waste are 3.45 times larger than extra-EU exports. Intra-EU imports are on average 1.76 times larger than extra-EU imports. Croatia's trade in waste is predominantly with other EU member states. In order to make national and global economy resilient to environmental changes and decrease material footprint, generation of waste followed by a trade in waste should be decreased by establishing and following responsible consumption and production patterns.

Keywords:
sustainable development, trade in waste, material footprint, Croatia, EU

JEL:
F18, F64, Q56

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1 Introduction

In today's economy waste has outgrown its locally generated problematics. Waste generated locally requires appropriate disposal techniques. Demand for waste disposal sites outgrows their supply, thereby presenting an environmental problem and pressuring waste generators to seek new waste disposal sites. Waste can be traded, as other goods and services, especially internationally. This paper looks into the Republic of Croatia's trade in waste to answer the question: *Where does Croatia dispose its waste? and Which countries dispose their waste into Croatia?*

The next section portrays the literature in the field of international trade in waste, after which it explains the used methodology and presents the results of the descriptive analysis. The paper finishes with conclusion and discussion.

2 Literature Review

Global consumption increased by more than 65% in the period 2000-2019 (the United Nations, 2022). An increase in the global consumption (demand) raises global production thereby raising the amount of generated waste. Eurostat (2023a) defines waste as "any material *which the holder disposes of or is required to dispose of pursuant to the provisions of national law in force*." Even in case of the appropriate disposal of waste, waste disposal causes environmental and health consequences. Landfills cause soil, water and biodiversity depletion, as well as air pollution. Herewith connected loss of biodiversity occurs globally. In that manner the United Nations addressed responsible consumption and production in the Sustainable Development Goal 12 (SDG12), closely relating to SDG 8 Economic growth and SDG 15 Life on Land, the protection and restoration of ecosystems and preservation of biodiversity. Table 1 depicts differences between developed, developing countries, EU-27 member states and Croatia in terms of income per capita, biocapacity, consumption and production ecological footprint and air pollution.

Global average in generated waste is 0.74 kg per capita per day, while the average for the Europe and Central Asia amounts to 1.18 kg per capita per day, and in Croatia 1.1 kg per capita per day of waste is generated (World Bank, 2018). In 2020 in Croatia, the greatest generators of waste by sectors are construction (23.8%), households (20.2%), waste/water (16.3%), mining and quarrying (11.6%), manufacturing (7.5%) and energy (1.1%) (Eurostat, 2023a). This section points out

that consumption generates large ecological footprint, even larger than production, and that ecological footprint, which measures the quantity of nature necessary to support people and their economies, is larger in developed economies as opposed to less developed ones. As economic growth is inseparable from consumption and production, and with intertwined waste generation and trade, this paper explains the importance of dealing with the topic of trade in waste and describes the waste trade flows from and into the Republic of Croatia in order to depict the underlying Croatian waste trade flows.

Table 1: Income shares, waste trade shares and socioeconomic differences by groups

	Developed countries	Developing countries	EU-27	Croatia
GDP per capita	42,539.9	1,061.9	32,828,5	15,166.4
Renewable energy consumption rate (%)	11.42	72.95	21.8	33.1
Biocapacity	2.7	1.0	2.7	2.8
Ecological footprint (production)	5.6	0.9	4.6	3.1
Ecological footprint (consumption)	6.0	1.1	6.1	3.9
CO2 emissions per capita	9.8	0.3	6.1	4.1
Share of world income	41.17	58.83	14.92	0.09

Source: Authors' compilation according to Kellenberg (2015) and World Economic Forum (2019) data. GDP per capita in constant US$ in 2021 (World Bank database, 2023). Share of world income based on GDP based on PPP (IMF, 2023). Biocapacity and ecological footprint for 2018 (Global Footprint Network, 2018). Share of energy from renewable resources from 2021 are available from Eurostat (2023b) for European union-27 and Croatia for 2021, and for developing and developed countries from the World Bank in 2015.

3 Methodology

This paper analyses Croatian international trade in waste in terms of exports and imports quantity, value, waste origin and destination in order to gain an understanding of Croatian waste in trade flows, namely: Where is the Croatian waste disposed and which countries dispose their waste into Croatia? Data for the analysis are extracted from the Eurostat (2023a) database. Eurostat database offers the data about trade in waste in the following manner: (a) quantity of trade in waste, (b) value of the trade in waste, and (c) the direction of waste in trade. This paper uses a

descriptive analysis of the data from the Eurostat database on waste and trade in waste to illustrate Croatian trade flows connected to trade in waste, and with it connected directions.

4 Results

This section illustrates the Republic of Croatia's trade in waste. Figure 1 illustrates total annual imports and exports in waste in tonnes and thousands of euros. Croatian exports of waste are larger than imports. However, both in terms of quantity and value, imports of waste show a tendency to increase exponentially, while an increase of waste exports seems to have slown down in the period 2004-2021.

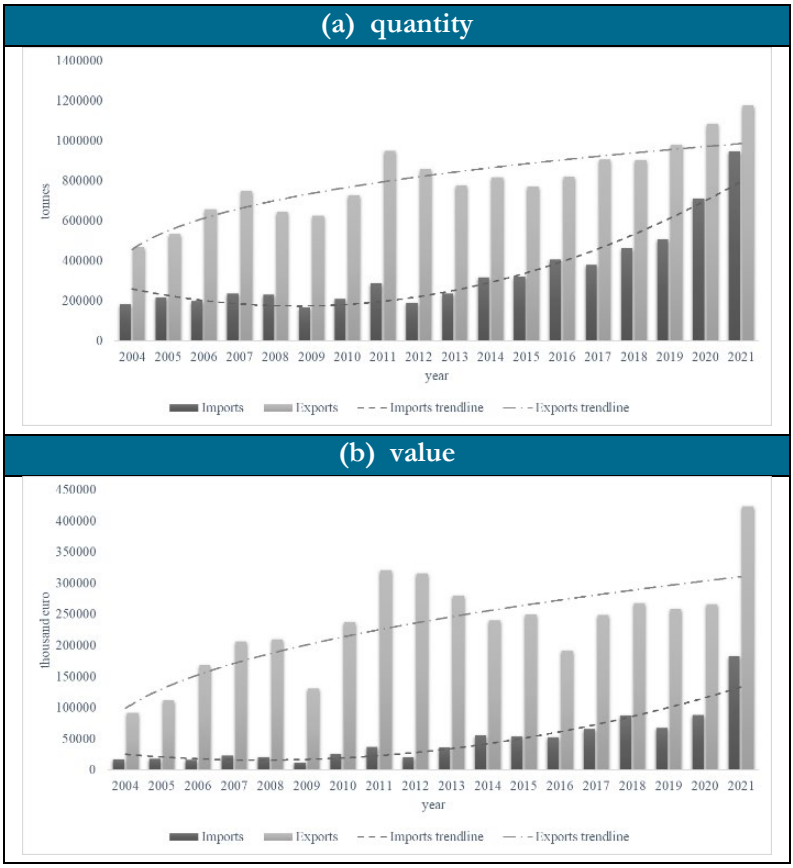


Figure 1: Imports and exports of waste in the Republic of Croatia
Source: Eurostat (2023a). Authors' representation.

Figure 2 shows the Republic of Croatia's imports of waste. The amount, in tonnes, and value of waste follow a similar pattern. It is interesting to note that waste imports from other EU-27 member states and from extra EU-27 were similar in quantity and value. However, after Croatia accessed into the European Union in 2013, imports in waste from other EU-27 member states increased drastically (417% in total in the period 2004-2021). Annual change in imports intra EU-27 was approximately 8% in the period 2004-2012 and increased to 33% in the period after the EU accession. The greatest increase in quantity was 113% in 2009-2010, followed by an increase of 76% in 2012-2013, 61% in 2013-2014 and 54% in 2019-2020 (Figure 4). An exponential increase in intra EU-27 imports is visible (Figure 2).

Intra EU-27 imports are on average 1.76 times larger than extra EU-27 imports. Extra EU-27 imports increased in total for 433%, amounting 13% annually, approximately 20% in the period 2004-2012 and increased to 8% in the period after the EU accession. The greatest annual increase was 72% in 2004-2005, 46% in 2007-2008 and 38% in 2017-2018. Figure 2 shows that both in terms of quantity and value intra EU-27 imports of waste show signs of exponential rise and extra EU-27 imports remain fairly constant compared to intra EU-27 imports.

Exports of waste show a somewhat different dynamic. Although intra EU-27 exports outstrip intra EU-27 exports in the entire observed period, extra EU-27 exports started to drastically increase after 2016. Extra EU-27 export of waste increased for staggering 3475% (27% annually on average). The largest increase was in the period 2004-2005 when extra EU-27 exports increased for 3,408%. Extra EU-27 exports increased annually for 27% on average in the period 2005-2012, and 12.5% annually on average in the period after the EU accession.

Intra EU-27 exports of waste are 3.45 times larger than extra-EU exports. Intra-EU exports increased for 50% (3% annually on average). In the period 2004-2012 intra EU-27 exports increased approximately 5% per annum, and approximately 1% per annum after the EU accession (Figure 3).

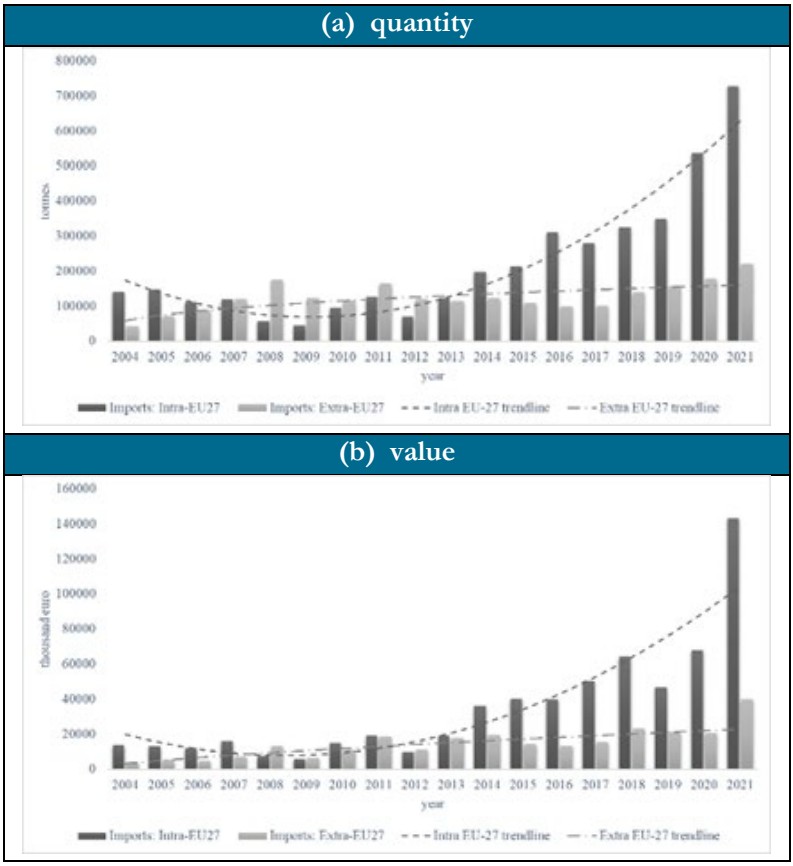
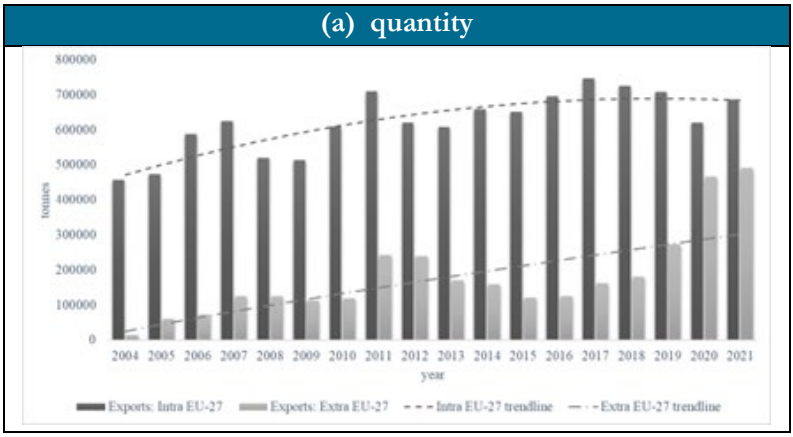


Figure 2: Imports of waste in the Republic of Croatia
Source: Eurostat (2023). Authors' representation.



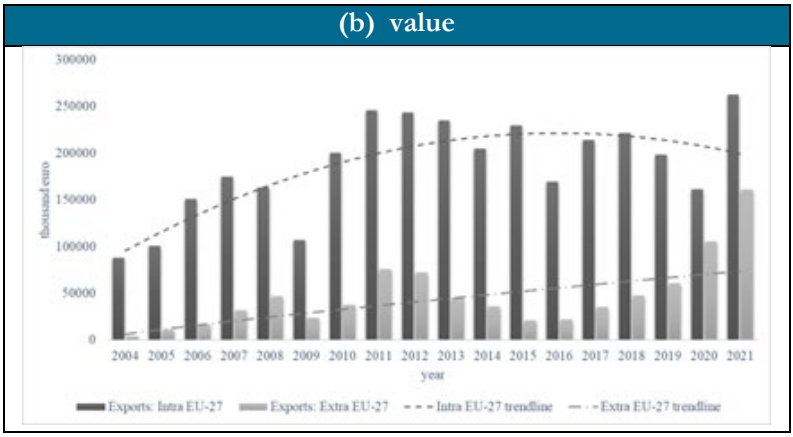


Figure 3: Exports of waste in the Republic of Croatia
Source: Eurostat (2023a). Authors' representation.

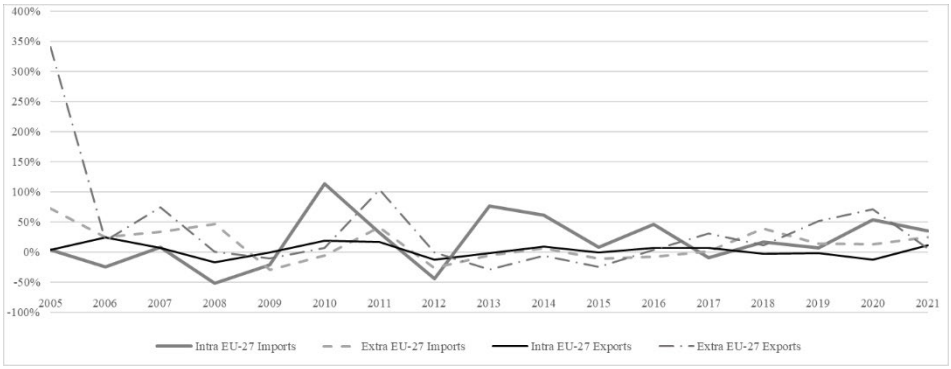


Figure 4: Percentage change in trade in waste
Source: Eurostat (2023a). Authors' representation.

Figure 4 shows the annual percentage change in intra and extra EU-27 imports and exports. The greatest positive change is evident in intra EU-27 imports increase, while the smallest oscillations in intra EU-27 exports.

Imports of waste from selected extra EU-27 countries and Greece shows that the structure of extra EU-27 imports has changed (Figure 5). Croatia imports majority of its extra EU-27 waste from Bosnia and Herzegovina (56% in 2004; 69% in 2021). However, in 2004 North Macedonia was the second largest exporter of waste into Croatia (29%), while in 2021 it is Serbia (23%).

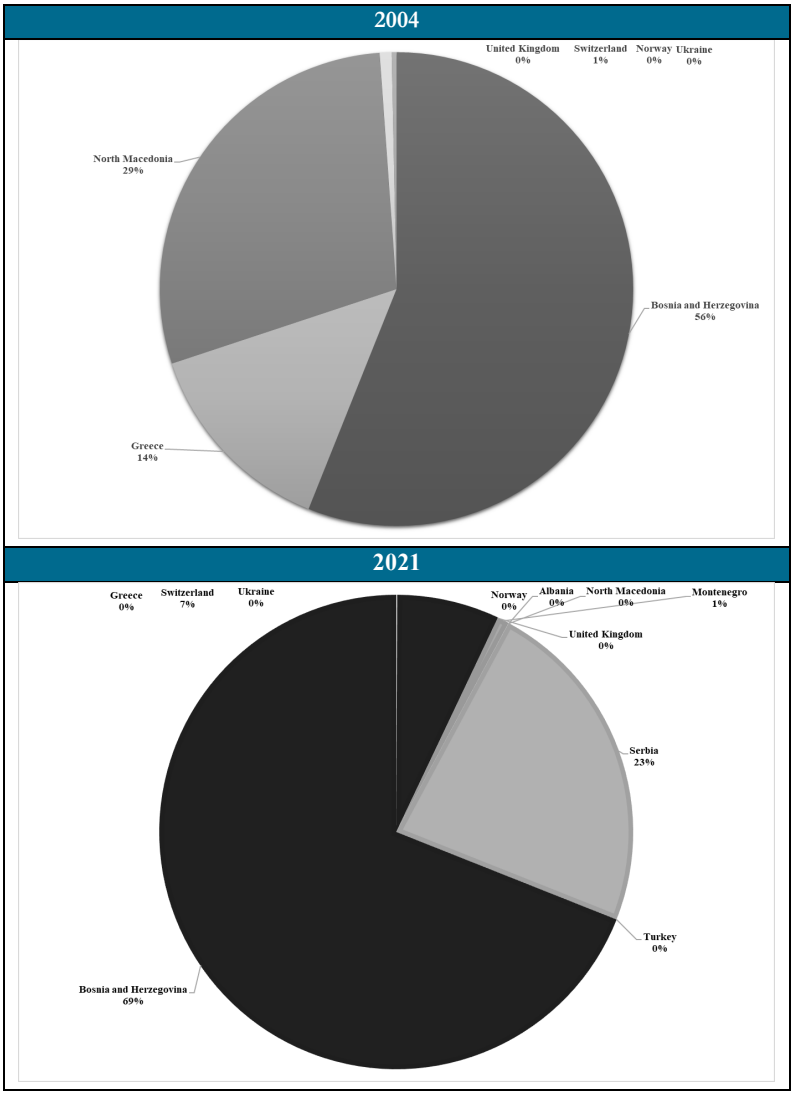


Figure 5: Imports of waste from selected extra EU-27 countries and Greece
Source: Eurostat (2023a). Authors' representation.

In terms of Croatia's structure of extra EU-27 exports and Greece, in 2004 the largest importer of Croatia's waste was Bosnia and Herzegovina (90%), while in 2021 it is Turkey (81%) (Figure 6).

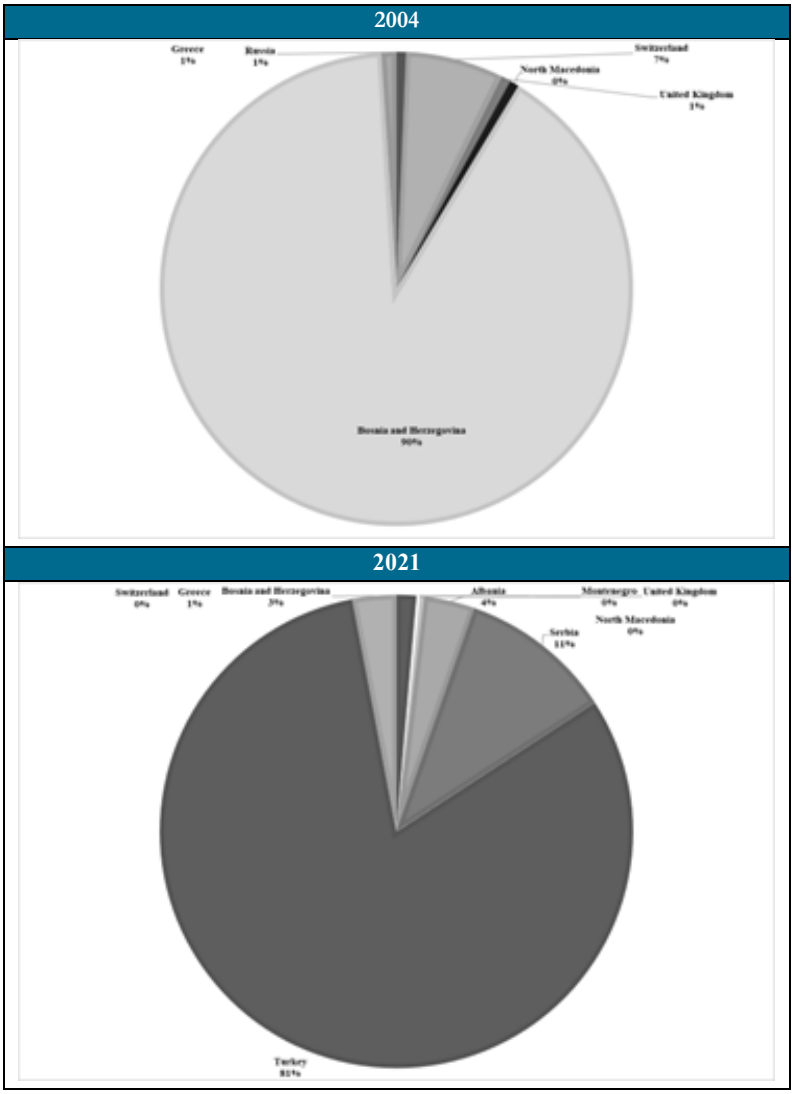


Figure 6: Exports of waste from selected extra EU-27 countries and Greece
Source: Eurostat (2023a). Authors' representation.

Figure 7 illustrates Croatia's terms of trade in waste, its material footprint and net exports, both in terms of quantity and value. Material footprint as a measure of raw materials required to meet final consumption demand is negative, thereby showing a positive tendency to decrease. Terms of trade in waste, as a ratio of export and import value, although positive point to a tendency to decrease, thereby showing an increase in import relative to export values.

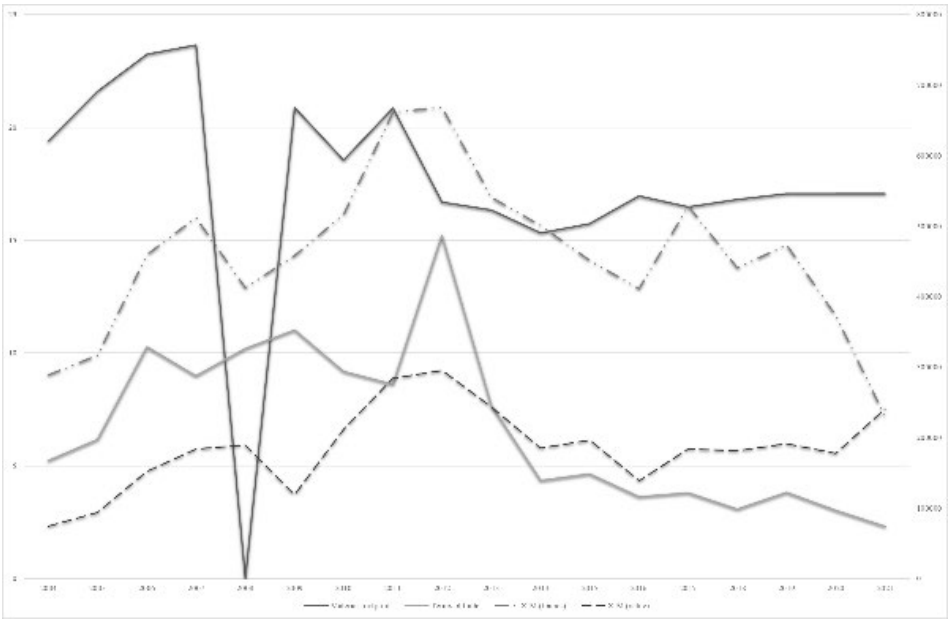


Figure 7: Terms of trade and material footprint
Source: Eurostat (2023a). Authors' representation.

Material footprint and Terms of trade (left axis). X-M (tonnes) and X-M (value) (right axis).

5 Conclusion

This paper attempted to portray a clearer picture of bi-directional trade in waste in and from the Republic of Croatia in order to answer the question: *Where is the Croatian waste disposed and which countries dispose their waste into Croatia?* In order to answer the question data on waste trade flows are retrieved from the Eurostat (2023a) database on waste. Data on the Croatian trade in waste show an exponential rise in waste imports, especially from EU-27 member states, and a decrease in rise in exports, especially to EU-27 member states. Additionally, Croatia's extra EU-27 exports are increasing whereby the destination of waste exports shows that larger amount of waste is sent to Turkey.

Future studies should look into the structure and hazardousness of imported and exported waste, examine the Croatian loss of biocapacity due to trade in waste, relate the trade in waste with the amount of consumption, production and with it connected amount of generated waste. Future studies should inspect whether Croatia has become the regional waste disposal or transfer site, and examine the impact of both on ecological and material footprint.

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INVESTIGATION INTO THE USE OF BIG DATA AND ANALYTICS IN GHANAS INSURANCE INDUSTRY

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Abstract This paper investigates how big data and analytics in Ghana's non-life insurance industry is being deployed. Although the deployment of big data and analytics is widespread in the global insurance space, little is known about its role in the decision-making process in Ghana's rapidly growing and highly competitive insurance market. The methodology is informed by the success of many large global insurance organizations in leveraging big data and analytics and through a mix of interviews and surveys. Qualitative research design underpinned by interpretivism was applied in this study to investigate the deployment of big data and analytics in Ghana's non-life insurance industry. The study reveals that Big data and analytics in Ghana are found to be still emerging and mostly limited to descriptive and reporting purposes, although some are found to be making important strides towards more advanced analytics usage. Big data in insurance can pave the way for AI and data driven decision making to be used to reduce insurance risk, increase food security, and enhance organisations adaptiveness to uncertain environments while improving climate resilience and promoting more sustainable cities and communities.

Keywords:
big data, analytics, insurance industry, sustainable development goals, Ghana

JEL:
Q01, O14

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1 Introduction

Discussions around the use of big data and analytics are prominent in advanced economies. However, little is known about the situation in the emerging digital markets in Sub-Saharan Africa. Within the African continent research on big data has focused on South Africa, which is considered more technologically advanced than most African nations (Sekli and De La Vega, 2021and Kruger et. al., 2014). Studies on big data and analytics use in Ghana have focused on its application in disciplines other than insurance. For example, Yeboah-Boateng and Nwolley's (2018) and Dzandu (2019) analyse its use in marketing whilst Awuah, et. al (2021) study focuses on public sector business. Ghana's non-life insurance industry and related regulatory initiatives to digitally transform the Ghanaian industry to drive insurance penetration, have not yet been studied and this is the research gap this paper aims to fill.

Therefore, the research questions this study will focus on is: how is big data and analytics being deployed in Ghana's non-life Insurance Industry? Big data can pave the way for AI and data driven decision making to be used to reduce insurance risk, increase food security, and enhance organisations adaptiveness to uncertain environments while improving climate resilience and promoting more sustainable cities and communities (Navarra, 2022). The next section will review the literature, followed by the methodology. Next, we discuss the findings followed by the conclusions.

2 Literature Review

In contrast to findings from Europe, America, and Asia, where big data and analytics is deployed out of necessity to remain competitive (Benfeldt et. al., 2020; Huang, 2019), Yeboah-Boateng and Nwolley's (2018) find that, the motivation to deploy big data and analytics across businesses in Ghana is dependent on the personality and biases of the organisations leadership.

Generally, Yeboah-Boateng and Nwolley's (2018) findings show that there is overall recognition of the importance, risks and demands of big data amongst various business stakeholders, thus, suggesting appreciable level of knowledge on the central role big data and analytics is taking at global level. Yeboah-Boateng and Nwolley's

(2018) study however focuses on Ghana's SME industry. Unlike Ghana's insurance industry, Ghana's SME industry is highly informal and characterised by low or non-existent corporate governance and small capital (Osei-Boateng and Ampratwum, 2011; Mintah and Darkwah, 2018). Given the differences in the characteristics of Ghana's SME sector and the insurance industry, it is perhaps hasty to assume findings from such a highly irregular sector represent the state of business operations in Ghana especially the non-life insurance industry which is much more capital intensive.

Afful et. al., (2018) provide a Ghanaian perspective on the concept of big data. They find that, until recently, companies in Ghana had failed to fully realise the usefulness of big data analytics, largely due to the lack of knowledge and limited penetration of supporting technologies. Their findings corroborate Dzandu (2019) key findings of a general lack of adequate know-how with the use of various analytics software/tools by employees. Afful et. al. (2018) also finds that, organisations in Ghana recognise that they possess valuable assets, capable of providing them with a wealth of knowledge to improve efficiency and productivity in their large data sets.

Ghana has great potential for employing big data and data analytics and is a heaven for tech businesses, with tech companies including Google and Twitter, opening offices locally. Ghana's insurance industry employs about 15,000 people, consists of 23 Insurance Companies, 90 Insurance Brokers, 5 Reinsurance Brokers, 4 Reinsurance Companies and over 6,000 tied and independent agents. Research results suggest that organisations are less mature in their analytics beyond reporting, and that heavy spreadsheet use may be holding back advanced insight generation to support business growth. Big data and analytics in Ghana is found to be still emerging and mostly limited to descriptive and reporting purposes.

3 Methodology

Qualitative methods underpinned by interpretivism was applied in this study to investigate the deployment of big data and analytics in Ghana's non-life insurance industry. The study further infers the preparedness of industry players to support the digital transformation agenda by the local regulator, against the premise that the strategic deployment of big data and analytics promotes business efficiency and supports growth.

By employing constructivism, the researcher draws on the flexibility of interpretivism to observe, document, and investigate subtilties of learners experience through interviews and surveys. This study deploys a non-probability sampling design, which combines the quota and purposive sampling techniques. The quota technique is used to collect data from participants touted to have a greater understanding of the phenomenon being studied. The purposive technique is used to collect qualitative data from executives. This mix is deemed critical to obtaining information rich data that represent the different realities experienced by different levels of employees in an organisations deployment of big data and analytics. 4 participants were selected for the qualitative methods part of this study. The sample size was guided by Creswell's (2013) guiding principle of not more than 4 or 5 participants in qualitative studies.

4 Results and Discussion

The study reveals that, delivering operational efficiency and executive management insight is the most important benefit sought from big data and analytics. From literature, analytics can improve the ability of users, to explore and customize views that are relevant to their analytical processes. These benefits are noted to lead to greater operational efficiencies hence, it is of little surprise that they rank highest in importance for many non-life insurance organisations in Ghana. For example, one executive made the following comment:

For us, data and analytics is supposed to support the bottom line. Our portfolio managers should be able to easily interact with information to diagnose the root cause of a situation and take corrective measures, preferably in real-time to improve performance or address customer concerns. since we started building dashboards with QLIK, we can consolidate information more easily to identify why a branch like Tamale was not performing.

These are the types of insights we expect to see across other workgroups with such programmes.

The study further finds that, analytics in most organisations, is used primarily to measure, track, and compare business performance against certain key performance indicators, including prior year performance. As such, investment in analytics is

seldom tailored towards predictive analytics as seen in more analytics mature environments like Europe, America, and South Africa.

A senior executive from a market leading insurer made the following comment:

The organisation is very much aware of the benefits of analytics, which is the reason why we are relentless with our plans to continue analytics development. To be honest, it is not as though we were not aware of the benefits associated with the use of analytics, the difference now is that we are pursuing various plans to collect customer data through our new CRM tool from the group.

This should give us greater information, especially when looking to develop products and pursing certain marketing angles.

Considering that a key characteristic of big data is its collation from various sources, one may ask if the data used in decision making in Ghana may even be considered as big data. Nonetheless, the reliance on a single data source, especially organisational data is found as a key reason as to why big data and analytics is being deployed in descriptive and reporting capacities. Organisations simply do not have access to the variety of data to discover subtle patterns capable of transforming their business models. For example, in budgeting and forecasting, external data is hardly considered. Essentially, the impact of external risk factors on the business is usually not adequately catered for.

Findings reveal that whilst integration of analytics with core business applications ranks high on the wish list of many organisations, they have simply not found enough success in this area to suggest imminent positive results in achieving data-oriented goals. According to findings the prevalence of legacy technologies which do not promote knowledge sharing is a major driver for the lack of success. It is perhaps little wonder as to why users find little success or satisfaction in their big data and analytics journeys.

Big data can bring several potential benefits, however research on their adoption in the case of the insurance industry in Ghana shows the risk of a potential clash between traditional and data driven models as the latter require customer feedback mostly ignored by the former. Lack of policies to support adoption of big data, AI & smart technology makes it difficult to attract investment opportunities in big data

infrastructure leading to a catch 22 situation where critical data gaps affect policy & KPIs delineation, performance, monitoring, and feedback to measure progress towards the achievement of Sustainable Development Goals (Navarra, 2022).

5 Conclusions

While this study acknowledges the significant developments around the topic of big data and analytics especially within the insurance space, it shows how different the story in Ghana's context is. The paper adds meaningfully to the body of literature on the progressive development of big data and Analytics in insurance, especially within the Sub-Saharan region. Data-driven insights has been a key difference maker between an organisations competitiveness and passiveness in the last few years, with greater influence expected going forward. Simple facts such as knowing about digital literacy levels within the boundaries of big data and analytics use, can be the basis for more assertive strategic decisions for business leaders, regulators, and investors with interest in Ghanaian and similar markets in consideration of Sustainable Development Goals.

Implications of the findings of the study include the following:

- The introduction of accessible executive training programs and data visualization tools to support data driven decision making should be integrated in insurance industry practice
- Data 'producers' should be involved while devising policies and incentives that acknowledge and incorporate feedback mechanisms based on well-conceived data structures and data analytics platforms that can then delineate KPI tracking policy progress and the achievement/localisation of SDGs

Achieving the above in tandem with policy coherence across a varied ecology of public and private organisations represents a significant research and practical challenge still to be fully investigated.

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MULTIDISCIPLINARITY AND INTERDISCIPLINARITY: KEY ELEMENTS FOR TEACHING ENVIRONMENTAL SUSTAINABILITY AT ECONOMIC AND BUSINESS FACULTIES

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Abstract The fact is that topics related to sustainable development are becoming an important integral part of curricula in economics and business higher education. However, the question arises how to include the field into educational practices, what competences and knowledge are required for different study courses (both to lecturers and students) and how to understand interdisciplinarity within different faculty departments. In this paper, we present 30 years of experiences of teaching sustainability topics with the emphasis on environment-related issues given by the members of the Department of technology and entrepreneurial protection at the Faculty of Economics and Business in Maribor. Several decades of experiences confirm that multi- and interdisciplinarity are one of the key features in the education of economics and business students due to the ever-increasing complexity of environmental issues that companies face in practice. In order to demonstrate the importance of multi- and interdisciplinarity in teaching environmental sustainability, we present two cases given in our current courses: carbon footprint calculation and evaluating of "greener" products with the application of software tools and databases (like Life Cycle Assessment tools).

Keywords:
sustainability, interdisciplinarity, teaching, higher education, carbon footprint

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I23, Q56

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1 Introduction

There has been a growing consensus that universities play a strategic role in the promotion of sustainability by creating relevant knowledge and its transfer to the society, and, secondly, by preparing their students for their future roles in the society where they will make sustainable and responsible decisions (Lozano et al., 2015; Figueiro & Raufflet, 2015; Blanco-Portela et al., 2017; Csillag et al., 2022). Several teaching techniques and didactical approaches were proposed on how to integrate sustainable development (SD) into higher education curricula (Figueiro & Raufflet, 2015; Barth & Rieckmann, 2012) and how to overcome barriers of such implementations (Naeem & Neal, 2012; Blanco-Portela et al., 2017; Csillag et al., 2022).

Integrating environmental sustainability topics into economics and business education raises several important questions such as which SD topics should be included into different study courses, how to relate such topics within the already existing courses, what the overall level of the sustainability knowledge of teaching staff is, and where lecturers get their environmental sustainability education and skills to be able to understand very complex environmental impacts interrelations, methodologies and tools.

In such efforts, the staff that lacks sustainability-related skills and has insufficient specialized knowledge of sustainability can be a problem because most academic staff in the past have never received training on the topic and do not feel comfortable to work across disciplinary areas on the topic of sustainability (Csillag et al., 2022). On the other hand, many academics have become "over-night experts", which is even worse. Naeem and Neal (2012) and Peña et al. (2018) reported that the most significant barriers to the integration of sustainability into the business curricula were associated with the lack of training of sustainability themes by most faculty members. Therefore, as emphasized by Lozano (2006), 'educating the educators' is an important element for promoting the incorporation of education for SD into universities, because a clear understanding of SD is necessary for the incorporation of the concept.

It is clear that the complex problems sustainability sciences are facing cannot be addressed sufficiently from a single-disciplinary perspective (Brudermann et al., 2019). Therefore, many authors agree that sustainable development and sustainability implementation require at least multi- and/or interdisciplinary approaches (if not more holistic ones). In such a way, it is possible to overcome too narrow and fragmented teaching in economics- and business-oriented faculties based on the management views only and which cannot embrace the complexity of environmental sustainability that companies face in business practice.

The aim of this paper is to reflect on how environmental sustainability topics as a part of wider SD goals can be addressed in the economics and business curricula by giving the example of the Faculty of Business and Economics at the University of Maribor, where the first courses that integrated environmental pollution and control problems in companies were already launched in 1970s, i.e. long before the importance of such topics was recognized as important in business-oriented schools curricula worldwide. Based on more than thirty years experiences in teaching and researching environmental sustainability issues, we present the importance of multi- and interdisciplinarity approach.

2 The Role of Multi- and Interdisciplinarity in Teaching Environmental Sustainability

Despite significant efforts in last decade and a half, higher education institutions are still far from solving complex SD problems in an interdisciplinary manner as confirmed by several authors partly because they are organized into highly specialized areas of knowledge and traditional disciplines.

Based on literature reports, Watson et al. (2013) observed that many higher education institutions curricula have relied on single-disciplinary specialization and reductionist thinking. As reported by Dlouhá et al. (2017) in a review paper for the case of Central European countries, single disciplinary-based SD courses are introduced without commensurate efforts to create an interdisciplinary or multidisciplinary dialogue. Furthermore, the disciplines may be too often focused on defending their own boundaries and resources (Darian-Smith & McCarty, 2016) what results in fragmented learning (Lambrechts et al., 2013).

Whereas in a single-disciplinary approach, a stand-alone course is taught with no ties to other courses, an interdisciplinary approach means the combination of knowledge of multiple established disciplines for solving specific issues (such as sustainability). In addition, a multidisciplinary approach consists of different fields of knowledge where each discipline retains its own method or theoretical concept and may be responsible for a different topic linked to the sustainability (Figueiro & Raufflet, 2015). Multidisciplinary approaches use the perspectives of a number of different disciplines with no necessary overlap. Interdisciplinary approaches use the methods and theories of one discipline to inform other disciplines (Darian-Smith & McCarty, 2016).

With regard to the study program, the study by Barth et al. (2007) showed that the competence for interdisciplinary cooperation appears to be central and urgently needed for teaching SD topics because personal and specialized knowledge is applied to new questions and problems in different combinations or disciplines and placed in an integrative perspective. However, learning processes which can enable such transformative changes largely depend on academic staff and their capabilities and willingness to support such processes (Barth & Rieckmann, 2012). Unfortunately, the complex structure of educational institutions may involve groups or individuals with diverse interests, which can hinder the process of SD interdisciplinary integration (Figueiro & Raufflet, 2015).

2.1 Environmental sustainability teaching at the Faculty of Economics and Business Maribor

Environmental sustainability and sustainability-related courses have been present in the contents of curricula at the Department of technology and entrepreneurial environment protection since the 1970s. Figure 1 shows the development of environmental and sustainability related contents in the courses given in terms of the share of the number of pages in textbooks written by professors in our department. Also, we develop, transform and upgrade the courses on a continuous basis. Some of the current courses are: Environmental management, Ecology of products, Sustainability of products, Technological and eco-innovation and others. A couple of courses are delivered together with the colleagues from other departments, like Environmental economics and environmental management and Sustainability accounting.

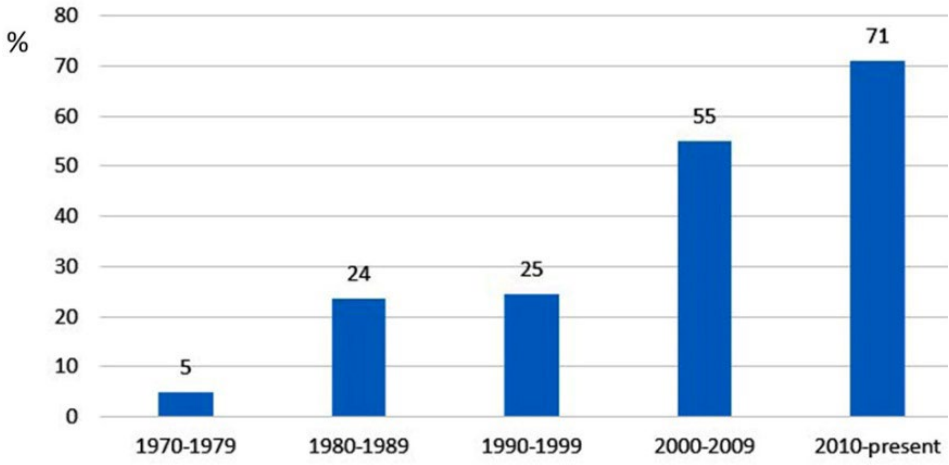

Figure 1: Development of environmental and sustainability related contents in the courses given at the Department of technology and entrepreneurial environment protection
Source: Authors' elaboration.

In the continuation, we present two examples of environmental sustainability topics that are included in the study courses and in the research work of the Department of technology and entrepreneurial environment protection and that are based on the engineering-oriented approach of modelling and calculations of environmental impacts: product carbon footprint (CF) and Life Cycle Assessment (LCA).

3 Case Studies of multidisciplinarity Related to Environmental Sustainability

The case study research methodology was used to demonstrate multi- and interdisciplinarity in the implementation of environmental sustainability topics in economic and business-oriented schools.

The relevant environmental data are the basis for any environmental policy. To determine the impact of processes and products on the environment, they must be calculated accurately. Different methodologies are used for such calculations supported by special software tools and comprehensive databases. Two of such methods are carbon footprint (CF) and Life Cycle Assessment (LCA). Both tools originate from engineering-based calculation procedures and standards and require

knowledge on modelling complex product life cycles which is impossible without expert knowledge of technological processes, energy and mass flows, raw materials, materials, energy conversions, etc.

If companies want to implement a greenhouse gases (GHG) reduction strategy and if they want to declare their products as more environmentally friendly, the results obtained from CF and LCA calculations are crucial. Data obtained by CF and LCA calculations are nowadays widely used in research and development, environmental management, marketing and supply chain management etc. However, management and marketing decisions and claims cannot take place without data obtained by such methods. Moreover, the interpretation and contextualization of such data cannot be successful without knowing the background of data determination.

To understand environmental impacts of a company or a product, the understanding of various environmental categories is necessary, which is based on natural sciences. Secondly, both methods, although widely used, have several methodological shortcomings that needs to be taken into account when interpreting the results and setting the decision-making priorities (Radonjič, 2015). In addition, if one really wants to understand the CF concept, the concept needs to be placed in the wider context of environmental sustainability, which means comparing it with other environmental impacts and methods.

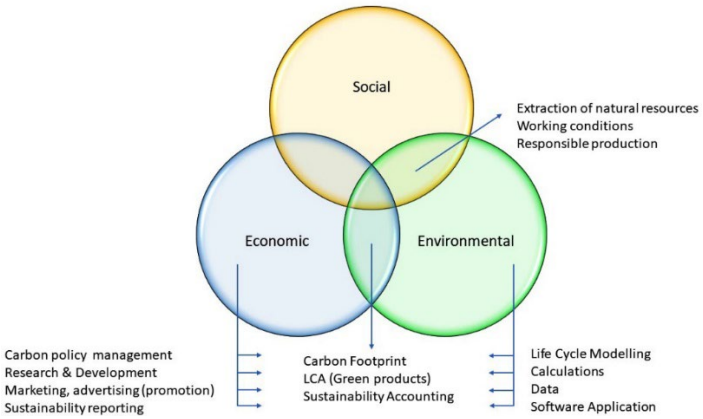

Figure 2: Connections between environmental engineering and business/management topics within the SD framework

Source: Authors' elaboration.

Due to these reasons, CF and LCA are good examples for studying multi- and interdisciplinarity in business practice, as they combine both engineering and management approaches of environmental sustainability. Figure 2 shows some examples of interdisciplinary interwining of these fields within the SD framework.

3.1 Carbon footprint calculation procedure

Although widely used in business decisions nowadays, CF is an environmental parameter based on a special engineering- oriented calculation procedure defined by standardized methodology to quantify GHG emissions. There are two main CF types: the product CF and the organizational CF. After CF determination, the obtained data can be used to establish carbon policy in companies, including goal setting for GHG reduction, for sustainable reporting and for the detecting the most contributing sources of GHG emissions along supply chains. CF can be calculated by different calculation methods, resulting in different final values; therefore, calculations require expert knowledge. This also includes the knowledge on energy sources, their calorific values, heat and energy consumption, special conversion factors for single energy sources and selection criteria on global warming potentials.

Several GHGs exist with completely different emission sources. In case of CO_2 related emissions, the energy consumption data are collected and converted to CO_2 emissions by multiplying it with special emission factors (equation 1). In order to do this, selection of relevant emission factors must follow energy conversion characteristics of different fossil fuels and related energy technologies, CF standards guidelines and/or data from national energy operators.

$$\text{GHG emissions} = \Sigma\ (AD_i \times EF_i) \tag{1}$$

where AD_i represent activity data from source i (based on a unit of measurement), and EF_i is emission factor for source i (kg CO_2/unit of measurement). When dealing with the quantities of fuels, expressed in tonnes and/or m^3, net calorific values has to be used to calculate the amount of energy per tonne or m^3.

To calculate a CF, emission quantities of individual GHGs have to be converted to so-called carbon dioxide equivalents (CO_2eq) using Global Warming Potentials (GWP_i) values (equation 2). That allows different GHGs to be compared on a basis

relative to one unit of CO_2. Measuring the comparative impact of different GHG is further complicated by the fact that different GHGs vary both in the greenhouse effect intensity in atmosphere and how long they remain in atmosphere. Therefore, GWP_i factors must be carefully selected, since they are available for different time horizons (20 years, 100 years and 500 years).

$$CF\ (CO_2eq) = \Sigma\ ((GHG\ emissions)_i \times GWP_i) \quad (2)$$

In addition, biogenic carbon uptake (CO_2 removed from the atmosphere) has to be included as well. Finaly, the CF result represents a sum of particular GHG emissions (expressed as CO_2eq), reduced for biogenic carbon uptake (equation 3).

$$CF\ (CO_2eq) = \Sigma\ ((GHG\ emissions)_i \times GWP_i) - CO_2eq\ biogenic \quad (3)$$

For product CF calculation, life cycle of product must be modelled first on a basis of engineering principles of mass and energy flows, backed by the application of special software tools. However, calculating CF has a limited practical value if we do not have an indication of which processes contribute most to such a result. This kind of indication can easily be given by special software tools, linked to verified environmental databases.

3.2 Using LCA methodology in defining 'green' products

LCA is a complex analytical method that determines the impacts of products throughout their life cycles, covering the extraction of raw materials and energy resources, the production of materials, chemicals and energy, the production of intermediate products, products and by-products, transport and distribution, impacts during use and after disposal. The LCA method quantifies mass and energy flows and links them to different environmental and health impacts. It can include up to 22 environmental categories, including carbon footprint. The results of an LCA help to identify how different products differ in terms of their environmental impacts, which are the most impactful stages in the product life cycle, which environmental impacts are most problematic and how a change in one part of the life cycle affects the other phases. Thus, LCA is known for its intensive contribution to better decision making which qualifies it as one of the most distinguished tools for products eco-design of products and strategic decision-making regarding

products development and marketing. LCA results represent the information basis for decisions whether a certain product is more environmentally friendly or not. Without LCA calculations such decisions are not relevant and can lead to greenwashing when comparing products.

As an example of LCA analysis, we show the application of LCA using the SimaPro software for double-layer laminated packaging produced from low-density polyethylene and polyamide used in the food industry for vacuum or modified atmosphere packaging. Methodological and data details of the study can be found in (Denac & Radonjič, 2019). The SimaPro software tool, supported by comprehensive environmental databases was used which enables the results to be presented in a wide range of graphics and formats (Figure 3). From Figure 3, we can detect which packaging's life cycle phases contribute the most serious environmental impacts.

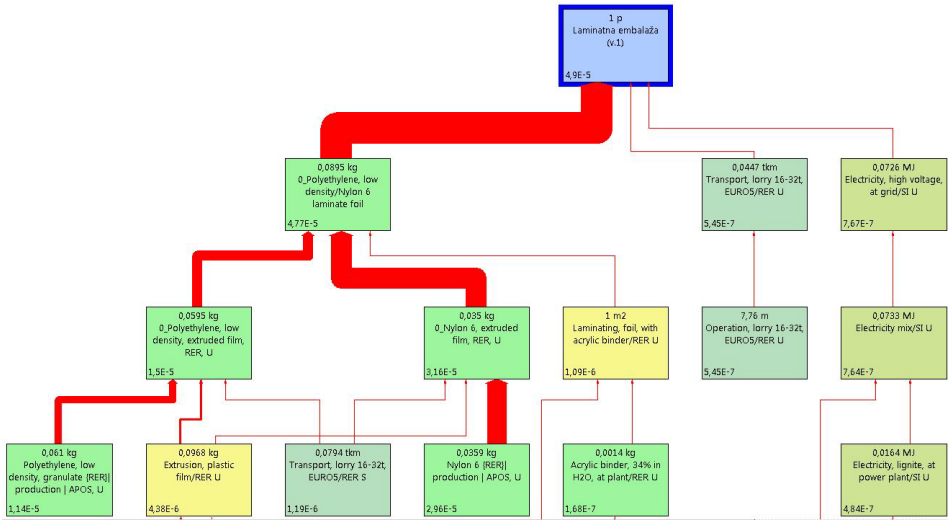

Figure 3: LCA graphical presentation of the environmental impacts calculated by SimaPro software of the laminate packaging (based on ReCiPe calculation method)
Source: Authors' elaboration.

4 Discussion and Conclusions

This paper reflects the need to move beyond the single-discipline/interdisciplinary divide. It raises the awareness that multi- and interdisciplinary approaches to sustainability teaching within and among different courses at the economics and

business higher education institutions is required in order to achieve a correct understanding of environmental problems in business practices. Namely, very often environmental topics related to business practices require an understanding of natural sciences phenomena or engineering-oriented calculations to deal with proper contextualization and implementation. In order to obtain necessary quantitative data on which a company's effective environmental policy is based, calculation procedures and modelling of complex products life cycles are required based on engineering principles.

One of the reasons why there are so many examples of greenwashing in business practice is the insufficient knowledge of marketing and management staff about determining the overall life cycle effects of products on the natural environment and human health. Engineering-like modelling and use of modern tools and software are necessary to support marketing and management decisions with relevant data.

However, it has to be emphasized that even interdisciplinarity in the sense of combining knowledge from different academic disciplines is still insufficient for tackling complex real-world problems. More holistic approach is necessary to attain the transition to a more sustainable economy serving all three SD pillars: environmental, social and economic. Although this paper is limited on environmental dimension of SD, multi- and interdisciplinarity approach is essential for social/environmental and social/economic interactions, too.

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ADOPTION OF SUSTAINABLE TECHNOLOGIES IN SMART CITIES: A GOVERNANCE FRAMEWORK

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Abstract This research presents a literature review on sustainable technologies and smart city governance models and a primary study on people's feedback on the adoption of sustainable technologies in smart cities. Based on the gaps in the available literature and the responses of the study of 100 participants, this research introduces a governance framework to be considered for the adoption of sustainable technologies in the smart cities context. During this research, a survey has been conducted for participants from the information and communication industry to reflect on the main aspects of sustainable technologies, applications, and priorities, link with the United Nations' Sustainable Development agenda. Outcomes of the survey along with an expert interview came to conclude that sustainable technologies should include multiple aspects such as mobility, infrastructure, government, economy, living style, environment, safety, and data privacy. Sustainable technologies are considered as a new life vehicle that can drive not only the application of the technology itself but also human behaviour. The research proposes a Governance Framework practitioners may leverage to classify sustainable technologies in smart cities' context and define more governing parameters for adopting sustainable technologies.

Keywords: sustainable technologies, governance, smart cities, sustainable development, AI

JEL: Q01, O14

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1 Introduction

Sustainable technologies have been actively utilized in cities to enhance their "smartness". Smart cities are gaining increasing recognition and are meant to be technologically managed urban spaces that leverage technologies to create a better world for citizens (Dameri et al., 2014). Some examples include computational technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), Blockchain, Big Data, Cloud Computing, and Virtual and Augmented reality. Therefore, these emerging technologies contribute vastly towards sustainable development (Rani et al., 2021).

Therefore, to expand on the application of sustainable technologies in smart cities, this research aims to answer the following question: what is the relevant governance framework that may be used to adopt sustainable technologies in the smart cities context? The research targets specified objectives that can be achieved through fundamental questions and are discussed below.

2 Theoretical Background

2.1 Research theoretical framework

To enrich the perspective shown by Activity Theory, the System Dynamics Theory, demonstrates the movement and interaction of different aspects of Smart Cities (Figure 1; Das, 2013). These six aspects – smart people, economy, living, environment, mobility and governance are all interconnected and affect each other. This understanding fit greatly as a visual demonstration of sustainable technology, its users and all the actors within smart and sustainable cities across the globe.

The System dynamics model (Figure 1) showcases that different aspects of the subject are intertwined and co-dependent (Sirovs, 2022, Navarra and Bianchi, 2013a; Navarra and Bianchi, 2013b). Each aspect creates a loop, and each of the loops interconnects with each other, affecting the others. In the case of the Smart City, the research aims to identify how the governance framework can facilitate the adoption of sustainable technologies in the smart cities while fulfilling SDG11, and therefore intercombination of understanding the activity theory and the system dynamic theory, the outcome of the dissertation can be achieved.

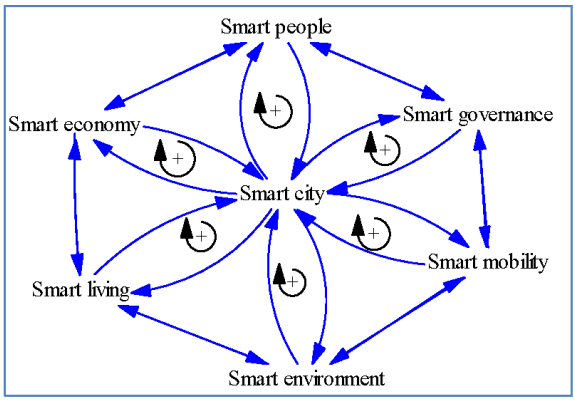

Figure 1: Systems Dynamics Model for Smart Cities
Source: Das (2013).

Sustainable Technologies (object, as per Activity Theory), are utilised across all six pillars and are a variable input to the system of the smart city as a whole. As sustainable technologies are applied by smart cities' technology users (subjects), this enhances smart living through citizen utilisation, increased quality of life and safety, health and well-being as well as housing quality. For instance, sustainable technologies such as smart lighting systems can optimise the energy consumption of electricity per living unit if made more widely accessible.

2.2 Introduction to Sustainable Development Goals

The Sustainable Development Goals (SDGs) were first introduced by the United Nations in 2015 and are supposed to be accomplished by 2030 (United Nations DESA, 2022; United Nations, 2015). In total, seventeen SDGs were developed (Wu et al., 2018).

2.3 Economic impact of sustainable technologies

According to Levi-Jaksic et al. (2018) and Stritch et al. (2018), the impact of sustainable technologies on economic welfare may result in the arrival of the concept known as a circular economy. This concept showcases the production of reusable resources through the transformation of waste, thus creating a circular flow of economic activities rather than linear hence regeneration concept is emphasised

rather than having "end of the lifecycle" (Sempels and Hoffman, 2013; Andersen, 2007). According to United Nations DESA (2022) Wu et al. (2018) and United Nations (2015) if SDGs 1,2,3,8 and 9 are achieved by 2030, the reduction in poverty, hunger, accessibility of good health and well-being, availability of decent work along with stable economic growth.

2.4 Existing smart cities governance frameworks

The balance between all aspects of the smart city can only be achieved with strong data governance established, carefully planned and implemented. Therefore, as the smart city layers must be tackled simultaneously to achieve a sustainable impact, which is in alignment with the SGD11 Goal, various sustainable data-driven initiatives are applied.

One example of technology governance in smart cities includes real-time and interactive data visualisation and cities analytics via cities' dashboards, which can give great insight into what aspect requires attention on priority (Wang & Shirowzhan, 2022). For example, if road infrastructure is overcrowded (such as in the Case of the City of London) (Bibri et al., 2020), the city introduced smart mobility solutions by applying IoT to optimise the traffic and encourage the mindset of usage of public transportation (Wang & Shirowzhan, 2022). On the other hand, the increase in mobility solutions will enable more population to move to urban areas, causing cities to expand or overcrowd yet again. This example highlights the multidimensional complexity and challenge of achieving sustainability (Navarra & Osu, 2021).

Table 1: Top 10 Smart Cities in the world.

Smart City Rank 2021	City	Smart City Rating 2021	Structure 2021	Technology 2021	Smart City Rank 2020	Change
1	Singapore	AAA	AAA	AAA	1	—
2	Zurich	AA	AAA	A	3	▲ +1
3	Oslo	AA	AAA	A	5	▲ +2
4	Taipei City	A	A	A	8	▲ +4
5	Lausanne	A	AAA	A	NEW	—
6	Helsinki	A	AA	A	2	▼ -4
7	Copenhagen	A	AA	A	6	▼ -1
8	Geneva	A	AA	A	7	▼ -1
9	Auckland	A	A	A	4	▼ -5
10	Bilbao	BBB	A	BBB	24	▲ +14

(Bris et al., 2021)

However, the top 3 ranked smart cities that most closely achieved success in establishing smart living, environment, people, economy, mobility and governance are Singapore, Zurich and Olso (ranked 1 to 3 respectively) (Bris et al., 2021, Table 1). These cities are ranked highest in the efficiency of structure as well as the use of technology.

2.5 Data governance framework by Navarra and Osu (2022)

There are various data governance frameworks have been introduced to the literature in this century (Al-Badi et al., 2018; Abraham & Schneider, 2019). However, as the concept of big data has been introduced, updated big data governance frameworks have been established. For example, Navarra and Osu (2022), have introduced a five-pillar framework which covers the data types, data process, protection, technology, applications and target audience. It showcases that the data governance framework is multidirectional and requires an interconnected approach when applying it in the smart cities environment (see Figure 2).

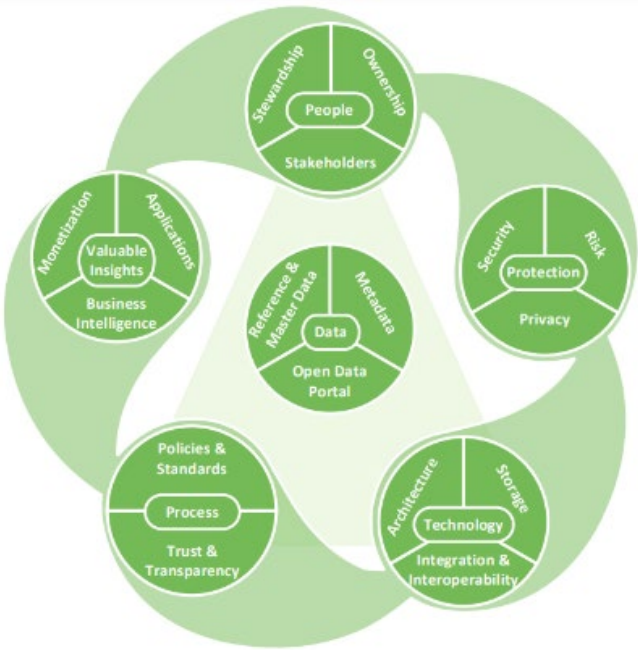

Figure 2: Data governance framework
Source: Navarra and Osu (2022).

3 Methodology

The study's research design evolves from the underlying research philosophies or positions and directly impacts the methodology described later. The primary data is mainly collected through the survey with the voluntary research participants. The survey is to be completed by a sample of 120 participants, who access the survey online through multiple channels such as LinkedIn and WhatsApp groups. The selected participants are working in the Information and Communication Technology Industry (ICT). However, there is an aim to target technology professionals, sustainable development practitioners, smart cities professionals, researchers and Subject Matter Experts (SMEs). The duration of questionnaire takes 10 minutes to complete and includes the relevant questions to achieve the research objectives. Additionally, secondary research has also been undertaken. The essential data to answer the research questions will be obtained by examining scholarly articles, research papers, government websites, business magazines, technology vendors' websites, and international organisations' publications.

4 Results

The primary research conducted via survey has demonstrated that the most important Sustainable Technology application in the future cities is by far the electric vehicles and mobility solutions. This showcases that almost half (49%) of the surveyed population sees a greater impact from this technology solution rather than sustainable energy, smart gadgets and waste recycling. Following Electric Vehicles (EVs), 27% of the participants showed solar panels as the second most important application of sustainable technologies. These indicators may inspire one important dimension to classify any technology application as "sustainable" based on the environmental impact, and demonstrate the criticality of mobility as one of the 6 pillars of sustainable cities (Das, 2013). According to the survey, half of the respondents reported that smart mobility was the most impactful technology that can improve citizen's life and will contribute to sustainable societies, while AI-based citizen services and digital assistants came in the second rank for the same. This leads to the conclusion that mobility and eco-friendly technology applications are perceived as the main criteria for sustainable societies, which correlates with the earlier perception of sustainable technology applications, which corresponds with existing research (Wang & Shirowzhan, 2022). According to the survey, 42% of the

respondents believed that using technology to ensure safety for citizens believe is having the highest impact to accelerate the United Nation Sustainable Development Goal (UNSDG) agendas.

4.1 A proposed governance framework

Based on the above research inputs, comprehensive governing aspects should come all together to formulate a collective of the main parameters to classify a "Sustainable Technology" within the context of Smart Cities. In Figure 3, the research tried to address the following aspects: mobility, infrastructure, government, economy, living style, environment, safety, and data privacy.

Figure 3: The proposed Sustainable Technology Governance Framework for Smart Cities
Source: Authors' elaboration.

Though this proposed framework represents collective criteria for the governance framework to classify sustainable technologies in smart cities' context, it is highly recommended that researchers seek further enrichment and share more thoughts on the guidelines on specific technologies or applications, as well as the implementation of it within smart cities.

5 Discussion and Conclusion

In conclusion of this studying, a wider perspective has been presented to show the importance of adopting sustainable technologies and how the governance framework developed may be used to regulate their adoption. Recommendations for further research include considering future aspects such as: (a) involving non-technology industry practitioners, such as development practitioners, sustainability professionals and also sociologists, as this may give a deeper and holistic understanding of the sustainable technology term, (b) considering sample from different development levels: the economic maturity may influence the participants' responses from the various economic background (developed, developing, and underdeveloped countries), and (c) Considering some qualitative and quantitative indicators to realize the governance framework application. While this research presents an open eye on sustainable technologies and adoption in smart cities, a limitation of this research is that it is still relatively ambiguous and uncertain what the future holds and how the human-behaviour will be shaped accordingly.

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POST CSRD WORLD: PROSPECTIVE AMENDMENTS TO SLOVENIAN LEGISLATION IN THE FIELD OF AUDITING

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Abstract The European Union adopted the Corporate Sustainability Reporting Directive (2022/2464/EU). The CSRD amends, among others, the Auditing Directive (2006/43/EC with amendments) in the light of establishing the European Union's cornerstone rules in relation to the assurance of sustainability reporting of entities. The CSRD's provisions mirror existing provisions concerning auditing for sustainability assurance to ensure consistent rules in the field. Nevertheless, there remain dilemmas, especially in the forthcoming transitional period. These are dilemmas that are systemic. For example, who will be capable of doing sustainability assurance engagements, which pronouncements in relation to sustainability assurance should be used, who should prepare them, what architecture should be established for education and training, by who, oversight dilemmas, etc. Our paper aims to present the CSRD's provisions in relation to sustainability assurance and interlinked dilemmas. Slovenia will need to implement the CSRD's provisions in relation to auditing into its legislation.

Keywords: assurance, audit, sustainability, Corporate Sustainability Reporting Directive, Slovenia

JEL: M14, M42, M48

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1 Introduction

The European Union adopted the Corporate Sustainability Reporting Directive (2022/2464/EU; hereafter: CSRD) in 2022. The CSRD impacts organisations and the EU's member states in various ways (i.e., risk and compliance, auditing, human resources, finance and treasury, investor relations, etc.). The CSRD amends, among others, the Auditing Directive (Directive 2006/43/EC with amendments) in the light of establishing the European Union's (EU) cornerstone rules in relation to the assurance of annual and consolidated sustainability reporting of entities. Sustainability information assurance engagement is set to be one of the main pillars to achieving the EU's strategic goals in relation to sustainability (i.e., climate-neutral economy and area, achieving a sustainable world, eradicating poverty, etc.). Assurance engagement is meant to be a mechanism that eliminates the information asymmetry problem regarding the credibility of entities' sustainability information and reports. Until now, there have not been any legislative pronouncements in relation to assurance on sustainability reporting. The CSRD acknowledges this fact. Nevertheless, in the field of auditing, the IFAC's International Auditing and Assurance Standards Board (IAASB) has for years been active in this area as the landscape has continued to evolve. Additionally, in the field of auditing, there is some research regarding sustainability information assurance engagement (for example, see O'Dwyer, 2011; Gillet-Monjarret, 2015; Farooq & de Villiers, 2017; Channuntapipat et al., 2020; Hazaea et al., 2022; Hsiao et al., 2022).

The CSRD puts legislative provisions regarding sustainability information assurance engagement in place. In short, CSRD's provisions mirror existing provisions concerning auditing for sustainability assurance to ensure consistent rules in the field. Our paper aims to present the CSRD's provisions in relation to sustainability information assurance engagement and interlinked dilemmas. Slovenia will need to implement the CSRD's provisions in relation to auditing into its legislation. It can be expected that the Companies Act (in Slovene: Zakon o gospodarskih družbah, ZGD-1) and the Auditing Act (in Slovene: Zakon o revidiranju, ZRev-2) will be amended in 2023–2024. Prospective amendments are expected to gradually assist in building more nationally sustainable businesses and economy in the long term. Our paper briefly presents a few prospective amendments, which are the most important. Only some prospective amendments are presented. Therefore, our paper is not comprehensive regarding sustainability information assurance engagement and all

interlinked dilemmas that will influence prospective amendments of the Auditing Act and the Companies Act.

2 The CSRD Directive Puts Light Onto the Auditing Profession

As previously stated, the CSRD puts legislative provisions regarding sustainability information assurance engagement in place. The International Federation of Accountants (IFAC), in their framework, defines assurance engagement as an engagement in which a practitioner expresses a conclusion designed to enhance the degree of confidence of the intended users other than the responsible party about the outcome of the evaluation or measurement of a subject matter against criteria. The CSRD follows this idea (with the use of different terminology). The CSRD's sustainability information assurance engagement is an engagement in which the statutory auditor (a practitioner) expresses an opinion (a conclusion) designed to ensure credibility (to enhance the degree of confidence of the intended users) about the sustainability information or report (the subject of assurance engagement) against the European Sustainability Reporting Standards (the criteria). With sustainability assurance entities obtain legitimacy (O'Dwyer, 2011; Gillet-Monjarret, 2015). Additionally, a practitioner's conclusion helps ensure the connectivity between the entity's financial and sustainability information.

To following briefly outlines the main ideas in the CSRD regarding sustainability information assurance engagement. Sustainability information assurance engagement is mandatory from 2025 for the 2024 year-end sustainability reports. A practitioner that conducts an engagement must be an independent third-party practitioner. First, limited assurance engagement is put in place. Second, if eligible, the CSRD foresees a reasonable assurance engagement will follow limited assurance. This will require, in an assurance engagement, the conduct, assessment and verification processes similar to auditing processes for the sustainability information. Besides the difference in the level of assurance, the difference between limited and reasonable assurance engagements is in the practitioner's work and form of expressed conclusion (i.e., a negative form of assurance in the limited assurance engagement and a positive form of assurance in the reasonable assurance engagement). Sustainability assurance engagement differs from financial statements auditing. Nevertheless, the CSRD Directive stipulates that the statutory auditor of

the entity's financial statements is allowed to provide sustainability information assurance.

Nevertheless, there remain dilemmas in relation to assurance engagements in the field of sustainability reporting, especially in the forthcoming transitional period. These are systemic dilemmas. For example, who will be capable of doing sustainability assurance engagements (i.e., a person with a high level of technical and specialised expertise in the field of sustainability), which pronouncements in relation to sustainability assurance should be used, who should prepare them (i.e., who has the capabilities to prepare such pronouncements) what architecture should be established for education and training, by who, oversight dilemmas, etc. The following section presents the current state and a few prospective amendments to the Slovenian auditing pronouncements. The prospective amendments deal with the dilemmas in relation to sustainability information assurance engagements.

3 Slovenia: Current State and Prospective Changes to Auditing Pronouncements

In Slovenia, the Auditing Act (ZRev-2) sets up the legislative frame for the auditing profession. The Act pushes forward the legislative definition of auditing that is comprehensive and wider than the IFAC's definition of financial statements audit. Furthermore, the Act sets up organisations related to auditing and its surveillance (i.e., the Agency for the Public Oversight of Auditing), lists their responsibilities, authorities and tasks, defines various processes, among other matters, who is eligible to become a certified auditor, who conducts their surveillance, etc. On the other hand, the Companies Act (ZGD-1) has pronouncements in relation to an entity's statutory audit (i.e., financial statements audit). It lists entities that must have a financial statements audit, until when the audit should be performed, warrants when the obligation of an audit is not fulfilled, lists some of the elements an auditor's report must have, defines the auditor's legal liability for damages and sets up the process of appointing an auditor. Both Acts (ZRev-2, ZGD-1) are in accordance with the EU's pronouncements, except for the CSRD Directive.

In the following paragraphs, we outline a few prospective amendments that will alter current auditing pronouncements (i.e., in the Auditing Act and the Companies Act which represent Slovenian law). Amendments are stipulated to be prepared in the short term.

We start with the following. The first amendment will incorporate a definition of sustainability reporting (from the CSRD, Article 1, point 2.b) into the Companies Act with direct interoperability with the Auditing Act. Briefly, sustainability reporting represents reporting information regarding issues in the field of sustainability (i.e., environmental, social, and governance issues) in accordance with stipulated prospective European Sustainability Reporting Standards (ESRS Standards). Following the determination of sustainability reporting, again, both acts will incorporate a definition of assurance of sustainability reporting (from the CSRD, Article 3, point 2). Again briefly, sustainability information assurance represents assurance engagement in which a practitioner expresses a conclusion about the outcome of the evaluation of sustainability information against ESRS Standards and other legislative pronouncements (from the CSRD, Article 3, point 18). Subsequently, new terms will be placed at least in the Auditing Act. These are key sustainability partner and independent assurance service provider (IASP) (from the CSRD, Article 3, point 1). The following definitions will be altered, which is extended to include matters in relation to sustainability information assurance under CSRD Directive requirements that sustainability information assurance engagements are going to be conducted by an auditor of financial statements. These definitions are statutory auditor, audit firm, third-country audit entity, third-country auditor, and group auditor (from the CSRD, Article 3, point 2). A statutory auditor (in Slovenia subsequently further defined in Auditing Act as a certified auditor) is going to be a practitioner that can express a conclusion on a sustainability information assurance engagement. A statutory auditor will take the role of key sustainability partner as a person with the responsibility of carrying out sustainability information assurance engagement and signing the auditor's assurance report on the entity's sustainability reporting (from the CSRD, Article 3, point 2). To put it simply, the term independent assurance service provider will be incorporated into pronouncements under the condition that a political decision will be made that other providers than an auditor of financial statements could also conduct sustainability information assurance engagements. Any practitioner will have to follow the standards adopted by the European Commission. Since the CSRD Directive requires

that IASP have equivalent educational qualifications and examination of professional competence, ethical requirements (i.e., independence requirements) and quality assurance as are stipulated for statutory auditors (from the CSRD, Article 3, points 3–8), it is in our opinion considering all circumstances in relation to the auditing framework in Slovenia less likely that this political decision will be made.

At the same time as the amendment regarding statutory auditor, the amendments concerning licence (approval) to carry out the task of a certified auditor will be placed. These will dissolve the dilemma of who has the capabilities to conduct sustainability information assurance engagements. Currently, a certified auditor must meet the following three conditions (note: there are three more requirements): at least a second-level study programme (i.e., master's degree), a minimum of three years of experience in auditing and at least five years of work experience cumulatively, passed examination of professional competence for a certified auditor. In relation to the examination of theoretical knowledge, a prospective certified auditor (for sustainability information assurance engagements) will have to pass an examination in courses in (a) legal requirements and standards relating to the preparation of sustainability reports (i.e., demonstrate knowledge of national pronouncements in relation to sustainability, ESRS Standards and other standards, frameworks and guidelines in relation to sustainability reporting); (b) sustainability analysis; (c) due diligence processes in relation to sustainability issues; and (d) legal requirements and standards in related to conducting sustainability information assurance engagements (from the CSRD, Article 3, point 5). Furthermore, in relation to practical training requirement, a prospective certified auditor (for sustainability information assurance engagements) will have to carry out at least eight months of practical training on sustainability information assurance engagements or sustainability-related services (from the CSRD, Article 3, point 6). Both requirements, the examination of professional competence and practical training, shall guarantee the necessary level of theoretical knowledge and the ability to apply such knowledge in practice. Requirements will be equal for a certified auditor who previously conducted auditing of financial statements and will want to gain an additional licence for carrying out sustainability information assurance engagements (from the CSRD, Article 3, point 9). There are transitional provisions in place but are not explained in detail in this paper.

4 Conclusion

The CSRD Directive stipulates that the statutory auditor of the entity's financial statements will provide sustainability information assurance. Sustainability information assurance engagement differs from financial statements auditing. Therefore, there are dilemmas that are systemic in nature, especially in the forthcoming transitional period. The first concluding remark is the following. It cannot be concluded without the feeling that in the current rush to ensure some form of sustainability assurance, the approach is more an ad hoc approach (not being carefully thought through) than it is a systemically thoroughly planned approach. There is a missing decision on the final system, structure and form of the sustainability information assurance engagement system and how to enable and achieve envisioned system. The current ad hoc approach resembles the work of a bulldozer: first, the existing financial statements auditing system will be amended, and if necessary, the system will be later changed.

The second conclusion is the following. The CSRD Directive does not stipulate any new institutes regarding auditing. The existing financial statements auditing provisions are amended with matters in relation to sustainability information assurance engagements. Third conclusion. The CSRD stipulates an assurance related to the credibility of the sustainability information or reporting. Nevertheless, the level of assurance is limited assurance. It can be expected that this will cause a growth in the expectations gap regarding sustainability assurance. This gap could be enormous in the first few years of CSRD's sustainability information assurance engagements.

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Blockchain Technology in Banking as a Tool Towards the SDGs

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Abstract Purpose of this paper is to investigate potential implications of blockchain in banking and its contribution towards the Sustainable Development Goals (SDGs). We use qualitative analysis based on case study analysis and netnography for determining existing and potential implications of blockchain in banking and their possible contributions towards the SDGs. This paper's originality is finding specific potential contributions of blockchain technology in banking towards SDGs, such as towards ending poverty with increasing financial inclusion, promoting well-being for all with improving banking institutions' performance and towards climate action by reducing banking institutions' environmental print with digitalizing their processes and services.

Keywords:
blockchain, banking, SDGs, case studies, practical implications

JEL:
G21, L86, Q01

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1 Introduction

Banking is one of systemically most significant industries in the global economy. It is vital that systemically important industries focus on its contribution towards the SDGs for swifter movemement towards these goals. Blockchain presents significant potential for banking institutions. Banks invest the most in blockchain technology compared to other financial institutions as it offers various implications that could significantly benefit the banking sector. Due to that it poses crucial tool for simpler and more efficient achievement of SDGs (Aysan et al., 2021).

This paper focuses on potential blockchain's contributions to banking industry's movement towards the SDGs. We conduct complex literature review to find particularly to which SDGs and how can blockchain implementations in banking contribute. Purpose is to contribute to better understanding and future seizing of blockchain's potential in banking industry in the context of sustainable development of global economy.

The paper is structured as follows. An introduction is followed by theoretical background and methodology. Then we present results of our findings and conclude with discussion.

2 Theoretical Background

Blockchain is a new type of technology defined as a "type of distributed ledger technology (DLT) in which transactions are validated and recorded in the distributed ledger in separate but connected batches known as blocks" (ECB, 2022). Blockchain presents the most known example of DLT (Garg et al., 2021) and is most known as the infrastructure of cryptocurrencies. Recently, blockchain technologies became an area of interest in the financial industry. Providers of financial services are using it to amplify their data classes security, setups cooperation, as well as for decentralizing their transactions and increasing their safety (Garg et al., 2021). Figure 1 presents investments of leading financial institutions in blockchain enterprises in 2019, by number of investments. Banking industry conducted the vast majority of investments, gesturing blockchain's importance in it.

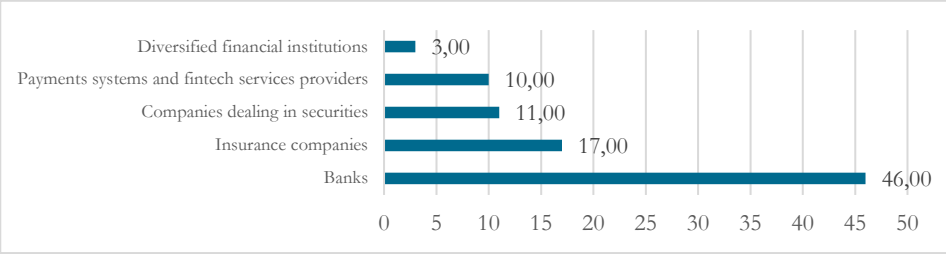

Figure 1: Investments of financial institutions in blockchain technology (in 2019, by number of investments)
Source: (Statista, 2022b; MINDSMITH, 2020).

Blockchain has a wide range of possible implications in banking sector. Firstly, it could reinforce security. Financial crime is a serious threat that is frequently increasing, especially in the form of cybercrime, as digital banking increases in popularity. Europol (2021) states that cybercrime is increasing along with the sophistication of attacks, which are likely underreported. This issue will most likely increase in the future, as Europol expects the use of AI to increase in cybercrime, thus widening the scope and scale of cyberattacks. Blockchain could bring an extra sense of security in banking business models (Hassani et al., 2018; Maiya, 2017), mostly due to the fact that within blockchain technologies, changing historical information is not possible, while any new information is shared with multiple participants, thus the probability for data manipulation is lowered significantly (Hassani et al., 2018). Changes to data are monitored and tracked to prevent fraud and embezzlement and communication and updates are enabled in a timely matter to detect financial crime (Hassani et al., 2018). Blockchain works as a distributed ledger entirely open to network participants. Once the information is registered, it is very challenging to make any changes, thus ensuring built-in security (Garg et al., 2021).

Secondly, blockchain could increase transparency. It could enhance transaction capacities of debit and credit cards. As they increase, so does the importance of transparency. Traditional banking models can be considered secretive, while any alteration of public blockchains is fully viewable. Thus, the challenge of trust in transactions can be conquered with blockchain technology. Additionally, more transparent and quickly viewable auditing can be achieved. Automated financial reporting is another potential benefit, as banks and regulators could communicate

and implement actions much faster in case of compliance violations (Hassani et al., 2018).

Moreover, blockchain could enable faster transactions. Traditional banks have rigorous rules regarding users' transactions, often resulting in delays. Use of blockchain technology offers banks the possibility of speeding up their procedures with direct and frequently updated transactions made immutable with the help of encryption (Hassani et al., 2018).

Further, blockchain has significant potential for reducing banking costs for procedures and transactions (Hassani et al., 2018). Study found blockchain is expected to enable notable cost reductions in banks (Rajnak & Puschmann, 2021). Moreover, Rega (2017) studied 38 banks in European area and found that innovations in technology are positively correlated with profitability of banks. IFC also reported blockchain can lower verification costs in remittance services, as well as other provisions (IFC, 2019).

Lastly, blockchain could better customer verification and KYC, which present great cost for banks. Blockchain could be a lower-cost solution with digital fingerprint. McKinsey estimated blockchain to reduce fraud losses from 7 to 9 billion USD annually, while lowering operating costs of traditional banks up to 1 billion USD (Higginson et al., 2019).

Additionally, blockchain can improve with intelligence and simplify essential elements of financial industry, such as contracts. Due to blockchain, smart contracts created with programming could substantially ease the complexity and time needed for arranging contracts, positively influencing value chains and procedures (Hassani et al., 2018; Rajnak & Puschmann, 2021). Gambacorta (2022) from Bank for International Settlements also noted that smart contracts and DLT in generally could better monetary and financial system's efficiency. Blockchain technology would enable banks to pool large quantities of data and anonymize and protect them with ledger's encryption procedures. With customer consent ensured with smart contracts, banks could view uploaded information from any bank in network, enabling them to make decision faster and more efficient (Higginson et al., 2019).

Thus far, blockchain has been implemented in banking to some extent. State Bank of India developed a blockchain consortium, comprised of 10 banks, intended for financial transactions. Included banks share KYC information, as well as information about terrorism and money laundering situations (Garg et al., 2021, p. 2). The Emirates Islamic bank from UAE as the first Islamic bank implemented blockchain technology for cheque books to better prevent fraud. The South Africa Reserve bank has also used blockchain for their payment transactions, and managed to settle 70.000 transactions in just two hours while ensuring full anonymity (Hassani et al., 2018). Goldman Sachs and J.P. Morgan now have blockchain laboratories. J.P. Morgan partnered up with banks to launch blockchain payments network Interbank Information Network (INN). American Express established blockchain-based payments with Ripple, a fintech enterprise (Osmani et al., 2021). At first, blockchain was not accepted well in the banking and investment industries (Garg et al., 2021), however now it seems financial and banking industry no longer see it as a threat but finally as an opportunity (Osmani et al., 2021). Figure 2 shows that in 2020, the banking industry had almost 30% share in global blockchain spending.

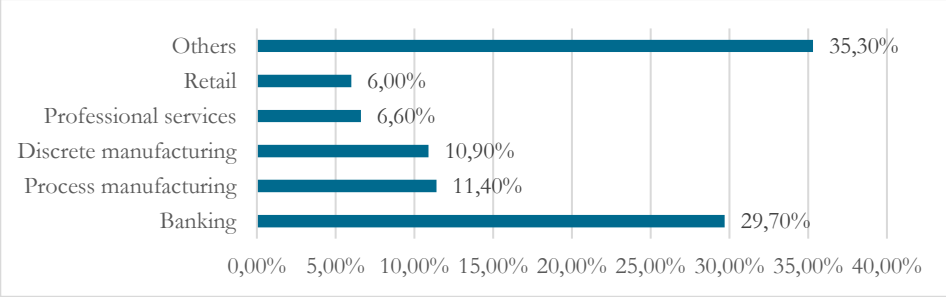

Figure 2: Blockchain market value (in 2020, by sector)
Source: Statista (2022a).

One of the most significant potential implementations of blockchain in banking is in terms of Central Bank Digital Currency (CBDC), electronic version of cash issued by a central bank (Alonso et al., 2021), which could compared to private alternatives such as cryptocurrencies offer more privacy and security (Ahnert et al., 2022). Almost 50% of central banks have already run experiments regarding CBDC or released proofs-of-concept (Syarifuddin & Bakhtiar, 2022), such as People's Bank of China, Central Bank of The Bahamas, European Central Bank and others. Additionally, fundamental question is how it would impact monetary and financial

stability (Alonso et al., 2021). Undoubtedly, it will impact every participant in the financial system. Because of that and their market position banks are aiming to acquire a significant role in the process.

While it promises many benefits, blockchain is not without its challenges, such as limited transaction capacity and scalability (Gambacorta, 2022; Hassani et al., 2018), security, regulation, governance and costs (Garg et al., 2021; Hassani et al., 2018). In terms of SDGs, main concern are higher energy costs (Garg et al., 2021). Analysis such as cost-benefit can determine whether benefits outweight the costs for banks.

3 Methodology

Data included blockchain statistics and studies collected from digital research bases and banks. Research was limited to publicly available data. The methodology is based on qualitative analysis. Firstly, we used netnography for observing online research findings and discussions on blockchain's potential and implementation in banking and towards the SDGs. Secondly, we focused on the case study method, for this purpose we collected data on existing blockchain use in banking sector from various banks worldwide such as State Bank of India, South Africa Reserve Bank, The Emirates Islamic Bank, J.P. Morgan, Goldman Sachs, and others. Lastly, based on both methods, we conducted theoretical inference on possible contribution of blockchain in banking towards achieving the SDGs.

4 Findings

Potentials of blockchain in banking are wide and promising. As such they could be a significant element of banking industry's contribution towards the SDGs (Kewell et al., 2017).

The first SDG is to end poverty. Blockchain can contribute to this goal by increasing financial inclusion. Offering more affordable services to less fortunate might not be cost-effective for traditional banks, processing micro-transactions through blockchain technology could connect smallholders and enable engagement in micro-trade or micro-lending for the fortunate population, which is often overlooked by traditional banks (Aysan et al., 2021). Neobanks, new digital banks often using blockchain technology, offering lower-priced banking products and services, could also be an important tool in lowering banking inequality (Temelkov, 2020). Asian

Development Bank established its blockchain-based decentralized network called Everest. It focuses on cross-border payments through blockchain, while it also enables biometrics verifications, e-wallets and compliance reporting regarding KYC and anti-money laundering (Aysan et al., 2021; Everest, 2023). Blockchain's improvement of management of records and surveillance for banks could enhance their performance and reduce their inefficiencies, which could contribute to third SDG: promoting well-being for all (Aysan et al., 2021). The digital authentication could reduce the need for visits to bank's operating branch, as well as more simple and digital delivery of banking services (Aysan et al., 2021), which would result in lower logistics imprint on the environment, contributing to the thirteen SDG, climate action. By enabling secure digital transfers, it could reduce the range of physical documents, processes and meetings in banking institutions, which would also lower logistics imprint and contribute to the thirteen SDG. Optimizing these processes would make them more efficient, thus contribute to the eight SDG, decent work and economic growth, while also making consumption of energy in banks and their production more responsible, consistently with twelve SDG, responsible consumption and production. By making banking institutions more cost-effective, blockchain could enhance their budget for further investments and donations towards other SDGs, for instance toward resilient infrastructure, fostering innovation, sustainable industrialization and protecting ecosystems and biodiversity loss.

Potential for blockchain's contribution to SDGs extends beyond banking, such as contributing to second SDG, ending hunger, by optimizing global food chain, loss and waste with increased transparency, to fourth SDG by optimizing healthcare processes and raising financing for future development (Aysan et al., 2021).

5 Discussion and Conclusion

The aim of this paper was to investigate possible contributions of blockchain in banking towards the SDGs. Many potential contributions were found, such as increasing financial inclusion and reducing environmental imprint of banking institutions by optimizing and digitalizing their processes. Findings can be used in the development of sustainable practices in banks. Banking institutions, along with blockchain technology, can significantly contribute to global achievement of SDGs. For that reason, SDGs must be prioritized and further researched in the context of banking and blockchain technology.

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SUSTAINABLE FINANCING – EUROPEAN LEGISLATIVE FRAMEWORK AND IMPACT ON THE ECONOMY

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Abstract The financial sector is not immune to the risks caused by climate change and environmental degradation, and it follows trends and improves its contribution to sustainability. Strengthening economic and financial resilience to sustainability risks is one of the priorities of legislators at the global level. Sustainable financing as one possible solutions refers to the practice of providing funding to projects or businesses that promote sustainability, including social, environmental, and economic sustainability and the paper analyses its impact on economic development and increasing competitiveness. The aim of sustainable financing is to support projects that not only generate financial returns, but also have a positive impact on society and the environment. The paper is based on the analysis of empirical data and critical review of literature. Empirical data for the study are the secondary data retrieved from European Central Bank and European regulations.

Keywords:
sustainable financing, economic and financial resilience, circular economy, sustainable development, European Central Bank, European regulations

JEL:
F18, F64, K20

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1 Introduction

An effective and smooth transition towards a net-zero economy cannot be made without a coordinated response between fiscal authorities, central banks, regulators, and supervisors. Public policies created for the purpose of reducing climate change directly affect the economies of the member states, but also of the European Union and its single market. After the UN General Assembly adopted a new global sustainable development framework: the 2030 Agenda for Sustainable Development, which is fully compliant with the Sustainable Development Goals, the European Council confirmed the commitment of the Union and its Member States to the implementation of the 2030 Agenda in a full, coherent, comprehensive, integrated and effective manner (Regulation EU 2019/2088, 1).

The financial sector holds power in funding and bringing awareness to issues of sustainability, whether by allowing for research and development of alternative energy sources or supporting businesses that follow fair and sustainable labor practices (Bakken, 2021) and sustainable finance is one of key factors of the circular economy contributing positively to growth, development, and financial inclusion.

The circular economy is an economic system that aims to eliminate waste and promote the continuous use of resources. It is a model of economic development that emphasizes the importance of sustainability and seeks to replace the linear "take-make-dispose" approach with a more cyclical one. In a circular economy, resources are kept in use for as long as possible, waste is minimized and materials are regenerated at the end of their lifecycle. The circular economy has become increasingly important as a model of economic development that aligns with environmental and social goals. Governments and businesses around the world are adopting circular economy principles to reduce waste, conserve resources, and promote sustainable growth.

Sustainable financing refers to the process of raising and managing financial resources in a way that supports sustainable development, which is the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. This type of financing is designed to integrate environmental, social, and governance (ESG) considerations into financial decision-

making. Sustainable financing includes a range of financial instruments such as green bonds, sustainability-linked loans, and social impact bonds.

According to the Special Audit Report 22/2021 on the EU's approach to sustainable finance, "under the 2021-2027 Multiannual Financial Framework, the EU plans to support public and private investment by allocating at least 30 % of the EU budget to climate action. The EU budget part is estimated to be around €358 billion, including the €7.9 billion budgetary guarantee related to Invest EU. In addition, Member States will have to allocate at least 37 % of the funds they receive under the Recovery and Resilience Facility to supporting climate action. This is estimated to be around €268 billion."

Hence the question arises: how important an adequate legal framework is for the implementation of sustainable financing and how much it, as part of the circular economy, affects the increase in competitiveness?

The aim of this paper is to answer to that question, so authors discuss the very concept and types of sustainable financing as part of the circular economy, its legislative framework and find a link to the direct impact on the economy, as well as the potential increase in competitiveness as a result of sustainable financing of innovations and acceptance of the circular economy as condicio sine qua non.

The paper contributes to the literature by emphasizing the importance of adequate regulatory framework and its impact on boosting the global competitiveness in innovation and green and digital transition.

2 Theoretical Background

In the literature, definition and importance of sustainability, sustainable financing and its impact on the economy is analyzed from very similar perspectives. As previously said, the effective transition to a net-zero carbon economy requires a major shift in financial flows and it depends of coordination of financial policy bodies — financial regulators, ministries of finance and supervisors (Mikheeva & Ryan-Collinc, 2022; ECB, 2022).

Lovciová (2022) and Bednarčíková and Repiská (2021) define sustainability as protection of our natural environment and support of the balance between ecosystems and innovation. Abdalmuttaleb et al. (2022) explain that sustainability involves the adaptation of today's business model to the dynamic nature of the current digitalized environments and that corporations need to make sure that resources are being used responsibly and efficiently.

As previously said, sustainable financing includes a range of financial instruments such as green bonds, sustainability-linked loans, and social impact bonds.

Green bonds are debt instruments that are used to finance environmentally sustainable projects, such as renewable energy, energy efficiency, and sustainable agriculture. These bonds are certified by third-party organizations to ensure that the funds are used for sustainable projects. Like any other bond, a green bond is a fixed-income financial instrument for raising capital from investors through the debt capital market (OECD, 2015).

Sustainability-linked loans are a type of loan that incentivizes borrowers to achieve specific sustainability targets, such as reducing greenhouse gas emissions, by offering lower interest rates if the targets are met.

Social impact bonds are a type of financing that links financial returns to achieving social outcomes, such as reducing homelessness or improving education outcomes. These bonds are often issued by governments or non-profit organizations.

The circular economy is an economic system that aims to eliminate waste and promote the continuous use of resources. It is a model of economic development that emphasizes the importance of sustainability and seeks to replace the linear "take-make-dispose" approach with a more cyclical one. In a circular economy, resources are kept in use for as long as possible, waste is minimized and materials are regenerated at the end of their lifecycle.

Discussing about connection between sustainability and finance sector, Mikheeva and Ryan-Collinc (2022) emphasize the fact how historically, financial policy bodies have played a direct and coordinative role in industrial and economic development,

often via close collaboration with dedicated public financial institutions such as national development banks.

When analyzing the connection between sustainable financing and circular economy, it is easy to see their close connection as both focus on creating a long-term sustainable future. Sustainable financing is the practice of providing financial services to companies that operate in the most sustainable way possible, while circular economy is an economic system that aims to reduce waste and promote the use of resources in a more sustainable and efficient manner.

In a circular economy, products are designed to be reusable, repairable, and recyclable, reducing waste and extending their lifespan. Sustainable financing can help to support this approach by providing funding to companies that prioritize investments in circular economy practices, such as the adoption of renewable energy, the development of circular supply chains, and the implementation of innovative recycling and waste management processes.

Additionally, sustainable financing can also incentivize companies to engage in sustainable business practices, such as reducing their carbon emissions and using sustainable materials. These efforts can contribute to the circular economy by reducing resource consumption and waste production.

Overall, sustainable financing and circular economy are inherently linked as they both strive towards creating a sustainable future where economic growth is achieved without harming the environment or depleting natural resources.

This paper focuses on the importance of adequate legislative framework and the impact that sustainable financing has on the economy.

When analyzing the regulatory framework, the most important part of European regulation for sustainable financing are Regulation (EU) 2020/852 (the 'Taxonomy Regulation'), Regulation (EU) 2019/2088 on sustainability-related disclosures in the financial services sector and Regulation (EU) 2019/2089 as regards EU Climate Transition Benchmarks, EU Paris-aligned Benchmarks and sustainability-related disclosures for benchmarks.

The Taxonomy Regulation is an important piece of legislation for enabling and scaling up sustainable investment and thus implementing the European Green Deal, including an economy that works for people and ensures a just transition that creates employment and leaves nobody behind. It applies to financial market participants that offer financial products, financial and non-financial undertakings within the scope of Directive 2014/95/EU (the Non-Financial Reporting Directive - 'NFRD').

"On November 28, 2022 the EU Council and European Parliament reached an agreement to adopt the Corporate Sustainability Reporting Directive (CSRD). The legislation significantly expands mandatory sustainability disclosure requirements for all large EU companies operating in the EU. More recently, the EU Council proposed to exempt banks and investment funds from CSRD following resistance from several member states including Spain, France, Italy and Slovakia. The draft proposal allows each member state to decide whether financial services providers should account for their environmental and social footprint" (ESG Book, 2022).

3 Methodology

The paper is based on the analysis of empirical data and critical review of literature. Empirical data for the study is the secondary data retrieved from European Central Bank, OECD and European regulations.

The paper analyzes the literature that has studied the relationship between energy-saving innovation and two broad factors: market forces and public policies. Studies using various methods and samples have reached the same conclusion: higher energy prices speed up innovation in energy-saving technologies and have major impact on sustainable (Breckenfelder et al., 2023).

According to Breckenfelder et al. (2023) the studies show that the energy efficiency of home appliances was strongly correlated with energy prices. Also, some studies find that a 10% increase in energy prices leads to 3.5% more patents in energy-saving technologies. If using aggregate data on GDP, energy, capital, and labor to compute a measure of the energy efficiency, studies show that energy efficiency has increased steadily since the oil shocks of the 1970s. If comparing how gas prices shape innovation in the car industry, there are conclusion that 10% increase in fuel prices leads to 8.5% more innovation that develops alternatives to fossil fuel engines, and

an 8.3% decline in innovation within the class of fossil fuel engines. In other words, the literature has broadly concluded that the direction of energy-saving innovation is endogenous and can be changed by market forces and adequate regulatory framework (Breckenfelder et al., 2023; OECD 2015).

4 Discussion and Conclusion

Sustainability is based on three pillars: economic, social, and environmental sustainability. Economic sustainability refers to the ability of an economy to support long-term growth and development. It includes creating jobs, reducing poverty, and promoting economic stability. Social sustainability refers to the ability of a society to support the well-being of its members and includes social equity, access to education and healthcare, and human rights. Environmental sustainability refers to the ability of natural systems to support life and maintain their ecological balance and includes protecting biodiversity, reducing pollution and waste, and addressing climate change.

Sustainable financing refers to the practice of investing in projects and businesses that promote long-term economic, social, and environmental sustainability. This type of financing can have a positive impact on the economy in several ways.

First of them is improved resource efficiency. Sustainable financing can encourage businesses to adopt more resource-efficient practices, reducing waste and lowering operating costs. This can lead to increased productivity and profitability, which can help stimulate economic growth.

Second one is increased investment in green technology. Sustainable financing can help direct investment towards companies that develop and produce green technologies, such as renewable energy, energy-efficient buildings, and sustainable transportation. This can create new jobs and industries, as well as reduce dependence on fossil fuels.

Third is related to reduced risk. Investing in sustainable projects and companies can reduce risk in the long term. For example, by investing in companies that have strong environmental and social practices, investors can avoid potential negative impacts such as environmental disasters or social unrest, which can have significant economic costs.

Improved reputation is also a way sustainable financing affects economy. Companies that prioritize sustainability and responsible practices may have a better reputation among customers, investors, and other stakeholders. This can lead to increased brand value and customer loyalty, as well as improved access to financing and investment.

Also, sustainable financing can spur innovation by incentivizing companies to develop sustainable products and services that meet the demands of environmentally conscious consumers.

Improving corporate reputation is another element of effecting economy by sustainable financing models. Sustainable financing can enhance a company's reputation by demonstrating its commitment to sustainability, which can help attract socially responsible investors and customers.

In big way sustainable financing can lead to reducing costs. Sustainable financing can help reduce costs by promoting energy efficiency and waste reduction, which can lead to lower operating expenses and higher profits.

Also, sustainable financing can help companies mitigate risks associated with environmental and social issues, such as climate change and human rights violations. This can help prevent costly legal and reputational damages.

And last but not least, sustainable financing is connected with supporting economic growth. Sustainable financing can support economic growth by promoting sustainable development and reducing environmental degradation, which can help ensure the availability of natural resources and preserve ecosystems.

Sustainable financing can help promote long-term economic growth and stability by encouraging businesses to adopt sustainable practices, invest in green technology, and reduce risk.

The impact of different sustainable financing models on organizations varies depending on their nature, size, industry, and financing needs. Here are some potential impacts:

Equity financing: Organizations that opt for equity financing sell a portion of their ownership to investors in exchange for funds. This model may be more suitable for startups or smaller businesses that have limited financial resources or no credit history. Equity financing could provide access to significant capital, but it also means that the organization has to share its profits with the investors and may have to sacrifice some control over its decision-making.

Debt financing: Organizations that choose debt financing take loans from financial institutions, such as banks or credit unions, and pay them back with interest. This model may be more suitable for larger organizations with proven track records and stable cash flows. Debt financing could provide a predictable source of funds, but it also means that the organization has to pay interest and principal on time and may face penalties for default.

Crowdfunding: Organizations that use crowdfunding platforms, such as Kickstarter, Indiegogo, or GoFundMe, ask the public to contribute small amounts of money to fund their projects or ventures. This model may be more suitable for organizations that have a loyal customer base or a compelling social or environmental mission. Crowdfunding could provide a way to test the market and engage with supporters, but it also means that the organization has to meet its fundraising goals and deliver on its promises.

Impact investing: Organizations that receive impact investments from investors who prioritize social or environmental outcomes along with financial returns. This model may be more suitable for organizations that have a clear social or environmental mission and can demonstrate their impact. Impact investing could provide access to patient capital and strategic partnerships, but it also means that the organization has to measure and report its impact and align its goals with the investors' values.

In conclusion, each sustainable financing model has its advantages and disadvantages, and organizations should carefully consider their goals, priorities, and capacities before choosing the most appropriate one for their needs.

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Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector Official Journal of the European Union L 317

Regulation (EU) 2019/2089 of the European Parliament and of the Council of 27 November 2019 amending Regulation (EU) 2016/1011 as regards EU Climate Transition Benchmarks, EU Paris-aligned Benchmarks and sustainability-related disclosures for benchmarks Official Journal of the European Union L 317

EMOTIONAL INTELLIGENCE TRAINING TOOLS FOR BUSINESS

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Abstract This study aims to present practical tools for developing emotional intelligence (EI) in training entrepreneurs, managers and business students. The study proposes innovative tools that allow consistent development of each part of the 4-component instrumental model for emotional intelligence development. The systematic approach is based on contemporary theoretical research and uses applied software. An alarm clock is one of the promising Emotional Intelligence Training Tools. Alarm clocks are created using chatbots in the Smart Sender program. The dynamics of emotional intelligence development of entrepreneurs, managers and business students is tracked through questionnaires and building emotional intelligence profiles. The practical value of Emotional Intelligence Training Tools lies in their simplicity and effectiveness in an educational environment.

Keywords: emotional intelligence, model, tools, training, entrepreneurs

JEL: A20, C83, O35

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1 Introduction

Sustainability goals include quality education, good health and well-being (United Nations, 2015). The current challenge in the training of highly skilled managers, entrepreneurs and business students is the development of soft skills. The Future of Jobs Report 2020 proclaimed emotional intelligence a key and high-demand soft skill (The Future of Jobs Report 2020; 2020). EI can be the foundation for crucial soft skills such as leadership and social influence, resilience, stress tolerance, flexibility, etc. One of the preconditions for the successful development of EI is using Emotional Intelligence Training Tools (EITTs) in the educational environment (Almeida & Buzady, 2022). Implementing EITTs enhance the use of time, age advantages and potential of learners. The up-to-date software has the potential to diversify the process of building self-awareness, self-management, cognitive empathy, teamwork, and effective communication. Documents presented at learning platforms such as Coursera, Udemy, Prometheus and scientific results from Scopus and Web of Science databases are also essential sources of information that can enliven the learning process and maximise its effectiveness.

This study aims to present EITTs we have developed to contribute to the successful training of managers, entrepreneurs and business students. The tools proposed in this study have been tested in an educational setting and may interest educators and researchers interested in EI development.

2 Theoretical Background

Emotional intelligence creates additional opportunities throughout the professional activity of entrepreneurs, managers and business students. In the beginning, EI increases the learning of new knowledge and boosts the formation of other soft skills necessary for a successful career. EI enhances entrepreneurial intentions and self-efficacy, increases stress tolerance, openness, and knowledge-sharing behaviour (Hornung & Smolnik, 2021), increases communication effectiveness and improves decision-making (Çetin & Karakaş, 2021). EI helps realise leadership skills, increases team cohesion and collaboration, and saves time in achieving results (Zhang & Shengyue, 2022; Brečko, 2021). Furthermore, EI ensures stable social connections (Zhang & Adegbola, 2022), a good reputation and success.

Overall, EI positively affects job performance and productivity in the professional activities of entrepreneurs (Lu et al., 2022). Employees with high EI increase the company's value and lead to an increase in company revenues, cash flow and customer loyalty. EI is particularly relevant for human management research. The higher the position managers hold, the more significant the impact of their EI. Managers' EI affects not only the quality of work but also the financial performance of companies. Managerial EI also impacts employee well-being, satisfaction, and health (Semenets-Orlova et al., 2021).

Research studies likewise proved the importance of EI for business students, as highlighted in recent research (Lu et al., 2022). Karimi and Ataei (2022) suggested that the students' higher emotional intelligence is a precondition to acquiring and reinforcing entrepreneurial skills. The researchers proved a significant positive correlation between entrepreneurial self-efficacy and EI (Karimi & Ataei, 2022; Halliwell et al., 2022). The university study is considered an ideal entrepreneurial period, especially for vocational college students who pay more attention to entrepreneurship and innovation education (Wen et al., 2020). However, despite the undeniable value of EI, a literature review revealed a need for practical tools for developing the EI of entrepreneurs, managers and students (Nurhas et al., 2022).

There are three main theories behind EI development: the non-cognitive theory of EI developed by Bar-On, the theory of emotional and intellectual abilities by Meyer and Salovey, and the mixed theory of emotional competence by Goleman. However, the proposed models do not fit the entrepreneurial and business environment well. Therefore, we developed a 4-component instrumental model for developing EI (4EI Model). The 4EI Model was developed as a result of the generalisation of fundamental and recent scientific publications, including Goleman's model (Wolff, 2005). This model is the basis for the evolution of EITTs. Using EITTs develops Self-awareness, Self-management, Social-awareness and Relationship management of entrepreneurs and managers.

3 Methodology

This study uses the 4-component instrumental model to develop EI (4EI Model). The 4EI Model is adapted to the entrepreneurial and business environment and includes 19 competencies (Mikuš et al., 2021). We use the "Emotional Intelligence in Business" questionnaire to monitor the learning outcomes of the 4EI Model

(Mikuš et al., 2021). The questionnaire allows us to visually display the results as an EI diagram of four quadrants – emotional intelligence profile (EI profile). The questionnaire has been empirically proven, and demonstrator and confirmation analysis was carried out using the programs MS Excel, SPSS, STATISTICA, FACTOR, and R-Studio.

To develop EITTs, we used the Smart Sender program. Self-awareness Alarm Clocks and Self-management Alarm Clocks are projects in the Smart Sender program with separate funnels. By following the links, students sign up for the chatbot on Telegram and receive messages for a set period of study. Subscription to the Alarm clocks is free and voluntary.

Testing is part of the learning process. We offer students to take the "Emotional Intelligence in Business" questionnaire before and after their training. The proposed EITTs have been implemented and validated in the elective course "Emotional intelligence in youth and senior entrepreneurship" at Comenius University Bratislava and "Leadership and emotional intelligence" at the Ukrainian engineering pedagogics academy.

4 Results

In the educational course, we selected EITTs for the development of each component of EI: Self-awareness, Self-management, Social-awareness and Relationship management. We implement Challenge Based Learning (Leijon et al., 2021) by solving real-world challenges. In addition to revealing the theory for each quadrant, we use the following practical tools.

4.1 Self-awareness tools

The alarm clock is one of the promising Emotional Intelligence Training Tools. To form the Self-awareness skill, we use three types of Alarm Clocks.

Self-awareness Alarm Clock 1 helps students better understand their limitations, fears, opportunities, strengths, and weaknesses.

Procedure. During the week, every 3-4 hours, students receive questions to which they can immediately write an answer (Figure 1). Students cannot see each other's answers. The alarm clock invites them to reflect on one's self-perception and forms the habit of thinking.

Result. Accurate self-assessment and self-confidence are formed.

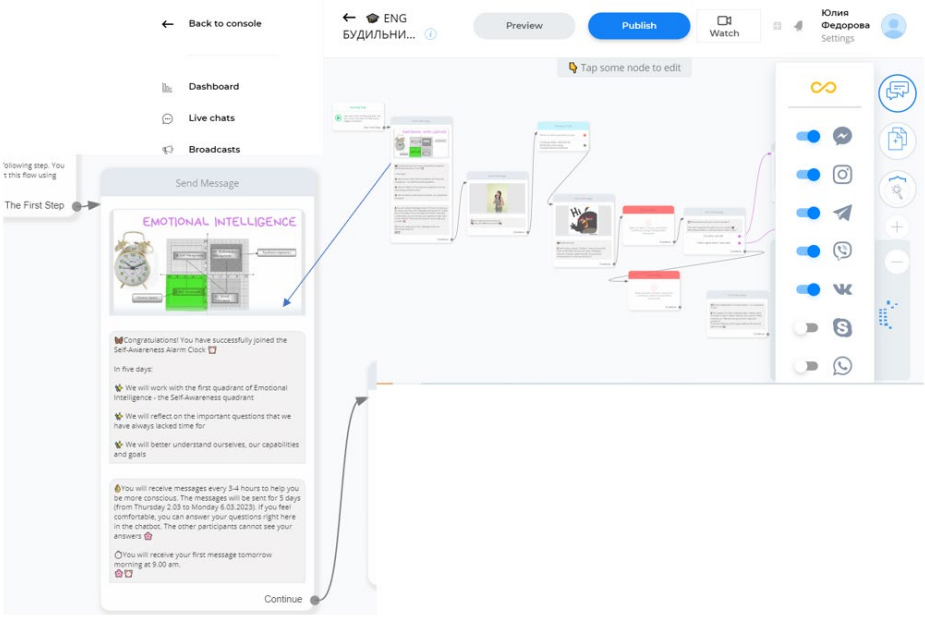

Figure 1: Fragment of Self-awareness alarm clock 1, own elaboration
Source: https://t.me/Clock_SEID_bot?start=ZGw6MzU3MDU

***Self-awareness Evening Alarm Clock* 2** forms the habit of reflecting on the day that has passed.

Procedure. During the week, students receive evening messages. The message offers to describe the three main emotions of the past day. It is vital to describe emotions and the events that caused them.

Result. Increased awareness of one's most experienced emotions and moods.

***Self-awareness Stop Alarm Clock* 3** is a stopping tool that helps to track and clarify the internal state.

Procedure. During the week, at various time intervals, students are given a question to track their current emotions. A prerequisite is using an emotion dictionary to describe their feelings in clear and precise words.

Result. The accuracy of perception of one's emotions increases.

4.2 Self-management tools

We use the Alarm Clock and the Presentation to form the competencies of this component.

Self-management Alarm Clock introduces students to possible non-standard situations at work.

Procedure. During the week, several times a day, students receive short video assignments with problem situations at work. For example, the video material from training courses on Coursera is used. Students can send their solutions to prevent conflict and stressful situations at work.

Result. Awareness of the importance of self-control at work is growing. There is an identification of unacceptable actions in professional activities.

Presentation of ways to control conditionally negative emotions.

Procedure. Students are encouraged to watch the video, for example, the cartoon "Inside out". Then, they can suggest possible problem situations at work for each conditionally negative emotion in the video. Students must propose a solution to the situation. The practical application of this tool indicates an increase in interest and participation of students in discussions.

Result. The ability to predict the consequences of one's behaviour at work is being developed.

4.3 Social- awareness tools

We use the "Pay attention to faces and body" presentations and the "Reading others' emotions" exercise to develop Social-awareness.

"Pay attention to faces and body" presentations contain short video questions and photos to determine emotions.

Procedure. In dynamic mode, students view pictures and videos. They are offered answers. Students guess emotions not only by facial expressions but also by a person's posture. For example, we use an illustration from Pease and Pease (2008).
Result. Increased cognitive empathy.

Exercise "Reading others' emotions"

Procedure. The roles of speakers, face decoders, body decoders and speech decoders are distributed among students. Speakers are given tasks to portray different emotions. Decoders focuses on verbal and non-verbal characteristics for guessing emotions (3-Emotional-Intelligence-Exercises-1.pdf positivepsychology.com).
Result. Organisational awareness improves.

4.4 Relationship management tools

In the last stage, assertive behaviour, teamwork, and effective communication skills are formed. ***Public speaking with arguments*** is the primary tool.

Procedure. Students are invited to prepare a speech on one of the issues on which society has different opinions. The student's task is to convince the audience of the correctness of his point of view. For persuasion, they can use the Argumentation Algorithm, Figure 2. The identifier of success is the number of votes of classmates who believed the speaker.

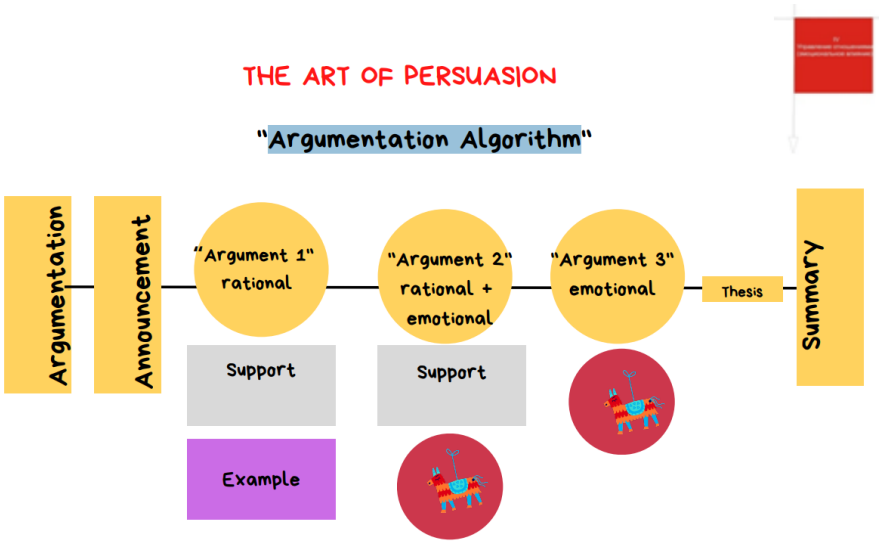

Figure 2: Argumentation Algorithm, author's elaboration.
Source: Authors' elaboration based on Nepryakhin (2016).

In that way, the training course contains dynamic, engaging tools. Involving entrepreneurs and managers in the training process improves the use of their time and potential. Evidence for the effectiveness of the proposed EITTs is the numerical increase in the components of the EI profile, Figure 3.

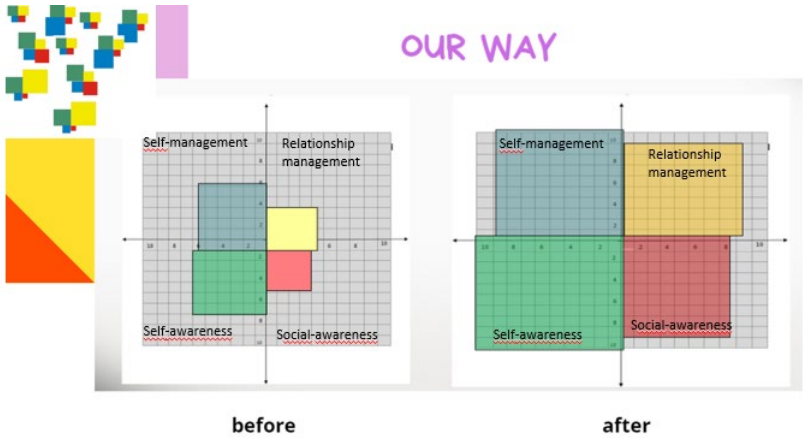

Figure 3: The EI profiles of students before and after applying EITTs
Source: Authors's elaboration.

The effectiveness of EITTs has been confirmed in practice. Thus, presented EITTs develop all four components of the model, Self-awareness, Self-management, Social-awareness and Relationship management of entrepreneurs and managers.

5 Discussion and Conclusion

Despite the importance of EI for entrepreneurs, managers and business students, teaching these skills in universities is still at an early stage. Therefore, the application of EITTs is an essential practical step. Our approach uses the latest theoretical research, modern software, and visualisation elements. Purposeful consistent development of each component makes it possible to increase the level of training of successful entrepreneurs, managers and business students. EITT can enrich modern education. We follow Challenge Based Learning, which enhances the prospects and effectiveness of entrepreneurs', managers' and business students' training. The EITTs are visual, engaging, and involve trainees in learning.

Moreover, in addition to teacher assessment, trainees track their progress by changing their EI profile. We continue to conduct statistical research. Further directions of our research are expanding the arsenal of EITTs and evaluating the effectiveness of EITTs based on statistical studies.

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Exploring the Role of Game-Based Learning in Enhancing Sustainability Knowledge: A Qualitative Study

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Abstract This paper explores the potential of digital games as a tool for promoting sustainability education. A deductive, qualitative research approach using a descriptive research design was employed, with a focus on document analysis on selected digital games already used in education. The study aims to identify key factors that make digital games effective in teaching sustainable topics and to examine the transferability of skills and experiences from the game to real life. The findings indicate that digital games have the potential to be a valuable tool in promoting sustainability education, providing an engaging, interactive, and effective learning experience. The implications, challenges, and opportunities for games-based sustainability education are discussed. The study concludes that further research is needed to explore the most effective ways of integrating digital games into educational curricula and to assess the long-term impact of digital games on sustainability knowledge and behaviour change.

Keywords:
digital games, sustainability education, learning transfer, game-based learning, qualitative study

JEL:
I21, O36

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1 Introduction

Digital games provide an engaging and interactive way to explore socially relevant topics such as sustainability, particularly in classrooms. Recent research shows that digital games enhance student engagement and motivation, facilitate active learning, and promote sustainability knowledge and skills sustainability (Chen et al., 2019). Game designers can effectively coordinate game content, rules, and mechanics to teach sustainability topics. Therefore, further exploration of digital games' potential to promote sustainability is worth considering (Wang et al., 2022).

This exploratory study with its research question 'What are the key factors of a digital game that can be effectively applied in an educational context?' aims to identify the key factors of digital games that can enhance sustainability knowledge in an educational context. Objectives include analyzing existing games on sustainability, identifying player motivation mechanisms, and exploring how real-life experiences can be incorporated into gameplay to promote transferability of skills and knowledge.

This study explores how digital games can enhance sustainability education, identifying player motivation mechanisms and potential classroom applications. The findings could support the development of future games to promote sustainability knowledge and practices. The study provides a unique perspective on the role of digital games in fostering sustainability education and promoting sustainable practices.

2 Literature Review

2.1 Game based learning

Digital game creators excel at coordinating important elements of teaching and learning such as motivation, content presentation, and interaction. Even as gaming becomes more complex, Callois's principles of play, such as voluntary participation, a distinct space from reality, and non-predetermined outcomes, remain relevant. Dicheva et al. (2015) found that gamification strategies in education still incorporate these principles and can promote successful learning outcomes such as autonomy,

competence, and relatedness. Successful learning depends on ensuring learners experience autonomy, competence, and acceptance.

2.2 Serious games and gamification

Digital games have influenced game theory and games studies, and serious games are digital games designed for learning. Gamification uses game principles, such as progress bars, badges, and ranking lists, to increase motivation and promote learning. Successful gamification requires elements such as points, badges, and leaderboards, as well as cooperation, competition, and timely feedback. Gamification elements can be added to learning management systems, including quests, progress bars, badges, leaderboards, avatars, and feedback mechanisms (Deterding et al., 2011; Michael & Chen, 2006; Salen & Zimmermann, 2004).

2.3 Sustainability education and digital games

Digital games are ideal for sustainability education due to their immersive and interactive nature, allowing learners to experiment with strategies and explore complex issues in a risk-free environment. They can also foster emotional connections with sustainability issues, motivating learners to act (Janakiraman et al., 2021; Janakiraman, 2021).

3 Methodology

3.1 Research design and approach

This study employs a qualitative approach with a descriptive research design and utilizes document analysis as the primary research method. It focuses on game theory, game design, gamification, and play and learning, and examines a selection of digital games used in education. The study analyzes the mechanisms that motivate players to engage with the game, the incorporation of real-life experiences, and the transferability of skills.

3.2 Data collection and analysis

This study analyzes how digital games can enhance sustainability education by examining game mechanics, design, and player motivation in educational settings. Over 30 popular games are analyzed based on their potential for learning and reviewed through manuals, design documents, and online forums to identify mechanics that motivate players, such as rewards and challenges. Researchers interviewed players to explore skill transferability to real-world situations, specifically in problem-solving, decision-making, and collaboration. Thematic analysis is used to draw conclusions. The data collected provides insights into the factors of digital games that can enhance sustainability knowledge in education, including the transferability of skills and experiences from games to real-world contexts. The study also reviews relevant literature on game theory, design, gamification, and play and learning to identify key concepts and frameworks.

4 Results

4.1 Using educational games as a tool for sustainability learning

Recent years have seen a growing recognition of digital games as an educational tool. Gee (2018) cites successful educational game projects and the benefits of game-based learning. However, the key consideration in using digital games for educational purposes is the selection of appropriate games and the development of meaningful pedagogical strategies for their use (Rieck, 2022; Schell, 2016).

4.1.1 Analysis of selected games

Recent years have seen a rise in digital games dedicated to teaching sustainability topics, including games like 'The Sims 4 - Live Sustainably' and 'PhoneStory'.

The Sims 4 - Live Sustainably[1] is a digital game that promotes sustainable living by managing a Sims household with eco-friendly items to reduce waste and carbon footprint. Players receive rewards for making sustainable choices, which increases income and reduces bills. The game provides feedback and notifications on

[1] URL: https://www.ea.com/de/games/the-sims/the-sims-4/store/addons/the-sims-4-eco-lifestyle#related-news

sustainable practices and uses graphics and animations to engage players. It also features a point system that rewards players for their progress and encourages experimentation with different sustainable strategies. Overall, the game is an effective educational tool that showcases how digital games can teach sustainable practices.

PhoneStory[2] is a digital game that exposes the unethical practices of the smartphone industry, including child labour and toxic waste dumping. It takes players through the four stages of a smartphone's lifecycle, promoting critical thinking and awareness of the social and environmental impacts of technology consumption. Players are motivated to complete all levels and learn more about the industry's impact, making the game a fun and engaging way to encourage positive change in technology consumption. The game aims to encourage players to think critically about the impact of their technology consumption and act towards positive change.

4.1.2 Mechanisms that motivate players

Players are motivated by different factors when playing games. Progression and rewards give a sense of achievement, while competition motivates players to beat other players' scores. Social interaction in multiplayer games drives players to collaborate or compete with others. Immersive environments, compelling narratives, and engaging characters create emotional attachment and escapism. Challenge and skill-building motivate players to master a game, while exploration and discovery motivate players to uncover new content. Customization options and creative tools let players personalize their experience, while cooperative games motivate players to work together towards a common goal.

4.1.3 Real-life experiences incorporated in games

Digital sustainability games provide a more engaging and relevant learning experience for players by simulating real-life experiences such as energy conservation, waste reduction, and sustainable transportation. Players can experiment with different strategies and solutions in a safe environment while real-world data such as carbon emissions and energy consumption can be incorporated

[2] URL: https://phonestory.org/

to help them understand the impact of their actions. These games can also promote empathy and understanding of different perspectives by simulating experiences like living in a low-income community with limited access to sustainable resources. Incorporating real-life experiences and data can not only educate players on sustainable practices but also deepen their understanding of social and environmental sustainability issues.

4.1.4 Transferability of skills and experiences from games to real world

Digital games have the potential to transfer skills and knowledge from virtual worlds to real-world scenarios, particularly in sustainability education games. These games can teach practical skills related to sustainable living, such as reducing energy consumption and using public transportation. They can also enhance cognitive skills like problem-solving, critical thinking, creativity, and innovation as players strategize to manage resources sustainably. Sustainability education games can also create emotional connections to environmental and societal issues, motivating players to act towards sustainability in their daily lives. By transferring skills and experiences from virtual to real-world contexts, digital games can contribute to a more sustainable future.

4.2 Areas of use for sustainability games

Digital games provide an immersive and interactive learning experience for sustainability education, offering a safe space for learners to explore complex issues, experiment with different strategies, and receive immediate feedback. Games can transfer skills and foster emotional connections, motivating players to act towards sustainability.

5 Discussion

5.1 Implications of the findings for sustainability education

Digital games provide a unique opportunity for interactive sustainability education, as shown by the study's findings. Key game factors can enhance sustainability education and promote sustainable practices among students. They could be applied

in various subjects, providing educators with multiple options for incorporating them into teaching.

5.2 Challenges and opportunities for games-based sustainability education

Digital games have many opportunities for sustainability education, but there are also challenges to overcome. The lack of appropriate digital games addressing sustainability issues makes it difficult for educators to find suitable games. Additionally, educators need adequate training and resources to effectively use digital games in the classroom. Nevertheless, games-based sustainability education provides an engaging and interactive way to teach sustainability concepts and promote sustainable practices, and stimulate critical thinking and problem-solving skills, essential for addressing complex sustainability challenges.

5.3 Future research directions

This study offers insights into using digital games for sustainability education. However, more research is needed to better understand the best practices for designing and using digital games in the classroom. Future studies can explore effective game mechanics and content, digital games in various educational contexts, and the impact of digital games on student outcomes and behaviour change. Addressing these gaps can help educators enhance sustainability education and promote sustainable practices among students.

6 Conclusions

6.1 Summary of key findings

Digital games have potential for enhancing sustainability knowledge in education through effective game mechanics, incorporation of real-life experiences, and transferability of skills to real life. Furthermore, digital games have the potential to address sustainability concerns and promote sustainable practices.

6.2 Contributions of the study

This study highlights the potential of digital games for sustainability education and identifies key factors that enhance their effectiveness in an educational context. It contributes to both the field of sustainability education and educational game design.

6.3 Limitations and suggestions for future research

The study is limited by the lack of empirical data, but future research can explore digital games' effectiveness in sustainability education using virtual and augmented reality. New games can be developed and tested, and different game types' effectiveness can be studied. Overall, the study emphasizes digital games' potential as an innovative and engaging platform for sustainability education. Further research can build on these findings to create effective and engaging digital games that promote a sustainable future.

6.4 What comes next?

Future research can focus on addressing the limitations identified in the previous section to improve the effectiveness of digital games for sustainability education. This includes empirical studies to investigate their impact on enhancing sustainability knowledge and promoting sustainable practices among students, as well as exploring the potential of incorporating virtual reality and augmented reality technologies.

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What are the Young People's Perceptions of the Circular Economy?

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Abstract The circular economy is often seen as a technical issue and focuses on the better organization of work processes. A more accurate and holistic approach to the cycle can help create a better and more inclusive future for all. The circular economy has been linked to several SDGs in previous research, of which our research focuses on SDG 12 (responsible consumption and production). Young people play a key role in achieving a circular future (as an organizing principle of the socio-economic system). In our research, we asked 1,442 university students (most born around 2000) about their awareness, understanding, and participation in the social cycle using a standardized questionnaire. Our research shows that those who consider themselves environmentally conscious are more likely to recycle and collect separately, but it is not clear that they are involved in extending the life of objects (exchange, second market, etc.). Our research found that students don't use, but are typically unaware of, internet applications that promote circular living.

Keywords:
circular economy, SDG 12, holistic approach, lifestyle, consumer habits

JEL:
D12, I31

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1 Introduction

Changing the unsustainable logic of the global economy is the most important challenge of our time. The constantly and rapidly changing climate and the tensions arising from growing inequality on the human side make the responsibility of all economic actors clear (IPCC, 2022). There were also high expectations that COVID would make a positive difference to sustainability issues, but recent research shows that while there are temporary and partial results, there has been no significant change (Csutora et al., 2022b). The practical implementation of the concept of sustainability (UN, 1987), which is essentially macro and initially mainly related to the environment, requires interventions and conscious action at both micro and meso-levels, since the actions and impacts of actors are far from independent of each other and determine each other's potential. Nevertheless, the responsibilities of the different levels and actors are typically treated separately. This is how the theory and practice of corporate social responsibility (CSR) has been formulated on the corporate side (Carroll, 2008) and the expectation of conscious and responsible consumption on the consumer side (Csutora et al., 2022a). The authors show that the circular economy can be organized in very different ways (Bowens et al., 2020). In our research, we are mainly interested in how young people relate to circular economy processes. From this, we want to find out what a circular economy future might look like.

2 Theoretical Background

The circular economy may hold great promise for achieving sustainability (Szigeti et al., 2022). Much of the contemporary literature on circular economy (CE) presents the transition to CE as a simple, neutral process, implicitly characterized by a techno-optimistic and eco-modernist stance. Therefore, most research on the circular economy focuses on a practical and technical level, looking at the material and energy flows of production-consumption systems. However, the underlying worldview assumptions that need to be embedded in CE are largely ignored (Lowe-Genovese, 2022). Research by Bowens et al., (2020) develops four scenarios for the future of the circular economy, these are:

- 'planned circularity' – CE transition is centrally controlled by the government through strong coercive measures (taxation, bans, mandatory repair),
- 'bottom-up sufficiency', – focuses on small-scale CE solutions at local level,
- 'circular modernism' – technological innovation and market forces are seen as able to decouple resource use and carbon emissions from human development, is compatible with the concept of 'green growth', does not call into question the high consumption and growth focus and business models of significantly capitalist societies.
- 'peer circularity' – focus on technologies that enable collaborative consumption (e.g. internet platforms).

3 Methodology

Our questionnaire was based on the survey of Csutora et. al., (2022a). This previous research covered all sustainable business models, however, our research focused only on the circular economy. The questionnaire used for our research contains closed questions. The questionnaire was completed electronically by university students between 29 November and 13 December 2022. We received a total of 1442 completions. Of the students who completed the questionnaire, 48.3% were enrolled in a bachelor's degree in engineering, 15.8% in economics, the remainder being distributed among several courses (e.g. sociology, law, international studies, computer science in economics). Most of the students (83.9%) reached by the questionnaire, were born after 2000. In addition to the demographic questions, we asked 5 questions, of which we will now elaborate on the first one. The first question was: " To what extent do these statements apply to you?" There were 11 response options, which respondents rated using a Likert 6-point scale (6: very specific, 1: not at all specific). We use a 6-point Likert scale to avoid neutral answers. The respondent must therefore decide at the time of scoring whether he/she considers the statement to be typical or not. The answer choices listed below are indicated by a letter in brackets, e.g. (A). The answer choices in Table 1 and Figure 1 are indicated by this letter. Questions (A) and (K) show general statements, while questions (B), (C) and (D) show simple, slogan-like statements offered by consumer society. Statements (E) (H) (I) (J) refer to active participation in circular processes in

everyday life. And statements (F) and (G) refer to the use of internet platforms in circular processes.

Response options:

- I am environmentally conscious (A),
- recycling is important to me (B),
- I collect my waste separately (C),
- I do not buy products in disposable packaging (D),
- we swap personal stuffs, books, and clothes among friends (E),
- I am a member of online groups whose main profile is to facilitate swaps between members (F),
- I often swap items via internet platforms (G),
- I used to buy second-hand clothes (H),
- I usually borrow books from the library (I),
- I like to use recycled products (e.g. a bag sewn from used jeans) (J),
- I live frugally, I spend my money wisely (K).

Questions (A) and (K) show general statements, while questions (B), (C) and (D) show simple, slogan-like statements offered by consumer society. Statements (E), (H), (I), (J) refer to active participation in circular processes in everyday life. And statements (F) and (G) refer to the use of internet platforms in circular processes. Using the Likert scale, the ordering can be clearly clarified, but the distance between each response cannot be interpreted, so the resulting result can be interpreted as an ordinal scale, which determines the further processing possibilities. From the total sample, we examined separately the results of respondents who gave a score of 6 for statement (A), i.e. who considered themselves to be very environmentally aware. These results are shown in Table 2. Both the total population and the set of environmentally conscious respondents were analyzed using the positional averages, i.e., the mode and the median.

The median is the middle value of a data series, where the number of data smaller and larger than this is the same. Its value is equal to the 50th percentile or the middle quartile. It belongs to the group of central tendencies, within which it belongs to the group of positional averages. The concept of a mode indicates the most common

value of a data series. That is, the mode is the value that occurs most often in our sample. It belongs to the group of central tendencies, including positional averages.

After analyzing the answers to the first question, we decided to look at the question related to the most divisive item in our questionnaire (this is question 5, so we refer to it in the article). In the fifth question (this is a one-choice, closed question), we asked about the knowledge and use of online applications and web shops that could be relevant for the circular economy. These were:

- Munch: Munch is a platform where restaurants and retailers offer unsold but high-quality food at a discount (munch.hu)
- Háda: online store selling second-hand clothes, shoes, and accessories (hadawebshop.hu)
- Rukkola: an online book exchange site where you can earn points for donating books. And you can use the points to buy other books (rukkola.hu).
- Vinted: an online marketplace for second-hand clothing and accessories where you can buy directly from the seller. The online marketplace provides security for the buyer and increased turnover for the seller (vinted.hu).
- LiveRobe: An online marketplace for used, but brand new, premium clothing and accessories https://liverobe.com/.

The question was: 'Have you tried it?' And the answer options were:

- I have not heard of it,
- I've heard of it, but I don't know it,
- I've tried it a few times,
- I used it regularly.

The number of responses for each answer is shown in Table 3 and the distribution of responses in Table 4.

4 Results

There are many similarities between the results for the full sample (Table 1) and those who consider themselves environmentally aware (Table 2). As expected, those who are environmentally aware have a higher degree of self-perceived statements. Comparing the two tables, the most interesting situation is seen in statements (F), (H), (I), (J), where the median increased by 1 for the environmentally conscious but the mode changed from 1 to 6 (highlighted in bold). For (G), the median has been increased from 2 to 4, but the mode remains 1. If we look at Table 2, we can see that the second most frequent value in column (G) is 6.

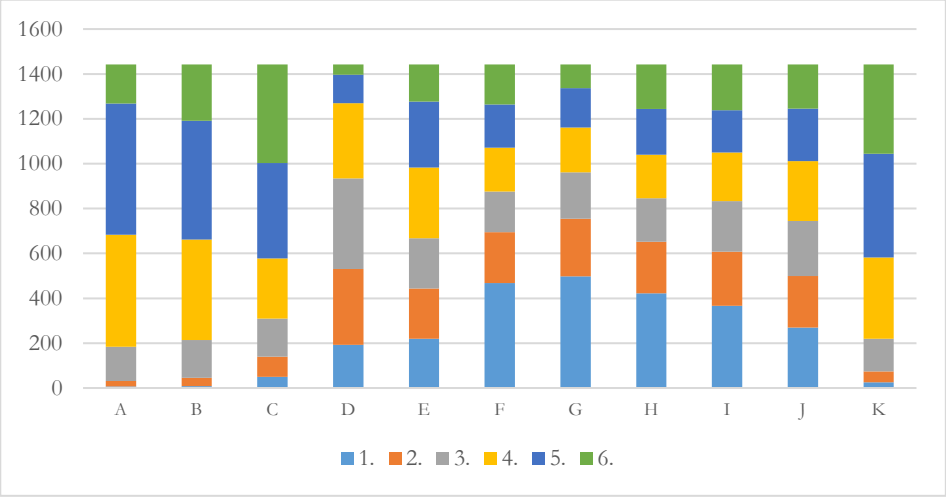

Figure 1: To what extent do these statements apply to you? (6: very specific, 1: not at all specific) (N=1442)

Source: Authors' elaboration.

Table 1: Response distribution to question 1 for the whole sample

	A	B	C	D	E	F	G	H	I	J	K
1.	7	8	50	193	220	468	498	422	367	270	25
2.	24	37	90	338	223	226	256	230	241	229	49
3.	153	169	169	403	224	182	207	194	225	246	146
4.	499	448	268	336	316	195	200	194	217	266	362
5.	585	529	426	127	294	193	175	204	188	235	462
6.	174	251	439	45	165	178	106	198	204	196	398
median	5	5	5	3	4	3	2	3	3	3	5
mode	5	5	6	3	4	**1**	**1**	**1**	**1**	**1**	5

Table 2: Response distribution to question 1 among environmentally aware respondents.

	A	B	C	D	E	F	G	H	I	J	K
1.	0	1	1	11	22	34	46	36	27	21	2
2.	0	0	0	12	15	15	18	21	20	13	3
3.	0	0	6	29	12	15	13	20	17	12	4
4.	0	8	17	59	46	36	25	25	25	31	16
5.	0	30	27	37	35	26	32	28	27	37	44
6.	174	135	123	26	44	48	40	44	58	60	105
median	6	6	6	4	4	4	4	4	4	5	6
mode	6	6	6	4	4	**6**	**1**	**6**	**6**	**6**	6

Tables 3 and 4 show that the students surveyed (with the exception of the Háda webshop) are generally neither familiar with nor use online exchange applications. Looking at the data in the tables, it can be seen that less than 5% of the applications listed are used regularly. Even in the case of the best known Háda webshop, the higher figure (24%) is related to infrequent users. Although it can be said here that many people are aware of its existence, even if they do not use it. LiveRob is hardly known among the respondents.

Table 3: Number of responses to question 5 of the questionnaire

	Munch	Háda	Rukkola	Vinted	LiveRob
I have not heard of it	832	222	931	660	1107
I've heard of it, but I don't know it	470	820	378	620	282
I've tried it a few times	108	345	107	114	38
I used it regularly	31	55	26	48	15

Table 4: Distribution of responses to question 5 of the questionnaire (%)

	Munch	Háda	Rukkola	Vinted	LiveRob
I have not heard of it	55	15	65	46	77
I've heard of it, but I don't know it	33	57	26	43	20
I've tried it a few times	7	24	7	8	3
I used it regularly	2	4	2	3	1

5 Discussion and Conclusion

Our research investigated which circular business model can be facilitated by the manifested consumer behaviour. Circularity is particularly important because it is not only one of the sustainable business models, but can also be an important

manifestation of responsible, sustainability-oriented consumer behaviour at the individual level (Szigeti et al., 2022). The results of our research show that young people consider themselves to a large extent environmentally conscious, participating in techno-optimistic processes (selective waste collection) that lead to a world of circular modernism. Bottom-up efficiency is clearly present in smaller groups, but its causes and forms need to be examined in more detail below. It is surprising that applications linked to exchanges and secondary markets are not known or used, so that the conditions for peer circularity are not yet in place. At this stage of the research, we can't draw any conclusions about planned circularity.

One of the main limitations of our research is that there are circular business models that can't be effectively investigated from a consumer perspective. The other limitation is that the questionnaire was distributed only among Hungarian students. Another limitation stems from the concept of circularity. As with sustainability, there are criticisms of circularity.

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ADVANTAGES AND CHALLENGES OF DEVELOPING A SUSTAINABLE SUPPLY CHAIN

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Abstract Nowadays, companies are expected to recognize their social responsibilities related to their supply chains. At the same time, it is essential to identify impacts on people and the environment because negative impacts can represent risks for businesses and society in various forms. Supply chains provide opportunities to decrease risks to the environment, and supply chain management can help decrease resource, energy, and transport costs. Companies are actively addressing significant sustainability impacts and risks by introducing sustainable supply chain management. In this paper, the author reviews the literature on the advantages and challenges that companies have to take into account while developing sustainable supply chains.

Keywords:
supply chain, supply chain management, sustainability, environment, advantages, challenges

JEL:
M11, M14

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1 Introduction

As consumers become increasingly aware of the social and environmental impacts of the products they buy, companies are under pressure to adopt more sustainable practices throughout their supply chains (Jo & Kwon, 2022). Sustainable supply chain management (SSCM) is a framework that helps businesses identify and address their supply chains' social, economic, and environmental impacts. SSCM is a holistic approach to managing the social, environmental, and economic impacts of a company's supply chain (Pagel & Wu, 2009; Sarkis et al., 2011). SSCM aims to create a sustainable supply chain that benefits all stakeholders, including suppliers, customers, employees, and the environment. SSCM involves identifying and managing risks and opportunities throughout the supply chain, from raw material sourcing to product disposal. It has become an increasingly important issue for companies as they seek to improve their environmental and social performance while still achieving their economic goals.

Several principles underpin SSCM (Anilkumar & Sridharan, 2019; Balon, 2020):

1. Transparency: Companies should be transparent about their supply chains, including the origin of raw materials, the conditions under which products are made, and the environmental impacts of their operations.
2. Responsible sourcing: Companies should source materials and products from suppliers who follow ethical and sustainable practices, including fair labor practices, safe working conditions, and environmental responsibility.
3. Resource efficiency: Companies should strive to reduce waste and use resources efficiently throughout their supply chains, from raw material extraction to product disposal.
4. Collaboration: Companies should work with suppliers, customers, and other stakeholders to identify and address social and environmental risks throughout the supply chain.
5. Continuous improvement: Companies should continually monitor and improve their supply chain practices, using metrics and reporting to track progress and identify areas for improvement.

Developing sustainable supply chains can bring numerous advantages, but it has challenges. This paper will explore some of the advantages and challenges of developing sustainable supply chains. The research method used in this paper is the review of literature focusing on the advantages and challenges that companies must consider while developing sustainable supply chains.

2 Advantages of Sustainable Supply Chain Management

Implementing sustainable supply chain management practices requires a concerted effort from all stakeholders in the supply chain. To implement SSCM, companies have to take some steps (Balon, 2020; Dubey et al., 2018; Novitasari & Agustia, 2021):

1. Conduct a sustainability audit of the supply chain to identify risks and opportunities.
2. Set sustainability goals and targets for the supply chain and communicate these goals to all stakeholders.
3. Develop sustainability metrics to track progress and measure performance.
4. Collaborate with suppliers, customers, and other stakeholders to identify and address sustainability risks and opportunities.
5. Use sustainability reporting to communicate progress and achievements to stakeholders.

Completing those steps and adopting sustainable supply chain management practices can benefit companies in several ways (Balon, 2020; Dubey et al., 2018):

1. Cost savings: Sustainable practices can reduce waste, increase efficiency, and reduce costs throughout the supply chain.
2. Reputation: Adopting sustainable practices can enhance a company's reputation, helping to attract customers and retain employees. Because of networking and digitization, consumers and civil society now find it simpler to track things back to their source. Moreover, communication technology allows for instant access to this information, for instance, through apps. Then, customers are in a position to see a product's place of origin and working conditions. The company can demonstrate to customers, the general public, and politicians that it is conscious of its duties, eager to

actively address critical sustainability consequences and risks, and ready to mitigate them to the greatest extent feasible by implementing SSCM.

3. Risk management: Sustainable practices can help mitigate the risks of supply chain disruptions, environmental disasters, and social unrest.

   Directly or indirectly, upstream processes—from primary production to specific production processes to transportation—act as value drivers. This way, careful resource selection and processing to create precursor goods improve product quality. Inhumane working conditions and severe environmental harm brought on by upstream processes, on the other hand, are signs of a risky, unreliable supplier and a lack of quality. Corporations are increasingly held responsible for the societal effects of their upstream operations. Hence, public crises and the resulting reputational damage can hinder economic performance.

4. Innovation: Sustainable practices can drive innovation, helping companies to develop new products and services that meet the needs of a changing market (Novitasari & Agustia, 2021).

   Costs of resources, energy, and transportation can be methodically collated with the help of supply chain management. When companies create their processes, such as logistics, more effectively and assist their suppliers in developing or enhancing management processes, these costs can continue to decline. Moreover, more effective systems and processes reduce the need for materials and, consequently, the cost of production. With higher production and fewer accidents, ethical occupational health and safety measures can also result in cost savings. By incorporating sustainability concepts into product creation, innovation potential may be increased. Working with suppliers to resolve these problems can also lead to the discovery of novel approaches to production and transportation.

5. Creating values collectively: According to Umweltbundesamt (2017), social responsibility is partly achieved because of SSCM.

   The UN has enhanced the sustainable management approach with the approval of the Sustainable Development Goals (SDGs) in 2015 for the years up to 2030. The SDGs can act as a "compass" for the problems we will face in the future and as a catalyst for innovation. More and more people want to see a better connection between entrepreneurial value creation and societal requirements. Nevertheless, this necessitates collaboration with other firms with comparable supply chains, nongovernmental organizations, and other actors within the company's own supply chain.

3 Challenges of Sustainable Supply Chain Management

As shown in Chapter 2, adopting sustainable practices throughout the supply chain can benefit companies in several ways; however, it is not without its challenges. The most common challenges in developing sustainable supply chains include (Balon, 2020; Prakash et al., 2022):

1. Lack of Awareness and Commitment: Developing sustainable supply chains requires a commitment from senior management and engagement across the organization. Many companies lack the awareness and understanding of the importance of sustainability, which can make it challenging to develop and implement sustainable practices. Moreover, sustainability often requires a long-term perspective and investment, which can be challenging for companies focused on short-term goals.
2. Complex Supply Chains: Supply chains are often complex and involve numerous stakeholders, making it challenging to identify and address sustainability issues. Moreover, many sustainability issues are interconnected, meaning that actions in one area may have unintended consequences in another. Taking a holistic approach to sustainability is essential, considering the entire supply chain and its impact on the environment, society, and the economy.
3. Regulatory and Legal Requirements: Many sustainability issues are subject to regulatory and legal requirements, making it essential for companies to comply with relevant laws and regulations. Compliance can be challenging, particularly in global supply chains, where laws and regulations vary across countries and regions.
4. Cost Considerations: Developing sustainable supply chains often requires investment in new technology, processes, and systems. While the benefits of sustainability can be significant, the costs of implementing sustainable practices can be high, particularly in the short term. Companies need to consider the financial implications of sustainability and balance the costs against the benefits.

These days, supply chains are frequently worldwide and comprise intricate networks. There are numerous supply chains due to the wide range of items. Companies should start realistically and move forward gradually. Finding areas with major sustainability benefits is the first milestone. A better understanding of the supply chain,

information sharing with other companies in the sector, and establishing connections with direct and sub-suppliers lead to an increasing number of choices and strategies for optimal sustainable supply chain management over time. Identifying actual and potentially significant effects on people and the environment is crucial. Negative effects might pose dangers for the company in a number of ways, including those involving the law, money, or reputation. It is essential to have precise local knowledge about suppliers and locations in order to assess significant consequences. In actuality, this is hard to come by and expensive. Hence, companies should concentrate on particular countries or leverage already-existing industry information on the effects of sustainability to produce helpful filters (Umweltbundesamt, 2017).

Obstacles may arise while promoting sustainability to suppliers. This is particularly true when there is little chance of influencing the supplier due to factors like low contract volumes, a lack of a direct contractual link, or client requirements. To jointly exert influence, businesses typically select direct exchange with their suppliers, maybe in collaboration with their customers. SSCM must be included in several existing internal procedures to be effective.

This may lead to conflicts with conventional procurement criteria like price, delivery date, and quality. Companies try to resolve these conflicts of interest through open dialogue. The value added by supply chain sustainability should be made explicit. SSCM involves more than just direct suppliers. Typically, companies start by contacting their direct suppliers, with whom they have binding contracts. The materiality analysis frequently demonstrates that the adverse effects start at the sub-supplier level. So, it is crucial to consider how sub-suppliers can be incorporated before taking any action. A code of conduct, for instance, can require suppliers to hold their own suppliers to the same standards.

Nevertheless, companies should refrain from merely shifting the obligations—and corresponding responsibility—to others. Data management must adhere to strict guidelines. Robust data from direct and sub-suppliers are required to be able to identify sustainability implications. However, managing data can be complicated. The data is likely in multiple forms, coming from numerous direct and indirect providers and starting in totally different systems (Chalmeta & Barqueros-Munoz, 2021; Prakash et al., 2022). This data must frequently be manually compiled, which requires expensive personnel. As there is no direct communication with sub-

suppliers, obtaining data from them might also be challenging. Estimating negative effects, particularly those related to emissions or water use, is frequently challenging. Industry-wide initiatives can be helpful here. Also, the materiality analysis should operate as a risk filter to locate areas with significant sustainability impacts.

4 Conclusion

Sustainable supply chain management is a framework that helps companies identify and address their supply chains' social, environmental, and economic impacts. Adopting sustainable practices throughout the supply chain can benefit companies in several ways, including cost savings, enhanced brand reputation, risk management, increased innovation, and improved supplier relationships. However, it has its challenges. Companies need to overcome issues such as lack of awareness and commitment, the complexity of supply chains, regulatory and legal requirements, and cost considerations to develop sustainable supply chains. Nevertheless, companies can improve their social and environmental performance by developing sustainable supply chains while still achieving their economic goals.

Implementing sustainable supply chain management practices requires a concerted effort from all stakeholders in the supply chain, including suppliers, customers, and employees. By adopting sustainable practices throughout their supply chains, companies can create value for all stakeholders and contribute to a more sustainable future.

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UNIVERSITY 5.0 FOR RESILIENCE - A SYSTEMIC APPROACH

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Abstract Within this study the author discusses Industry 4.0 and Industry 5.0 concepts. The author tries to prove that the achievement of resilience is given a special role. Achieving resilience itself has many challenges and is highly dependent on the effectiveness of the education system. The author notes that the educational links should be established between HEIs of developed and less developed countries. Resilience cannot be achieved without international efforts. This means that the joint initiative of several countries will not yield the desired results if this action does not take on a global character. Due to this, the technologies corresponding to Industry 5.0 will only give the desired results to the world when the technologies from the inventing countries are successfully introduced in the receiving economies. According to the author, close ties between the universities of the inventing and receiving countries ensure the achievement of the desired results in the shortest possible time. In this process, the author assigns a special role to the formation of the University 5.0 model. At the end of the paper, the author will schematically present systemic links between the inventing and receiving countries' universities in order to achieve resilience.

Keywords:
Industry 4.0, Industry 5.0, resilience, education, system

JEL:
A19, A29, I25

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1 Introduction

The Fourth Industrial Revolution conceptualizes rapid change to technology, industries, and societal patterns and processes in the 21st century due to increasing interconnectivity and smart automation. The discussion about Industrial Revolution 5.0 has recently started and has already becomes an active debate. Regarding this term, Muller (2020) argues that several of the ideas of Industry 4.0 seem to be revitalized under a new terminology. As is mentioned in the documents for the European Commission, Industry 5.0 complements the existing Industry 4.0 paradigm by highlighting research and innovation as drivers for a transition to a sustainable, human-centric and resilient European industry. Researchers predict that Industry 5.0 will help the formation of Society 5.0. This kind of big transition will require a number of policy actions in many areas, such as digitalization, education, taxation, energy, industrial policy, etc.

To respond to the title of the study, the author discusses the main challenges for building resilience, provides arguments for the role of education, and the possibility of educational systemic links. The author has developed a new approach to connect educational links from the new technology inventing countries to the receiving economies, with the self-designed graphical image. The paper ends with a number of brief conclusions.

2 Resilience – Brief Literature Review

In the Industry 4.0 paradigm, businesses have been forced to cope with increased uncertainties and adapt to cope with change (Potočan et al., 2021; Gagnidze, 2022; Sepashvili, 2020). That's why Industry 5.0 bolsters resilience for companies looking to balance man and machine.

Resilience is discussed in the scientific literature firstly as one of the main directions of economic development in the future and secondly, as the challenges of individual companies to achieve resilience. Traditionally 'resilience' meant cutting costs and preserving capital. According to the World Economic Forum and McKinsey & Company (2022) for the economy, resilience should be seen as the ability to deal with adversity, withstand shocks, and continuously adapt and accelerate as disruptions and crises arise over time. Grant et al. (2022) discuss the geopolitical risks at the level of companies.

As a response to the challenges of Industry 5.0, 'the Recovery and Resilience Facility (RRF) has become the cornerstone of the European Union's future-oriented strategy, as national Recovery and Resilience Plans set the investment and reform agenda to boost an inclusive and sustainable growth for the coming years' (EUR-Lex, 2022, 30). The RRF will advance large-scale investments and reforms in education that have the potential to make an impact in the medium to long-term.

The literary analysis on resilience shows that in order to effectively overcome the challenges, it is necessary to find such links that contribute to the achievement of resilience at the level of the economy, individual industries, and organizations. The author considers the education system in general and the modern model of universities to be one of these tools.

3 Methodology

During research on this topic, the author reviewed the relevant literature and studied documents, reports, surveys, and reviews from the European Commission and other international organizations and established research centers. In addition, synthesis and analogy, as well as descriptive and correlative methods were employed. In this case, under the term 'university', the author theoretically allowed a combination of scientific research, and higher and professional education, with effective dialogue with public authorities and business at local and international levels. Accordingly, they are a kind of connecting bridge in the implementation of goals set at the macro- and micro-levels of the economy to build resilience. Such an effective space to overcome resilience challenges can only be achieved in the University 5.0 model. This theoretical assumption is due to several reasons:

1. It is clear that all levels of science and general education must contribute their roles to the challenges of Industry 5.0, however, a detailed analysis of the issue is impossible since the format of this study is limited;
2. The paper will focus on the concept of University 5.0;
3. The descriptive model of the systemic approach describes the process in general, and considering the additional details, would have complicated it.

The author has developed a new approach to connect educational links from the new technology inventing countries to the receiving economies, with the self-designed graphical image.

With these foundations, this study aims to answer the following research question – Can University 5.0 play a systemic role in the process for building resilience?

4 Why Universities for Resilience?

Why University 5.0? 'University 5.0 is an integrated news, information, research, and consulting resource that explores the ways in which online education is fundamentally changing higher education. Its mission is to contribute to the national and international conversation about the pros and cons of online education in higher education, and to consult with relevant stakeholders in their efforts to effectively respond to the changing environment in higher education' (Alperstein & King, 2020).

This definition shows that the possibilities of the University and their sphere of influence are expanding significantly. Therefore, for the three reasons mentioned above in this study, it was assumed that the term 'education' is equated with the University 5.0 model. Accordingly, by education we mean all the processes that take place in the University 5.0 model.

It is important to note that the transition to the University 5.0 model will not be an easy process in many countries, because the formation of even the University 4.0 model in most countries is associated with great challenges. These problems are indicated by: Audretsch (2014), Etzkowitz and Zhou (2008), Dominici and Gagnidze (2021), Kharadze et al. (2021), Seturidze and Topuria (2020), Sobolieva and Harashchenco (2020), and Vesperi and Gagnidze (2021a). There are many studies that discuss the problems related to the change of the university model of individual countries, including: Sperrer et al. (2016), Vesperi and Gagnidze (2021b), Lekashvili (2019), Papachashvili et al. (2021), Gogorishvili & Zarandia (2021), and Kharaishvili et al. (2022).

Acquaintance with these works will convince the reader that a great effort in the direction of education will be necessary to achieve the goals of Industry 5.0.

5 A Systemic Approach

Resilience cannot be achieved without international efforts. This means that the joint initiative of several countries will not yield the desired results if this action does not take on a global character. Due to this, the technologies corresponding to Industry 5.0 will only give the desired results to the world when the technologies from the inventing countries are successfully introduced in the receiving economies. That is why it is important for building resilience to form systemic links between countries.

The main reason for presenting the systemic approach to the reader in the presented study is the properties of the system. One of them is the synergy effect. The interest of many actors participating in the system strengthens their own efforts, helping to create a solid network. By utilizing synergy and consistency, resilience can be achieved relatively easily. This is especially noticeable as a result of the establishment of effective international links of education and science (Gagnidze, 2018). This was the main reason to develop a systemic approach in the paper.

From Figure 1, which shows systemic links between inventing and implementing countries' universities, it can be seen that in the process of building resilience, international effort is very important. Accordingly, in the author's opinion, the attention should be focused on several aspects, namely:

- Inventing countries need to introduce and operate new technology themselves as well. Because of this, they also need to train people with scientific, higher, and professional education. The developed and less developed countries have the same goals in implementing technology. In this regard, systemic educational links should be implemented at least at three levels: scientific research, higher, and professional education. Accordingly, it is necessary for universities involved in the system to switch to the 5.0 model and harmonize educational programs. This process should start in the early stages of implementing a resilience plan. The potential of universities should be selected carefully;
- The effectiveness of the international educational system is determined by the strong connection and feedback between all participating universities. The accumulation and exchange of experience plays a critical role in minimizing errors and quickly achieving the desired goal;

– It is necessary simultaneously to start the activities in several countries to build the system. This should be planned well in advance, since any mistakes made will lead to a lot of time and money wasted.

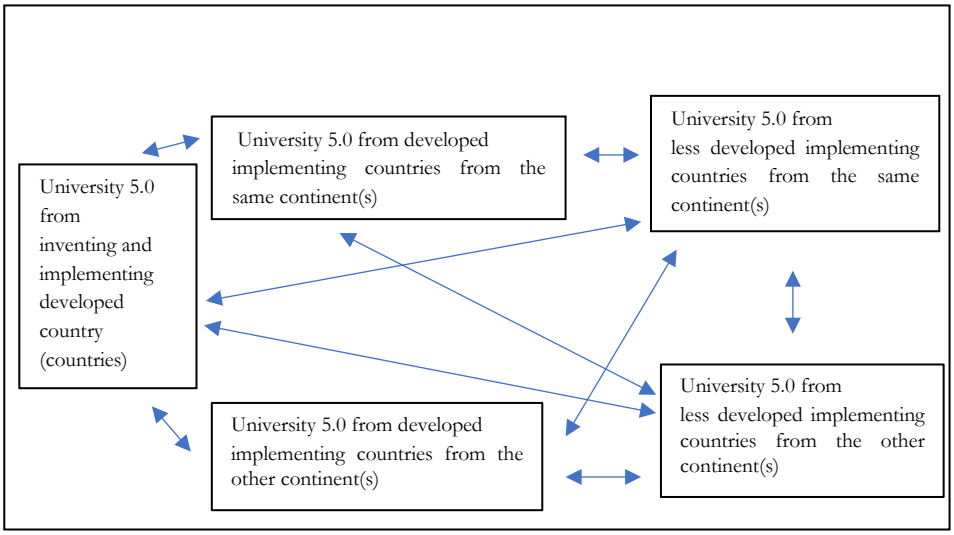

Figure 1: Systemic educational links between inventing and implementing countries' universities

Source: Author's eleboration.

Thus, by establishing international educational links and considering the above-mentioned emphases, the challenges for building resilience will be relatively easy to overcome. Based on all the above-mentioned issues, it can be concluded that the answer to RQ is positive, and University 5.0 can play a systemic role in the process for building resilience.

6 Disscusion and Conclusion

The paper concentrates on Industry 4.0 and Industry 5.0 concepts. The author discusses the challenges of resilience. Building of resilience is one of the three directions of Industry 5.0. Its provision is connected with a number of difficulties. For building resilience, the author places great importance on education. To simplify the systemic model, the main actors are the universities of the participating countries. In the author's opinion, it is necessary to establish the University 5.0 model in all participating countries. The possibilities and sphere of influence of such

Universities are very large. By combining them in the system, an effective network will be created. With a properly written plan, they can effectively promote and accelerate the building of resilience processes. The author also notes that the formation of such a university model will be associated with many difficulties.

The opinions given in the paper allow that the answer to the Research Question is positive. Given the scope of this paper, which represents limited desk research, it proves difficult to analyze the multifaceted picture of all levels of the educational system. In this regard, the Author made a theoretical assumption, according to which education is understood as such a university (University 5.0) where research, study, commercialization, and a high level of digitalization are in the same space. It should be noted that the commitment of the entire society is necessary to reach resilience, and therefore, all levels of education must contribute to it. Focusing attention on these and other challenges of resilience will be further developed in our future studies.

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DEFINING THE IMPACT OF NON-FINANCIAL REPORTING ON THE PROCESS, INSTRUMENTAL AND INSTITUTIONAL DIMENSIONS OF CORPORATE GOVERNANCE

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Abstract With the adoption of the Non-Financial Reporting Directive (NFRD) and the Corporate Sustainability Reporting Directive (CSRD), selected companies have to include and publish non-financial information in the course of their annual business reports (such as environmental and social matters etc.). This paper aims to determine the methodology and develop a research model to evaluate the impact of non-financial reporting requirements on the selected companies' process, as well as instrumental and institutional dimensions of corporate governance. Research methodology and research model will be defined in application with the MER model of integral management and governance (MER model). In connection with the MER model, this paper aims to contribute to the theoretical body of literature by developing a new research model using NFRD, CSRD, and EFRAG requirements to measure how non-financial reporting impacts process, instrumental and institutional dimensions of corporate governance. This paper also sought to illustrate the value and expected results of the future study when the research model is used in an empirical survey. A company must meet non-financial reporting requirements through all three dimensions of governance (process, instrumental, and institutional) to contribute to the company's long-term success, the well-being of society, and the achievement of sustainable development goals.

Keywords:
non-financial reporting, integral management, sustainability, corporate governance, MER model of integral management and governance

JEL:
M14, Q01, Q56

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1 Introduction

Due to several financial crises, environmental accidents, and employment matters recently, stakeholders and investors have raised concerns regarding corporate governance and corporate reporting. Especially in the last decade, corporate reporting has extended beyond traditional financial reporting including the reporting of non-financial information. In the first stage, this information was mainly reported voluntarily, mostly prepared based on guidelines delivered by different standards setters and organizations (such as GRI and IFRC). The content of this information included mainly the management and disclosure of risks and related policies. Over time, they have evolved to information concerning environment and social sustainability, business model, corporate governance, etc. (Cinquini & De Luca, 2022). With the adoption of Directive 2014/95/EU (hereinafter: NFRD), certain companies (entities of public interest with more than 500 employees) were obliged to report non-financial information as part of their year-end reporting. All countries of the EU adopted the NFRD, and selected companies had to report the first non-financial information for 2017. Due to several shortcomings of the NFRD, mainly related to comparability issues and auditing, the EU adopted the Sustainability Reporting Directive (hereinafter: CSRD). The CSRD introduced a more detailed reporting requirement, EU sustainability reporting standards (issued by the European Financial Reporting Advisory Group (EFRAG)) and extended the scope of companies obligated to report the information. In addition to the NFRD and the CSRD, the EU has adopted other legislation, such as the Directive on corporate sustainability due diligence (CSDDDD) and Taxonomy regulation. However, even though the EU has taken regulatory actions to increase sustainable corporate governance, the question remains whether the company's reported sustainability information is integrated into its governance structures. To prove this question, we focus on the determination of methodology and development of a research model in this paper to evaluate the relationship between non-financial information disclosure and corporate governance structure.

2 Literature Review

Corporate social responsibility was introduced in early 1950 with the book "Social Responsibilities of Businessman". In the book, H. Bowen addressed how much social responsibility can be rightly expected from a businessman by the public (Bohinc, 2016). Over the following years, the term has evolved into ever greater dimensions (Benn et al.,

2016; Carroll, 1979). By introducing new terms, various authors have emphasized that social obligation has become too broad to promote effective CSR management (Bohinc, 2016; Maignan & Ferrell, 2004). Based on content analysis of 37 definitions of SRD, Dahlsrud (2008) defined CSR as a specter of five dimensions: environmental, social, economic, stakeholder, and voluntariness dimensions. At the end of the 20th century, an international standard of social responsibility, ISO standard 26000, was introduced, showing the development and extended meaning of CSR in previous years (Primec & Belak, 2022). In this dynamic context, previous research has shown that non-financial reporting has been applied worldwide in the past decade. However, to achieve comparability of non-financial information, it was evident that there was a growing need for convergence among different non-financial reporting frameworks (Cinquini & De Luca, 2022).

In the EU, the concept of CSR was first implemented voluntarily with the aim that companies would integrate social and environmental matters into their governance by themselves. The financial crisis and the collapse of organizations showed that the voluntary concept of reporting was ineffective and that most companies did not provide a comprehensive overview of the risk they faced. Growing pressure was experienced from investors and standard-setting bodies toward the adoption of sustainable corporate governance (Dobija et al., 2023). Thus, the EU has introduced the NFRD, which made it compulsory for certain large undertakings and groups to report and manage their non-financial risks and opportunities. The NFRD consists of two parts. The first part presents the diversity policy. It represents the company's management or supervisory bodies regarding gender, age, or education. It includes the indication of the objectives, manner of implementation, and the results achieved by the diversity policy during the reporting period (Belak & Primec, 2020). Based on previous studies, diversity policy shapes the company's decision-making process and provides an essential driver of sustainable development (Dobija et al., 2023). The second part presents the non-financial statement. Companies shall prepare a non-financial report that includes at least environmental and social matters, employee-related issues, respect for human rights, and anti-corruption and bribery. Companies shall report policies, outcomes, and risks (Primec & Belak, 2017). In 2020, the European Commission published a document in which they emphasized that the NFRD has led the companies to change their strategies into a different, more social form of governance by including non-financial risks they encounter in their operations.

However, based on multiple studies, it was emphasized that the NFRD falls short in providing harmonized reporting due to integrated reporting and assurance and to excess possibilities for the company to diverge from reporting requirements (Parguel et al., 2011; Primec & Belak, 2022; Reddy, 2019). To resolve the identified shortcomings, the EU adopted the CSRD. The CSRD supersedes and complements the NFRD. Compared to the NFRD, the CSRD increases the number of companies that will be obliged to report the scope of the requirements and assurance. Companies will be obliged to report under the CSRD from the year 2025 on (the financial year 2024). To assure that the NFRD and the CSRD will meet the objectives set by the EU, it is, therefore, of high importance that sustainable governance is implemented in the whole structure of the company and its environment. The MER model on integral management and governance (hereinafter: MER model) is based on the multi-dimensional integration of control with the company and its environment considering the primary purposes of surviving and developing (Belak & Duh, 2012). The structure of the MER model is visible in Figure 1 and includes (Belak & Duh, 2012):

- integral management dimensions and special management which include process dimension, institutional dimension, and instrumental dimension,
- enterprise which includes the life cycle, developmental and growth cycle of an enterprise, objective, time and space dimensions, and its environment, which provides for economic environment, technological environment, sociopolitical and other social environments, natural environment, and cultural environment,
- key success factors of an enterprise which include credibility, ethics, ecology, efficiency, entrepreneurship, competitiveness, synergy, compatibility, culture, and philosophy.

The MER model defines that process, institutional, and instrumental dimensions have to be integrated into one holistic and complex cooperation process. All three integral management dimensions must be implemented at three levels of an enterprise: policy of the enterprise, strategic management, and tactical/operational management (Belak & Duh, 2012).

Figure 1: The MER model of integral management and governance
Source: Belak and Duh (2012).

3 Methodology

A research model for investigating the NFRD and the CSRD impact on the process, instrumental, and institutional dimensions of corporate governance was defined in application with the MER model of integral management and governance. Based on the prepared research model, it is investigated whether the NFRD and the CSRD provisions impact process, instrumental, and institutional dimensions in all three hierarchical levels (policy of an enterprise, strategic management, tactical and operational management) of a company. To this aim, seven categories were developed in the research model for the following groups of information:

- C1: companies' mission, purposes, and primary goals on the policy level,
- C2: corporate, general, and business strategies on the strategic management level,

- C3: implementation of policy and design strategies on the tactical and operational management levels,
- C4: description of the planning, organizing, directing, and controlling,
- C5: an overview of preparatory information activities, decision-making, and measures undertaken as process functions,
- C6: an overview of values, business and management guiding principles, styles, techniques, and management methods,
- C7: an overview of corporate governance institutions.

The first group (C1) of the information includes the companies' mission, purposes, and primary goals on the political level. Based on the research model prepared, it is investigated whether the company reported any sustainable-oriented mission, purpose, and basic goals (such as managing non-financial risk) in their annual reports. Further, it is explored in the second (C2) and third (C3) groups whether a sustainably oriented mission, purposes, and basic goals are also described as the basis of companies' strategies (corporate, general, and business) and how the implementation of the strategy on the tactical and operational management levels of the company is planned or was already executed. The fourth (C4) and fifth (C5) groups of the research model include the essential functions of planning, organizing, directing, and controlling, as well as the process functions of an overview of preparatory information activities, decision-making, and measured undertaking. Based on the research model, each essential and process operation will be investigated on policy, strategic management, and tactical/operational levels. In particular, it will be evaluated whether the company included basic and process functions in any of the above-mentioned hierarchical levels (policy level, strategic management level, and tactical/operational management level) when reporting non-financial information. The sixth group (C6) includes an overview of values, business and management guiding principles, styles, techniques, and management methods which the company reported in their annual reports to non-financial disclosure. Based on the research model, it will be investigated whether the company reported any styles, techniques, tools, instrumentation, and methods (such as policy, codes, semi-consolidated plans, guidelines, rules of procedure, etc.) concerning the management of risk and sustainability matters requested by the NFRD and the CSRD. The seventh group (C7) contains a description of corporate governance institutions. Based on the research model, it will be investigated whether the company described/reported any

governance institutions (such as committees for sustainable risks) and their functions to govern and manage sustainability matters requested by the NFRD and the CSRD.

The most suitable companies for the research are those that are committed to sustainability reporting following the NFRD and the CSRD. Hence the research model will be most applicable in the period from 2018 onwards (covering the financial year 2017) when companies had to start reporting under the NFRD. The empirical research will be conducted in two phases. In the first phase, the research model will be used to assess non-financial information published by selected companies in their annual or sustainability reports. Multiple case studies will be used since they enable the researcher to focus on specific examples or phenomena. Such a methodology aims to research and understand the real and reciprocal functioning of variables or events (Primec & Belak, 2022; Yin, 2016). Based on the information received from the annual and sustainability reports, sustainability reporting categories will be shaped and assessed. Each category of information will be assessed in two timeslots. In both timeslots, it will be evaluated whether the company reports the information requested per each of the above categories and whether the reported information complies with the NFRD and the CSRD. When the results for each time slot are prepared, a comparison analysis will be processed as part of the second phase of the empirical research. The comparison analysis will be made between the data reported in the first timeslot and the data reported in the second timeslot. The quality of information gathered from the results will indicate whether the quality of the information reported has improved. The quality of information disclosed shall be assessed based on content analysis. Content analysis grants replicable and valid inferences from the text and was used for sustainability reporting analysis in the past (Nicolo et al., 2020). Based on information gathered from the reporting and the usage of the research model, it will be examined whether the company complies with and reports the information stated in the categories described above.

Based on the research model prepared, we expect to answer the following designed research questions whether and how the NFRD and the CSRD legislation, in line with the MER model of integral management and governance, influence:

- the content of the vision, mission, purposes, and basic goals (within the process dimension); the core strategies, business strategies, and overall strategies (in the context of the process dimension); the tactical and operational level of the

implementation of policies and procedures (within the process dimension) of selected companies.

- the values and management principles and the application of styles, techniques, tools, instruments, and methods (in the context of the instrumental dimension) at the corporate policy level, strategic management level, and operational and tactical management level of the selected companies.
- the governance institutions (in the context of the institutional dimension) of the selected companies; the corporate governance institutions (in the context of the institutional dimension) of the chosen companies; the middle and lower management institutions (in the context of the institutional dimension) of the selected companies.

4 Results

With the development of methodology and implementation of the research model in practice, we expect to identify whether regulatory actions, such as the NFRD and the CSRD, influence corporate governance. In particular, the results will indicate how the provisions of the NFRD and the CSRD affect the corporate governance of companies in practice. The results will also show whether sustainability reporting has improved since the implementation of the NFRD and whether the adoption of the CSRD had any impact on companies' sustainability reporting in practice. We also expect that the results analyzed by the research model will indicate whether the implementation of the NFRD and the CSRD influenced the quality of corporate governance. The research model will enable the comparison of different non-financial reporting practices and their influence on sustainable corporate governance.

5 Discussion and Conclusion

In this paper, we briefly define a methodology and research model which can be used to determine and investigate the connection between non-financial reporting and corporate governance. To achieve the company's and its stakeholders' long-term success, sustainability and corporate social responsibility must be implemented in a company's corporate governance structure. This research model can provide valuable insights into companies' reporting in practice. Due to upcoming legislation changes, the research model also brings further insight into how legislation affects/changes non-financial reporting and sustainable corporate governance. To improve the results obtained from

the research, interviews may be conducted with the companies selected for the study as a second method to gather additional insights.

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THE USE OF BIOFUELS AS AN EXAMPLE SOLUTION TO ENERGY SECURITY CHALLENGES IN POLAND

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Abstract The aim of this article is to critically analyse the problem of expected changes in the field of energy security. The events of the war in Ukraine have brought the issue of energy security management to new levels of business, political and economic considerations. Energy security is most often understood as such a state of the economy that ensures that consumers' demand for fuel and energy is met - economically, technically and socially. Separate studies indicate that the supply of the energy system should be flexible and diverse. Any negative impact of the energy sector must be short-lived, minor and quickly minimized. The ongoing analysis and inference carried out by the authors of this article showed that the EU's intentions and projects, including in Poland, can be disrupted by the fact that each country develops its economy and manages energy in its own way. It was shown that biofuels will be an important element in ensuring Poland's future energy security. On such a basis of research conclusions, a practical implication was derived that, given the assumed costs of the energy transition and the requirements of the "Green Deal," preparatory activities should begin in the country now.

Keywords:
energy security,
energy security management,
renewable energy resources,
biofuels,
Poland

JEL:
H50, O13, O31

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1 Introduction

Contemporary state economy is not an isolated entity - it is largely dependent on international relations and a network of mutual relations. In this area, the energy stability of the state is one of the most important issues related to its national security. Therefore, the energy market is regulated by governments and is under their strict control (Yering, 2006; Mlynarski, 2011; Trubalska, 2015). Since the dawn of time, the security of energy supply has depended on many factors. Sample statements related to the functioning of the Organization of the Petroleum Exporting Countries (OPEC) and the oil crisis revealed in the 1970s made it clear that energy should be supplied from many sources. It was recognized that any negative impact of the energy sector must be short-lived and quickly minimized. This is the security aspect that must be maintained not only in a given macro-region, but also in each country and its economy (OPEC, 2023).

The war in Ukraine brought the issue of energy security management to new levels of business, political and economic considerations. It highlighted, above all, the need to become independent of Russian fossil fuels through the use of renewable energy sources. On such grounds Ursula Von der Leyen at the World Economic Forum, Davos 2023 announced "the beginning of a revolution in energy security." The meeting was held under the theme "Cooperation in a Divided World," and the basis for deliberations was the "Global Risk Report" (World Economic Forum, 2023). In her speech, the European Commission President noted that the European Union (EU) is approaching a geopolitical shock and an energy crisis, and "the next decade will bring the greatest industrial transformation of our time." She stressed that EU countries were the first in the world to launch the "European Green Deal," which has brought innovative investments in clean technologies in all sectors of the green transition. She made it clear that EU countries must take better care of their own clean technology industries.

The Green Deal industrial plan will thus have four pillars: regulatory environment, financing, skills and trade. The first pillar is about speed and access - the regulatory environment allows for the rapid scaling of operations and the creation of favourable conditions for sectors that are key to achieving the goal. These include wind, heat pumps, solar, clean hydrogen and energy storage. The second pillar deals with increasing financing for energy transition projects and public assistance. The third

pillar of the Green Deal plan is about developing the skills to achieve this transformation. The fourth pillar will address facilitating open and fair trade for the essential supply chain (World Economic Forum, 2023). In light of the above, the attention of all EU member states, including Poland, should shift from primary energy carriers (oil, gas, coal) to renewable ones. One such energy source should be biofuels.

2 Theoretical Background

Energy security is a multifaceted and very dynamic concept. This causes numerous difficulties in defining it. A uniform and common concept of energy security has not been developed so far. In the simplest terms, energy security is the possibility to access energy resources at any time, at an affordable price and guarantee of raw materials supply (Yering, 2006; Trubalska, 2015). The essence of energy security has also been defined by the United Nations as "the availability of energy at any time, in various forms, in sufficient quantities and at a reasonable price" (World Energy Assessment 2000; Elżanowski, 2008). In the Polish legal system, energy security has been defined in the Energy Law Act and is understood as the state of the economy that makes it possible to cover the current and prospective demand of consumers for fuels and energy in a technically and economically justified manner, while maintaining the requirements of environmental protection (Act, 10.04. 1997). In theoretical terms, energy security has two dimensions (Młynarski, 2011): "internal" (balancing demand and supply, taking into consideration the environment, consumers, as well as political and economic requirements) and "external" (filling the gap resulting from the difference between production and domestic needs).

3 Methodology

The purpose of the study was to identify the state and determine the direction of the expected changes in the area of energy security with particular emphasis on Poland. The available literature on the subject and data were used to determine the current state and dynamics of change in the energy sector. On this basis, the thesis was put forward that the production, generation and use of biomass can become an important element of improving energy policy both in the country and in the EU. Methodologically: an analysis and synthesis was applied for the theoretical background, normative material and new practices on the subject of challenges and

threats to energy security. Including with the use of biofuels. Data on EU intentions and projects were obtained from official international sources. This allowed further operations of abstraction, comparison and generalization. The final conclusion was a summary of own research. In this part, the officially established position of Poland on the directions of energy changes without slowing down the country's economy was used.

4 Results

At the core of its functioning, the Polish energy sector is largely based on hard coal and lignite (Poland, 2022). On one hand, this results in relatively stable electricity production. On the other hand, it means high levels of greenhouse gas emissions, including carbon dioxide, methane, nitrous oxide, fluorocarbons, perfluorocarbons and sulphur hexafluoride, into the atmosphere (Pioch, 2013).

In view of the EU requirements, since 2008, the country has been fulfilling the obligations of the "climate and energy package" (Strateg, 2023). Under this legislative basis, the signatories were obliged to carry out a thorough reform of the energy law, adopt the so-called emission obligations, and increase the share of energy from renewable sources in the entire production balance (Directive, 2003/87).

Failure to meet the requirements of the package may result in shutting down domestic power plants or extremely high financial penalties. The task of the Polish government should therefore be to strive for the intensification of scientific and research works and to create facilities for the development of unconventional energy sources, including solar, wind, hydro, geothermal, and biomass energy. Their use can bring measurable benefits in the field of environmental protection and reduce energy costs (Strateg, 2023). A separate problem in Poland is the poor technical condition of power plants. According to the preliminary assessment of specialists, more than 60% of domestic production capacity is technologically obsolete, decapitalized and ineffective. In addition, the lack of real capacity reserves in the "National Power System" poses a threat to the security and stability of energy supplies. Another major challenge is the necessity of constant transposition of the EU energy law into the Polish legal order (Sokołowski, 2002). This process is complicated not by problems with timely fulfilment of the implementation obligation or lack of social acceptance

for the harmonization of the law, but also due to the shortage of financial and human resources.

An equally important threat is the small territorial range and the high degree of wear of the transmission and distribution networks. The former is used to transfer electricity from the power plant to the grid, while the latter to supply it to consumers. The vast majority of them were built in Poland in the 1970s, and the constant passage of time reduces their technical condition. Their expansion and modernization are necessary, because due to the prevalence of weather anomalies, it is becoming more and more difficult to guarantee supply continuity.

A similar situation applies to natural gas and crude oil distribution networks, whose technical condition remains at the level of technology used at the turn of the 1960s and 1970s and requires urgent modernization. This results in a multitude of complications during the necessary renovations, maintenance, or construction of new infrastructure such as the need to pay high compensation benefits, obtain administrative decisions or carry out works based on much more capital-intensive technologies. An additional threat to the energy security of both individual citizens and the entire country appears in the absence of the owner's consent to enter the property during activities aimed at minimizing or eliminating emergency states. All this, also despite pressure from the EU, has not changed for years (Bartnik, 2014).

The most basic classification of biocomponents divides them into alcohols and esters. Among alcohols, ethanol deserves special mention. Others, such as methanol and butanol, are rarely used. Ethanol is an alternative fuel for low-pressure (gasoline) engines and can be used as a pure fuel (E100 = bioethanol) or as an additive to traditional unleaded gasoline in various proportions. Ethyl and methyl esters can be used as a substitute (B100 = biodiesel) or as an additive to diesel fuel, also in various proportions. Since biodiesel is an alternative fuel to diesel, that is, a diesel fuel, its production and consumption in Poland is by far the largest of all biofuels, due to the popularity of diesel vehicles (KN ORLEN, 2023).

Esters are used in public transportation, freight transport and agriculture. They take the form of an additive as well as a stand-alone fuel. In several Western European countries (Austria, France, Germany) and in Scandinavian countries, esters have

been a well-accepted solution for years. In Poland, the development of this fuel source became more pronounced only in early 2008 (Borychowski, 2012).

Meanwhile, the biofuels sector is occupying an increasingly important place in the energy policy of the European Union and individual member states. This is influenced by a number of factors, the most important of which are the availability and prices of raw materials for the production of biocomponents, crude oil prices and policies to support the supply and demand side. The importance of the biocomponent sector is emphasized primarily for ecological (environmental protection), economic (increases and strong fluctuations in oil prices), social (creation of additional demand for agricultural raw materials, which positively affects the development of agriculture and rural areas) and energy security reasons (Sobierajska, 2009).

Absolutely, therefore, the production and use of biofuels is the branch of the economy that should develop rapidly. The general benefits of their use include: their natural origin and renewable nature; the possibility of reducing oil imports and increasing energy independence; independence from oil price fluctuations and uncertainty about oil availability; activation of the countryside and rural areas through increased demand for agricultural products, and thus additional income for farmers; creation of new jobs at all stages of production and sale of biofuels and biocomponents; possibility to use surplus agricultural raw materials; reduction of emissions of carbon dioxide, aromatic hydrocarbons, nitrogen and sulfur oxides, phosphorus compounds, soot and solids (copper, iron) (Blażejewska, 2011).

On the other hand, domestic opponents of the use of biofuels emphasize their disadvantages: an increase in biofuel production forces the allocation of new land (including valuable and biodiverse land) for biomass production; monoculture of crops for energy purposes can lead to soil depletion and reduced resistance of plants to pests and diseases; a possible increase in the price of food produced from raw materials for energy purposes due to the competitiveness of the directions of raw material use (food production vs. biocomponent production); in the cultivation of raw materials, fuel is used for agrotechnical procedures and energy is used for the production of inputs (e.g. fertilizers); biofuel and biocomponent production processes require significant energy inputs, in addition to generating pollution (e.g. during fermentation of raw materials containing sugars); rising prices of agricultural

raw materials increase the cost of production of biocomponents and reduce its profitability; there are no complete quality standards for biofuels and biocomponents; biofuels have a lower calorific value and their consumption in the combustion process is higher; it is possible that vehicle mechanics problems may occur when burning esters, which increases vehicle maintenance costs (Biernat, 2010; Błażejewska, 2011; Borychowski 2011; Lach, 2013; Pioch 2013; KN ORLEN, 2023).

5 Discussion and Conclusion

The problem of anticipated changes in the area of energy security due to the wartime events in Ukraine has been brought to a very high level of theoretical and practical research. The EU's position here is clear - the negative impact of the energy sector must be short-lived, small and quickly minimized. The "Green Deal" industrial plan will help with this (Wold Economic Forum, 2023).

In Poland, the biofuels sector is developing and growing in size. However, this progress is uneven, as the biodiesel sector is at a much higher stage of development. This state of affairs needs to change. EU requirements are gradually increasing, so Poland should create a robust and absorbent market as soon as possible for the benefit of both producers and consumers of bio-components.

There is a practical implication: given the assumed costs of the energy transition and the requirements of the "Green Deal" in Poland, preparatory measures must be taken, and this includes the use of biomass resources.

However, each member country, including Poland, manages energy in its own way. This is due to various conditions (owned deposits, industrial production, long-term supply contracts and others). Therefore, Poland does not want to make revolutionary and financially demanding changes in energy security at the expense of slowing down its economy. In the long term, however, it is estimated that these measures will be necessary.

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SUSTAINABILITY MANAGEMENT IN THE LIGHT OF QUANTUM PHYSICS

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Abstract The purpose of the conceptual study focuses on the sustainability management in the light of philosophical, managerial and ethical implications of the basic findings of quantum physics. The methodology follows the current impetus of sustainability as a complex challenge related to economic, environmental and societal crises. The common denominator for the topic is a contextual perspective and comprehensive solutions in time. The older concept of CSR, for example, offered a concrete forms for the management of companies and organizations, while the newer concept of PRME and SDGs requires a deeper and broader background that provides better tools for educating of managerial responsibility for younger generation at business schools. The findings build on the managerial and teaching experience of the author and existing studies summarizing the current challenges of quantum physics in four dimensions: economic, social (anthropological), environmental and long term. The applications make use of the hitherto almost untapped concept of quantum physics, which formulates several essential philosophical, managerial, and ethical pillars for universal responsibility and sustainable Business and Management. The limitations are due to the wide range of discussion of quantum physics among physicists themselves, but the implications of the study point to obvious implications for sustainability management.

Keywords:
sustainability, management, quantum physics, ethics, SDG, PRME

JEL:
A12, A20, QO1

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1 Introduction

The emphasis on sustainability management in the 20th century is based on a conscious existential need for survival in modern crises and in the present and future. This paper demonstrates an overlooked correspondence with the natural philosophical and ethical implications of quantum physics. The philosophy of quantum physics has fundamental implications for sustainability management: to free modern science, and therefore economics and management, from the modern fragmentation of science, the reduction of social disciplines to isolated objects, deterministic and strictly causal analysis using mathematical formulas. Natural scientific approaches in economics and management have created the impression that the disciplines are capable of predicting future developments. These hopes, using economic models and experiments, have demonstrated only minimal evidence for the world's complexity and unpredictable future.

The field of management has started to use the term "sustainability" since the 1992 UN Conference in Rio de Janeiro (UN, 1992). The contribution of quantum physics is the current emphasis on universal context, interconnectedness and complexity of processes.

Some specific direction of sustainability management has found some specific CSR concepts, which have been transformed into specific PRME initiatives and reinforced by the recent emphasis on SDGs (SD, 2015) All this has shown in the last decades a completely new perspective to the classical concept of management, which business schools are still learning to cope with and to integrate the strategy adequately into their curricula and academic work. Even the EU developments show that some schools and countries have not understood and exploited the challenges. Especially the post-communist CEE countries even like to relativize them (Kučera, 2022). This is due to an overly entrenched emphasis on capitalism's utilitarian approach, profit and market economy, which sees consideration of the human and natural context more as a brake on the private interests of investors and owners of companies or shares. Moreover, the transformation economies in CEE are marked by the centuries-old influence of Marxism as a materialist starting point, which is in direct conflict with the idea of comprehensiveness, as well as the responsibility of management and government in all the aforementioned dimensions of sustainability.

In the following chapters, therefore, we will briefly introduce the philosophical impetus of quantum physics and its fundamental relevance to sustainability management.

2 Theoretical Background

2.1 The path to quantum physics

Among the main fathers of quantum physics are well-known figures such as Max Planck, Niels Bohr, Erwin Schrödinger, Max Born, Louis de Broglie, Wolfgang Pauli, Werner Heisenberg, and others. Quantum physics represented a departure from classical physics, whose representatives were, for example, Isaac Newton and Blaise Pascal. The discoveries and the subsequent scientific debate also gave rise to the philosophical treatment of quantum physics to which we will refer in the context of management reality (Omnès, 1999; Baggott, 2004).

For the purpose of the present study, we will only touch on some examples and relevant historical steps that we select to understand the basic differences and lessons for sustainability management.

2.2 Loss of versatility and complexity

We refer to the necessary overview of the historical development of sustainability strategy (Kučera, 2020) The ancient philosophy developed the sciences in the context of universality and universitas. The modern science changed the perspective reducing on strict rational, mathematical, and statistical methods (Galileo Galilei, Francis Bacon, etc.) Isaac Newton began to speak of "exact science". Francis Bacon (1561-1626) declared that such knowledge based on mathematics constituted a kind of “power”.

What we are seeing is a loss of universal concepts that have led primarily to new discoveries in astronomy, physics, chemistry, and biology (especially in the 19th century starting with Darwin). Contextuality and the social sciences, however, have been left behind. Even worse, they were negatively influenced by so-called "social Darwinism" (H. Spencer). The grand conception of the world, society and man has been displaced by the exact sciences and precise expertise. Above all, let us recall the absolute claim of the paradigm of mathematics, or mathematization as a scientific

method also in management. And here also begins the critique from the perspective of quantum physics (Weizsäcker, 1985). Wenzl, (1960) writes about the tension between mathematical fiction and physical reality, subject and objectivity. For management, a space opens up for thinking, analyzing and strategic planning from a certain ideal through reality to a potential future at a higher level of thinking that does not let itself be bound by strictly isolated statistical data and managerial applications based primarily on the natural sciences (see Figure 1).

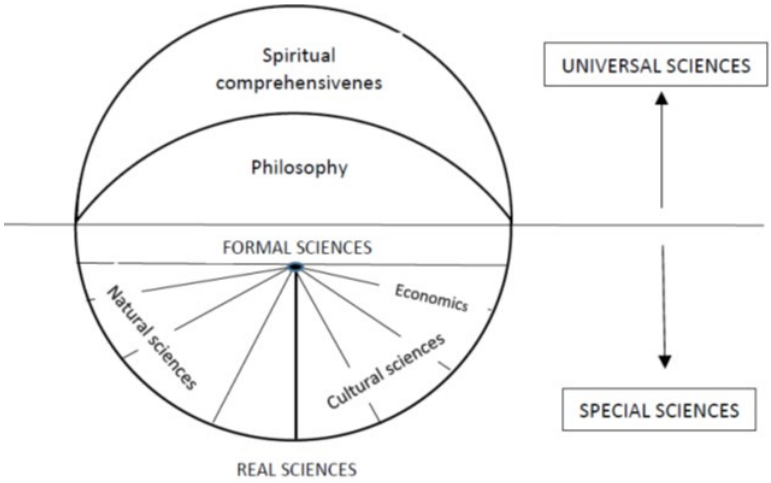

Figure 1: The division of scientific disciplines.
Source: Author's elaboration based on Anzenbacher (2002).

2.3 The emergence of the experience of the whole and the unity of the world

Classical physics introduced mechanical laws that found an adapted echo in economics and management: e.g. the laws of equilibrium, leverage, universal gravitation, inertia, force and interaction. Some originally purely physical laws have also influenced the social sciences and the concept of politics. Quantum physics has articulated the limits of any isolated mechanical phenomena in management in favor of a perspective of the whole, and sustainability.

The classical fragmentation of the sciences at the beginning of renaissance and modernism was replaced by the search for a "theory of everything". Classical theory was challenged by the theory of relativity and by reference to far more complex and

intricate processes in the cosmos and on Earth. Complexity, intricacy, and the need to account for various relationships, special conditions, quanta, waves, unpredictable motions, etc., entered simple models. Physics is discovering that at the microcosmic level, that is, at the level of elementary particles smaller than individual atoms, particles behave differently than in our everyday life. Finally: quantum physics demonstrates the limits of empiricism, determinism and statistics that management is so fond of using. Quantum phenomena are non-deterministic, non-deterministic, probabilistic and non-local (Schüz, 1986).

3 Methodology

The beginning of the study is the acquaintance with the works concerning first the foundations of quantum physics (Weizsäcker, 1985; Wenzl, 1960). We then focus on authors describing the implications of quantum physics. Finally, some references to the implications for management itself (Schüz, 1986). The sources used deal with chapters concerning the return to a unified conception of reality against the long-standing fragmentation and reduction of modern science - and also of management. Among the scholarly works, we find only isolated works in the field of management that relate to the connection with leadership and innovation (Zohar & Marshal, 2016), the importance of interdisciplinarity (Rigolot, 2020), the dimension of organization (Kilmann, 2011) and strategy (Messner, 2018), and computer science for distribution management (Gaily & Sándor, 2021).

3.1 Elements of quantum physics for management

Many quantum physics topics do not yet have a direct analogue in our everyday life and management. The term "quantum" refers to the smallest possible value of any physical quantity. In the microworld, the physicist observes the so-called corpuscular-wave dualism, according to which particles in the microworld have both particle and wave properties. For the sustainability management, this implies completely new challenges in the consequences for managerial philosophy.

According to quantum physics, for example, light can behave as both a particle (photon) and a wave. Light is not just a uniform stream that we perceive with the naked eye. Thus, it opens up completely different perspectives for perceiving the world and the philosophical consequences for sustainability management.

In quantum phenomena, for example, interference occurs, which describes a situation where two quantum particles with wave properties collide: the waves multiply. When the maxima with minimum waves collide, the waves cancel out. To make matters strange, there is a fundamental uncertainty relation in the microworld, it is referred to as the "Heisenberg uncertainty principle" (Ozawa, 2003). Its essence is that we cannot simultaneously measure the complementary properties of particles. Let us imagine, what it means for current management methods: The best known relation is the momentum (velocity) - position relation. If we make the measurement of position more precise, we make the measurement of momentum less precise (de facto impossible), and vice versa. For the claims of management, this implies a certain relativization of its expectations of precision and dominance through arguments and methods that do not take into account motion, time, changes in energy, conditions, and attitudes.

Other uncertainty relations include the time-energy relation, according to which we can never know both the time at which a particle was measured and its energy.

We know from quantum physics that every object in the universe has its own wave function. Using the square of the wave function, we can calculate the probability that a particle is in a particular state. Classical physics is deterministic, quantum physics is probabilistic. The nature of the reality of the microcosm is therefore random and open in quantum physics. The probability and the non-locality of quantum physics play a role. The question of what these phenomena mean for sustainability management will be the subject of further studies.

3.2 The new dimensions of reality

Max Planck opened the discoveries of quantum physics by showing that instead of individual parts, quanta play a role in reality. Light has been shown to be a flowing quantity in waves that have different inertial frequencies (like when we observe propagating circles on the surface of water after an object is thrown in). Even in reflection, light is quantum. Erwin Schrödinger (Mehra & Rechenberg, 1987) generalized: every particle has a wave function (position and time). Everywhere we find the probability of a wave, the location, its amplitude.

In the spirit of quantum physics, the German philosopher Georg Picht reminded us that we are responsible for everything within our range of possibility (Picht, 1985).

We are responsible for our thinking, decision-making and actions with implications for the near and distant future we do not know but influence. Whatever we do has an impact on people, the environment and also affects future generations. No statement or action is isolated.

Speaking of sustainability for the future, let us remind ourselves that physics also knows the negative role of time. Newly emerging orders abolish past ones. According to the first theorem of thermodynamics, the energy content of the universe is constant. Energy can neither be destroyed nor produced. We only change its form. Under the second theorem of thermodynamics, we know that some processes in nature are irreversible. It is impossible to recover heat from a cold reservoir without leaving noticeable changes in the surrounding environment. Entropy therefore increases with time and our actions. In management and economics we talk about resource limits. Entropy is universal! And we cannot turn back time. For management, this means an unimaginable increase in awareness of its responsibility and the importance of Business ethics (Schüz, 1986; 2001).

4 Results and Conclusions

The above-mentioned principles of quantum physics give rise to current suggestions for sustainability management context. It is primarily the problem of fragmentation of the modern sciences that management uses, which must be replaced by the concept of the whole and unity of the world. The knowledge of quantum physics about waves is in direct opposition to the inertia of classical management, which is still based on the concept of separate "particles" (fields, departments, disciplines, and specializations).

Applications in management must deal with the implications of new knowledge about complexity, context and continuity over time to the implications in the future in all areas. The quantum perspective on complexity leads us to a necessary rethinking of the long-standing narrow neoliberal focus on economic growth, individual data, empirical evidence and statistical methods that have overlooked the maintenance of existence and quality of life or social stability. In the perspective of quantum physics, the dimension of reality increases and opens up different probabilities and interdisciplinary interactions. Reality contains infinite possibilities of choice and combination. For management, this means a new level of tasks and ethical responsibility at all points of its activity over time and in various

transformations. The practical application of the theoretical understanding concerns the education of the young generation of managers and executive education. In this sense, the presented field awaits a lot of challenging scientific work.

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YOUTH CLUSTERS IN THE FIELD OF DIGITALIZATION

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Abstract This paper focuses on the new values of the digital age which impact the decisions of customers and influence attitudes towards technology and products. The research aimed to identify some typical groups among millennials. The research was carried out in Hungary and in Poland. We generalized the results based on their attitudes, feelings and behavior. According to the responses of more than 2000 young people this study presents the different clusters of the Y generation in their purchasing behavior and preferred digital values. We categorized them based on their opinions and profiled them using other demographic features. Environmental protection, health and safety were proven values and therefore important; digital solutions or the new products of industry 4.0 are examined in more in detail. With these clusters the economic role-players can gain insight into the differences between each consumer group and how to fulfil their needs regarding sustainable services and goods.

Keywords:
Y generation, digital values, sustainable services, Industry 4.0, smart products

JEL:
M14, M30

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1 Introduction

In the era of a changing environment, e-commerce, digitization and automation in line with Industry 4.0, it is important to learn about the expectations and approaches of the young generation. The new industry paradigm focuses on changing existing business models, company strategies, supply and value chains, business organizations, products and required skills. There is talk about the expected competences of managers and about combining technical knowledge with soft skills (Culot, et. al., 2020; Buchi, et. al., 2020; Santos, et. al., 2021). However, it is worth knowing the opinion of the young generation on available technologies and their approach to current solutions.

In recent years, great interest has been shown in achieving the Sustainable Development Goals and all the efforts made by NGOs, businesses and governments to reach these aims. The challenge is to create a comprehensive system in which all countries work together towards a sustainable world, which will allow economic development and solve social problems (Du Vall, 2019). The idea of Society 5.0 first emerged in Japan. This concept of a modern, future-oriented and human-centered society assumes, using the latest technologies, the integration of cyberspace and the real world. The idea of Society 5.0 is to help achieve the 17 Sustainable Development Goals (CAO, 2016). The purpose of the article is to verify the approach of young people to current technologies. It is acknowledged that people born before 1980 are classified as generation X, people born between 1980 and 1990 are classified as generation Y, while people born after 1990 are generation Z. The Pew Research Center report states that the Millennial generation (Y, Z) has a positive attitude towards all technological devices, while generation X does not (Ersöz and Askeroğlu, 2020). We can analyze in several areas whether we are looking at the digitization of political elections (Nemeslaki et. al., 2016), job searches (Bührer, 2017), or even booking leisure programs (Ehm et. al., 2022). Based on the results, the use of digital solutions has increased among young people - i.e., more and more people use them. Therefore, in this study the viewpoint of companies was our starting point in determining whether the development of sustainable digitalization can create value for the youth.

Our chosen research countries, Poland and Hungary, are European countries with many similarities. They both became parliamentary democratic states after 1989 (Sroka, 1995). Both countries are members of NATO and the European Union, and also members of the Visegrad Group. Political events in Hungary are often preceded by similar events in Poland. Likewise, they are both considering the introduction of the Euro currency, but still stick with their own (Kovács, 2005). The research was therefore conducted on a group of people who theoretically come from similar Central European countries. Based on this, it is confirmed that digital solutions represent value. We determined these digital values from the elements of Industry 4.0, which are supported by the use of smart devices and technology. In our research, we also asked about classic values as a reference, such as environmental protection, safety and reliability, which were proven to be valued almost regardless of age group.

2 Theoretical Background - The values of Industry 4.0

First of all, Industry 4.0 (I4.0) and electronic commerce should be defined as these two terms have the most direct relationship if we are analyzing the acceptance of the values of digitalization. I4.0 is the source of radical change, covering a wide range of innovative technologies, and all sectors and the value-creating activities that create value for young consumers are an intrinsic element of this.

The term Industry 4.0 first appeared in 2011 at the Hannover Messe fair (Geissbauer, et. al., 2016). It refers to cyber-physical systems, smart industry, Internet of Things (IoT), Big Data and hyper connectivity. Electronic commerce means managing the processes of buying, marketing, selling, distributing products and services over the Internet, and seeking to complete all transactions by digital means (Hitpass and Astudillo, 2019). Adopting technological trends influences the development of e-commerce at a significant pace (Baskaran & Rajavelu, 2020).

Industry 4.0 (Figure 1), often referred to as the "fourth industrial revolution" (Zhong, et. al., 2017), is an extremely complicated process and requires knowledge and determination to implement it (Woźniak, et. al., 2018). The fourth industrial revolution offers a great opportunity to build a competitive advantage for the entire European Union and its individual countries. The leading country in this respect is Germany (Stadnicka, et. al., 2017). The introduction of Industry 4.0 is supported at

a governmental level (Boyes, et. al., 2018) along with the recommendations given (Kagermann, 2015).

Additionally, it is believed that it is possible to talk about the next revolution, which is Industry 5.0. This focuses on using the creativity of human experts in cooperation with intelligent, efficient and accurate machines to achieve cost-effective production solutions compared to Industry 4.0 (Maddikunta, et. al., 2021). In addition to automation and digitization, Industry 5.0 focuses more on humans (Saniuk & Grabowska, 2022). This highlights one of the main aims of this paper, namely the need to draw attention to the attitudes of young people towards current solutions.

In Figure 1 we summarize our own views on traditional and digital values.

Traditional (classic) values	Digital values
• after sales services • the information about products available on the Internet • brand reliability • high quality assurance • environmental protection • quality standards • exemption from animal testing • use of recycled materials • own mobile application	• application of intelligent systems • the company communicates as an interactive system • the manufacturing company operates as a smart factory • automated warranty processes • application of modern technologies during production • innovative, developing company • only robots work in the company

Figure 1: Comparison of the traditional and digital values
Source: Authors' compilation.

Based on the above theoretical foundations, in the next chapter we summarize the results of our empirical work.

3 Empirical Research

The aim of our research was related to the above-mentioned values. Regarding the theoretical background we can deduce that we have both traditional and digital values. It was our aim to find ways to define the major groups, distinguish them and

profile them. Accordingly, the objective was to segment the Polish and Hungarian respondents based on our scale and explore the relations between segments, examining the effect of nationality and gender. The following research hypotheses were set:

- Respondents can be segmented based on their opinion relating to digital values, robotics and environmental issues
- There are differences between segments based on nationality
- There are differences between segments based on gender

3.1 Methodology

According to the literature review it is our assumption that people can be classified into homogeneous groups based on their opinion. We believe that there are statistically significant differences between groups based on gender and nationality. Thus, we tested the following theoretical hypotheses derived from our research questions:

H1: Respondents can be distinguished and grouped based on their digital related (and so on) opinion.
H2: There is a relationship between cluster membership and nationality.
H3: The gender and the cluster membership can be associated with each other.

To check the differences, we conducted a cluster analysis mentioned below, and to prove the distances between subsamples we used ANOVA. In every single case we found statistically significant differences.

3.2 Measurement and specification of scales and sampling

In our primary research we developed our own scale related to the previously mentioned values of digitalization. After some modification (one item was excluded in order to increase the Cronbach alpha value) we had 12 items, measured on a four pointed Likert scale, where 1 is totally disagree and 4 totally agree. Gender and nationality was measured on a nominal, non-metric scale.

We did a multi cross sectional research design. The empirical research was conducted in October 2019. We used the self-reported online questionnaire with convenient sampling method. All in all, we had 2966 respondents, and the ratios regarding the main variables were: 61.3% female and 38.3 male, 71.2% Hungarian and 28.8% Polish respondents. Our sample was not representative, but in this phase our aim was to explore the main phenomenon and gain some insight into this field. All of our recommendations and findings are true only in this sample, and we have discovered our limitations related to the response bias as well.

4 Results of the Cluster Analysis

As previously stated our aim was to segment our respondents based on their opinions. The advantage of this is that using or just knowing these groupings means we can handle them with different strategies. Our scale items are: (1) I look for the latest technology when buying new products. (2) I look for communication technology when buying new products. (3) When buying a car, I find it important for it to be equipped with different sensors (e.g., a parking radar system) because it increases my personal safety and I would pay more for it. (4) I am willing to pay more for antivirus software if it provides better protection than a free one. (5) I would support more robots being used in health care (for example, robots who help make appointments, arrange affairs or even perform surgery). (6) I would rather buy a product made by machines or robots rather than a human workforce. (7) I find e-books readers more practical so I use them instead of the traditional printed versions. (8) Self-driving vehicles and smart cars use technology to make driving easier and more convenient. For me this is a value that is worth paying more money for. (9) If I would use public transport with a card system that I could also use for other devices and services (e.g., public transport + bike sharing services) I would rather choose public transport. (10) I am willing to pay more for a product or a service if I am sure that the company makes an effort to be environmentally conscious. (11) I would rather buy a product if its packaging is environmentally friendly. (12) Electric and hybrid cars produce less harmful emissions. If I could choose, I would buy one of these due to environmental considerations.

To check the reliability of our multi-item scale we conducted the related analysis. The Cronbach alpha value was 0.637, which is acceptable. We conducted a factor analysis in order to define the main dimensions. (KMO: 0.682, Bartlett's test of

Spericity's sig: 0.000; extraction method: principal component analysis; rotation method Varimax with Kaiser). So our factors were: **novelty**, where we can find the variables number 1 to 4, **robotics and digitalization** (variable No. 5-9) and finally **environmental awareness** with the rest of the variables. However, no emphasis will be placed on this in the article, only on the cluster itself.

We use the factors to understand and profile the clusters, but additionally we checked the mean values of the original variables as well. Figure 2 shows the average values of our variables.

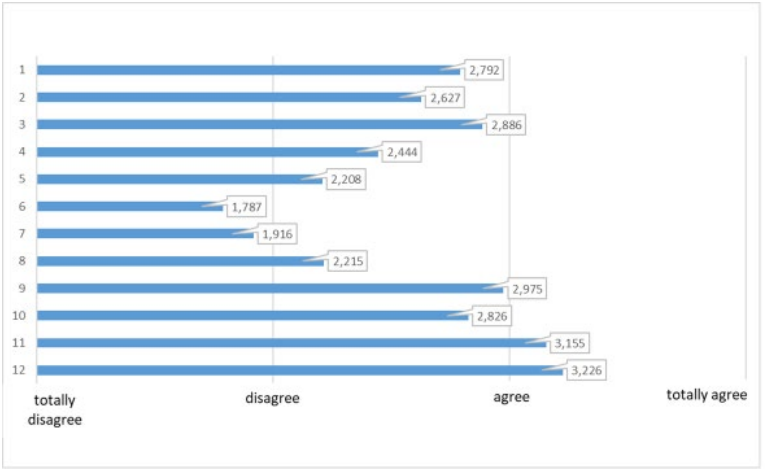

Figure 2: Average values of the variables
Source: Authors' compilation.

The highest agreement among the respondents seems to be regarding environmental awareness, then next regarding innovative technological solutions and the novelty of these concepts, whereas they express some doubts about robotics and digitalization. There is an exception in this last group where we focused on the considerations of the convenience of using the improved technology (Variable No. 9) as well as an agreement.

However, it is more interesting to examine in more depth and try to focus on the differences. So we conducted a cluster analysis (hierarchical, agglomerative cluster method, Ward linkage, with Squared Euclidien Distance used); and attempted to

profile them based on the mean values. We distinguished four different clusters, see Figure 3. To check the differences, we conducted ANOVA to analyze them. All of them are statistically significant.

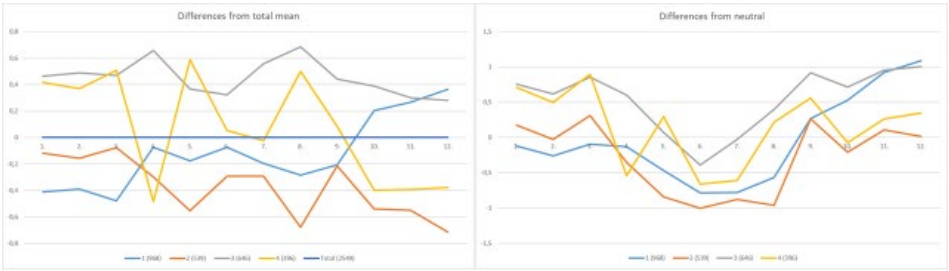

Figure 3: Differences from mean and neutral values
Source: Authors' compilation.

The first segment is the larger one, it contains more than one-third of the sample (37.98%, 968 people). Compared to the mean in respect of novelty, robotics and digitalization we have lower values but in relation to environmental awareness they are higher. Compared to the neutral status the product's novelty is less neutral; they disagreed with digitalization in its entirety, but their behavior related to environmental consciousness is supportive. We have named this group **Flower-Power**. Mostly Hungarians and female respondents can be found in this segment. We have statistically significant values in relation to nationality and gender associated with the cluster membership in every below mentioned case. The chi2 values are 48.343, sig.: 0.000 and 44.628, sig.: 0.000 and the contingency coefficients are accordingly 0.136 and 0.131, which is somewhat weak, but significant.

21.15% (539 people) of the sample belong to the second cluster. Compared to the mean they have lower values, and the biggest difference can be found in the case of car-related variables. Being environmental consciousness is less important for them; they have neutral opinions in almost in all cases. We call them the **Neutrals**. Mostly Hungarian male respondents can be found here.

More than quarter of the sample can be found in the third cluster. It is exactly 25.34%, 646 people. They are the opposites of the previous ones. Their values exceed the average; only in the case of human workforce vs. robots related variable

did they state a statistically neutral opinion. Everything which is digital or makes our life more comfortable is highly welcomed. We call them the **Digital Omnivores**. We can find mostly Polish and male respondents in this group.

The last and fourth group consists of 15.54% (396 people) of the sample. For them environmental awareness and security is less important, but regarding the digital offered comfort they have emergent values compared to the other groups. Accordingly, they are called the **Leisure-loving Digitals**. Again we can find Polish and male predominance here.

5 Discussion and Conclusions

Based on the results of our empirical research all of our previously mentioned hypotheses can be rejected, so

- we can distinguish consumer groups based on their opinion and attitude concerning the digital values,
- there are statistically significant differences between the clusters based on nationality,
- and gender.

According to the results we can handle the different groups in the correct way. As we can see we can find similarities and dissimilarities among the respondents related to digitalization. We have to recognize that not everyone is open-minded; indeed some are critical, and have crucial opinions about development.

Although our focus was on the young generations, surprisingly, we encountered young people who have almost the same values or attitudes as the older generations. Therefore, we can conclude that there are some traditional values that are deep-rooted and perpetual. Based on our empirical research the Polish youth are more open minded towards digital values, while the Hungarians still prefer the traditional ones. Although the two countries are similar, Generation Y in Poland is more focused on digitization and a conscious approach for the sake of the environment.

All in all, we distinguished those customer groups who can be targeted in a more specific way due to the information we revealed. To use a better segmentation strategy, we need to use a strong data-based system Specifically we profiled those groups where these digital values (as the result of digitalization in the field of Industry 4.0) are crucial. Thus, based on this, companies should consider using this insight in their product- or process development.

In our research we were faced with several problems and limitations. Although it was a multi-cross sectional study, we placed less emphasis on the Polish part. In addition, systematic response error can be mentioned as another limitation, due to the collection of data using a self-descriptive questionnaire. It is our assumption that, due to the pandemic, people nowadays possess more developed digital skills; therefore, attitudes must also have changed. On the other hand, our research is rather pioneering in its nature as no other studies as yet focus on digital and traditional values in quite this way.

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COAL BED METHANE: OPPORTUNITIES AND CHALLENGES IN INDIA

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Abstract Energy deficit countries like India are heavily reliant on importing fuel. If the fuel is harnessed locally, it can help the country reduce its import dependency and build a secure energy future. To cater to the energy demand, various renewable energy options are being looked into. One such fuel option is coal bed methane (CBM), which comprises methane trapped in coal bed reservoirs that can be extracted and used as a fuel source to meet energy demands. Methane is a combustible hydrocarbon with varied uses ranging from commercial industries to a commonly used household fuel. India has the fifth largest coal reserves in the world and can harness the entrapped methane from the coal beds seams. As per India's regulatory body, the Directorate General of Hydrocarbons, India has prognosticated 92 TCF (2600 BCM) in 12 states of CBM resources. CBM is a clean and unconventional fuel resource that may help tackle the fuel shortage for India's expanding GDP. And to meet the energy constraint of the growing Indian economy, the potential of CBM needs to be explored. This paper focuses on the overview of CBM in India and analyses the techno-economic challenges, including investment opportunities, policy limitations, and technological bottlenecks.

Keywords:
Coal Bed Methane, Alternate fuel, CBM technology, Environment challenges, Economic opportunities

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1 Introduction

Technological advancement and constant population growth have led to an increase in energy demand. As such, the reliance on fossil fuels will keep skyrocketing; currently, the global demand for fossil fuels is at 80% (IEA, 2022). Efforts are made to harness energy through unconventional sources to reduce fossil fuel reliance. Further, the inflationary price pressure due to geopolitical tensions also adds to the volatility of trade markets. The need for an energy-secure future has led to research and exploration activities in the renewable sector. And SDGs, the seventh goal to "ensure access to affordable, reliable, sustainable and modern energy for all" by 2030, is propelling the energy commodity market to scope out energy-efficient fuel options (*Goal 7 | Department of Economic and Social Affairs*, 2015)

One such option is natural gas which comprises methane. The extraction of methane from coal bed reservoirs is called Coal Bed Methane (CBM), wherein entrapped methane is desorbed from the coal bed matrix. It is a result of geochemical and biological transformations happening at the sub-surface level. The volatile organic matter of the coal gets degraded by a synergistic action by bacteria at the subsurface level at high pressure and temperature into gas. The gas produced is then extracted through drilling (Singh et al., 1999).

CBM represents a sizeable unconventional source of natural gas (Beaton et al., 2006). Countries like USA and Canada are leading global producers of CBM. In the USA, CBM accounts for 2TCF/ year, i.e. 10% of total gas consumption (Boger et al., 2014). India is an energy deficit country and, for its growing economy, has a very high dependence on the import of oil and gas. As per Petroleum Planning & Analysis Cell (PPAC), India's oil import for FY 2021-22 has been 84.4%. The Indian government is gearing up to reduce gas imports and set a gas production target of 50 BCM by 2023-24. Production of CBM internally can help to cater to the energy demand to some extent and thus can help to build a resilient economy for India.

2 Methodology

An extensive literature review is done from EBSCO, Scopus, and Google databases. Research on coal bed methane and its significance in India's fuel energy mix has been gathered for this paper. The extent of CBM and its associated challenges have

been identified. The nation's policy initiatives and the corresponding policy impediments have been discussed. The paper's main argument revolves around the CBM's potential to produce accessible energy that can be harnessed locally, reducing India's reliance on imports and advancing the country's sustainable transition to energy security.

3 Literature Review

3.1 CBM genesis and biogenic production

Anoxic conditions facilitate the generation of biogenic methane from coal as the result of complex biochemical reactions by groups of bacteria during the decomposition of organic matter (Krüger et al., 2008; Beckmann et al., 2011; Guo et al., 2012, Gründger et al. 2015). CBM is extracted by drilling boreholes into the coal bed reservoir and injecting it with produced water (Thielemann et al., 2004). The reservoir is depressurised due to the influx of produced water, and the methane gets desorbed and ready for collection (Reddy et al., 2022). Figure 1 shows gGeneration of methane gas during coalification.

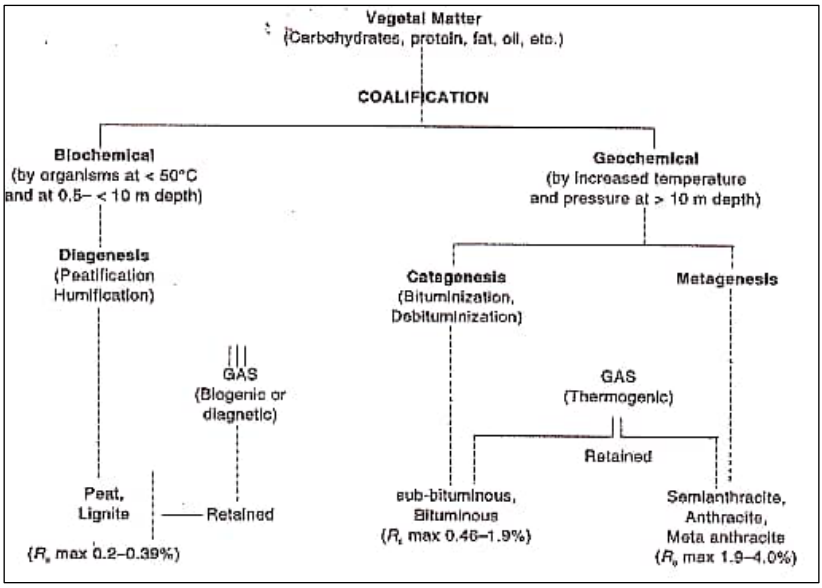

Figure 1: Generation of methane gas during coalification
Source: Singh et al. (1999)

Factors like coal type, rank, volatile matter, and fixed carbon affect methane adsorption capacity. Methane gas generation can get impacted due to coal maturity and rank, i.e. the deep-seated coal on maturation can generate more methane than shallowed coal bed (Ojha et al., 2011).

3.2 Economic opportunities of CBM in India

Methane sold in the CBM market comprises secondary biogenic methane, thermogenic methane, residual thermogenic carbon dioxide and heavy hydrocarbons. The value of the product by the manufacturer or creators of the goods is sold at 'factory gate' values to downstream manufacturers, wholesalers, distributors and retailers or, in some cases, directly to the end customers. Annual growth of 5.6% is expected in the CBM market for the year 2023 from its current size of $17.82 billion (*Coal Bed Methane (CBM) Market Size, Trends and Global Forecast To 2032*, 2023).

One of the significant CBM-producing countries is the US. However, the Asia Pacific region is expected to be the fastest-growing market. Countries like India, China and Indonesia are the major contributors to the growth due to the increase in drilling activities in these areas. Europe and Australia have been significant contributors to the market and are aggressively expanding to new regions (*Coal Bed Methane (CBM) Market - Global Summary & Outlook*, 2020).

India is one of the fastest-growing economies in the world, and its energy requirement to drive growth is also constantly growing. And to cater to this demand, domestic production should be prioritised, and sustainable alternatives must be explored. Meeting energy demand helps build a more robust economy for any country. India ranks fifth in terms of the largest coal reserves in the world. The coalfield beds that have the potential for CBM extraction are indicated in Figure 2.

India has set a target for natural gas to account for 15% of its energy mix by 2030, up from the current 6.7%, while the global average of more than 20% (*Government Sets Target to Raise Share of Natural Gas in Energy Mix to 15% by 2030 - The Economic Times*, 2022). In 2021, domestic gas production reached 32 BCM and catered to 50% of the consumption, lowering imports by 3.4%. Suppose the prognosticated 92 TCF (2600 BCM) of CBM resources can be optimised. In that case, it is estimated by the

Government of India that the total CBM production may be increased to 4MMSCMD (Million Metric Standard Cubic Meters per Day i. e. equivalent to approximately 1 TCF). The reserves are spread across the states as indicated in Table 1 by the Ministry of Petroleum and Natural Gas (MoPNG) *(EXP AND PROD - UN CONVENTIONAL HYDROCARBON | Ministry of Petroleum and Natural Gas | Government of India - Ministry of Petroleum And Natural Gas, 2019).*

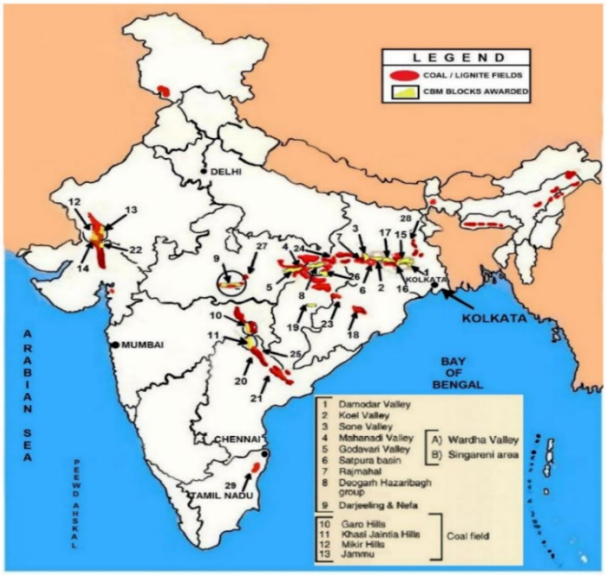

Figure 2: Classification of coalfields based on CBM potential, India
Source: Panwar et al. (2022).

Table 1: Total CBM resources by MoPNG, India

S. No.	State	Estimated CBM Resources (BCM)
1	Jharkhand	722.08
2	Rajasthan	359.62
3	Gujarat	351.13
4	Orissa	243.52
5	Chattisgarh	240.69
6	Madhya Pradesh	218.04
7	West Bengal	218.04
8	Tamil Nadu	104.77
9	Andhra Pradesh	99.11
10	Maharashtra	33.98
11	North East	8.5
	Total CBM Resources	2,599.40

3.3 Price trend of methane across the world

It is observed that the price of methane for developed countries is higher compared to a non-developed country which is mainly on account of taxation policy imposed locally. The US is an exception where the price of gas is kept low. The average price of methane worldwide is about 1.23 US Doller per litre (*Methane Prices around the World*, 2023).

Below is the price trend of methane in significant countries in UD Dollars per litre.

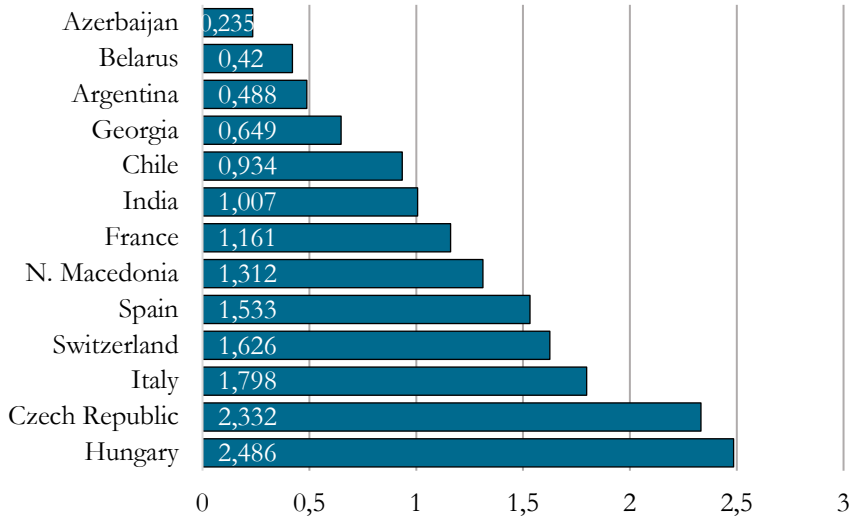

Figure 3: Country-wise methane pricing, Mar-2023 (litre, US Dollar)
Souce: Coal bed methane (2023).

3.4 Environmental challenges associated with CBM extraction

Management of the produced water associated with CBM production poses a primary environmental concern. The pressurised water is pumped into the reservoir to desorb the gas from the coal bed. And like conventional reservoirs, once the peak gas rate is achieved, the water saturates, and methane is then collected (Surya et al., 2008). During the process, the produced water discharged needs to be properly

disposed of as it has a potential impact on the surrounding habitats due to high salinity and sodicity levels (Mendhe et al., 2017).

As an industry practice, the produced water undergoes desalination, degassing, and removal of suspended solids, organic compounds, heavy metals, and others is carried out. After improvements and toxicity checks, the treated water can then be used for irrigation, deep well injection, aquifer storage, livestock watering, surface water discharge, and impoundment in infiltration ponds, evaporation ponds, or zero-discharge ponds. The treatment of the produced water incurs high expenditures, so the produced water's toxicity determines its usability. Therefore garnering public acceptance is challenging (Mendhe et al., 2017).

Nevertheless, the advantage of CBM extraction is that it helps capture methane, a potent greenhouse gas (GHG), thereby lowering GHG emissions. CBM capture also helps ensure mine safety, as methane in coal reservoirs has explosive tendencies. Methane is a potentially valuable alternative fuel used to produce electricity in transportation, such as CNG, and in various other commercial industries. Furthermore, if harnessed locally, it provides additional revenue, which can help bolster the country's fuel economy (US EPA, 2015).

3.5 Policy challenges in CBM extraction in India

While CBM has immense potential in India, the progress on CBM has been relatively low. The government had awarded 33 blocks in 4 rounds of bidding from 2001 to 2008, of which only five blocks have commenced commercial production. After 2010, new licenses for CBM exploration were not granted. At the same time, the gestation period for exploration, discovery, development, and production has a high lead time of over 5 to 7 years. With inherent long production cycle for any block to materialise, combined with the limited focus in the past by the government, has kept the development of CBM in India on a slow track (ETEnergyworld, 2022).

One of the significant challenges witnessed for the blocks awarded was land acquisition. CBM projects usually are spread across a large area of land. At such widespread locations, local and sociopolitical issue has significantly delayed the commencement of work. Another challenge observed is that the statutory approvals pertaining to clearance from Environment and Forest department and other local

authorities are delayed after the land acquisition. While the government had introduced the Single Window System wherein the interested organisation had to submit information for trade facilitation at a single agency rather than multiple agencies for faster implementation of projects, however, at the field level, it did not achieve its intent. Administrative challenges have also been observed between the petroleum and coal ministries as the CBM areas overlap the coal blocks. Mining license and joint approval challenges have become a bottleneck at the field level. The formula-based gas price fixation by the government, on many occasions, made the overall investment not economically viable.

Moreover, if levied, any imposition of tax similar to the Carbon Tax will be detrimental to the entire project. Without the flexibility of the gas pricing and the clarity on the taxation module, bidders have been conscious of investing in CBM in India. While India launched the auction of CBM blocks in 2021 with more liberal terms under the new policy initiative such as Hydrocarbon Exploration and Licensing Policy (HELP) and Open Acreage Licensing Programme (OALP), the result of the same is yet to be perceived (ETEnergyworld, 2022).

4 Discussion

It is of pivotal importance for India to increase its production of local fuel to cater to its growing energy demand and for a sustainable economy. Optimisation of CBM has to be among one of the critical areas of focus for the government to achieve its goal. While steps are being made towards the same, the following four strategy points need to be addressed for it to succeed.

i) Easy of operation and implementation

From awarding the CBM blocks to getting the site ready for production, it has to be executed in close coordination with the concerned authorities to ensure faster implementation and time reduction of a bottleneck at multiple stages during the process.

ii) Project viability

The pricing mechanism needs to be developed, keeping the global pricing trend and volatility of the worldwide trade market in consultation with the investors. This will help mitigate long-term and short-term setbacks associated with price inclusivity.

iii) Long-term sustenance assurance

In order to cater to the extensive CBM project timeline, measures need to be taken for the viability and redressal of any future challenges, including sociopolitical issues or geopolitical issues. Further, assurance is provided for the agreed duration of the project to ensure that it becomes viable.

iv) Clarity and transparency

Administrative challenges, pricing bottlenecks, and vague taxation policies must be addressed with more concrete and clear procedures. The policies should be transparent throughout the project duration, and the decision-making process from the investor's point of view should also be incorporated.

5 Conclusion

While CBM technology will continue progressing, India's policy environment will determine the field's purpose. The government will help draw in foreign investment if it takes a committed and targeted approach to the abovementioned issues. Hence assisting India in lowering its imports and supplying its own energy needs.

Methane's contribution to the energy mix could increase due to CBM. Compared to fossil fuel alternatives, methane collected using CBM is a cleaner fuel choice, containing 50–60% less carbon dioxide. If locally available resources are used effectively, imports can be reduced, aiding India's transition to an energy-secure future economy.

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Comparative Analysis of the Use of Wine Pouch Based on Sustainability and Consumer Resilience Aspects

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Abstract Wine packaging, which is one of the largest CO2 emitting areas of the wine market, is undergoing significant changes. Alternative packaging has appeared on the market and is expected to gain ground in the near future, replacing the classic glass bottles. The key research question is: how do different types of packaging influence wine purchasing decisions and what cognitive biases can be identified in the decision-making process? The aim of this paper is to investigate two alternative packaging formats, the pouch and the bag-in-box, from two perspectives: sustainability and consumer behavior. To carry out the sustainability analysis, we used data provided by a Hungarian winery, with the help of which we determined the production and transport emissions of pouch and bag-in-box. In addition to presenting sustainability indicators, we aimed to assess the level of resilience of these consumers in the wine market, using an experiment. The results suggest that Hungarian participants are resilient to use new alternative packaging types, but prefer bag-in-box packaging to pouches, which can be considered the novelty of the study.

Keywords:
wine market, alternative packaging, cognitive biases, resilience, sustainability

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1 Introduction

The role of food packaging is of growing concern from an environmental perspective due to waste management impacts, but it also plays a very important role from a health perspective, as packaging also serves to protect food (Ferrara & De Feo, 2020; Wikström et al., 2014). Nowadays, a number of packaging alternatives are available for drinks, such as PET (polyethylene terephthalate) bottles, bag-in-box, aseptic cartons and cans (Nesselhauf et al., 2017). The different types of packaging have also been studied in a number of academic studies from a sustainability perspective (Ferrara & De Feo, 2020; Ponstein et al., 2019; Gomes et al., 2019) and in relation to consumer behaviour in terms of purchasing decisions (Orlowski et al., 2022; Ruggeri et al., 2022). In our previous research, we examined the sustainability indicators of PET and single-use glass bottles, the results of which show that PET bottles are a viable alternative for lower and mid-range wines in terms of cost and CO_2 emission reduction. It is important to note that a glass bottles are considered less sustainable than PET bottles if they are not in a multi-pass system, i.e. it is not reused.

In the next part of the study, we present the sustainability background related to individual wine packaging, as well as consumer behavior based on the literature. After knowing the related background, we will present the two applied methodologies, then carry out the sustainability calculations related to the two types of wine packaging and the experiment measuring consumer attitudes. In this study, the aim is to investigate two alternative packaging formats, the pouch and the bag-in-box, from two perspectives: sustainability and consumer behaviour. By carrying out the experiment, we are looking for the answer how consumers perceive alternative packaging types and what is their resilience level?

2 Theoretical Background

The packaging industry has developed several alternatives for packaging wine, such as aluminum can, Tetra Pack, PET bottle, Bag in Box or Pouch. These alternative packaging types are lighter and more flexible than glass bottles, while glass bottles are heavier and more fragile (Gomes et al., 2019). To investigate how environmentally damaging each packaging alternative is, researchers often use Life Cycle Analysis (Ferrara & De Feo, 2020; Gomes et al., 2019). When considering the

environmental impact of different wine packaging, it is also essential to consider the environmental impact of transport. Logistics and global emissions from transport are major contributors to environmental pollution (Wild, 2021; Stojanović et al., 2021).

Product packaging is one of the most powerful ways to communicate with consumers, as it can influence consumer behaviour through perception. Since consumers most often do not have the opportunity to taste food, they often rely on external characteristics (shape, colour, size, etc.) (Orlowski et al., 2022; Spence, 2016). Parr (2019) examined the cognitive processes associated with wine and the perception of wine through the lens of cognitive psychology. During wine tasting, the colour of wine can also influence perceived flavours and aroma (Wang & Spence, 2019). Cognitive biases have also been observed in relation to wine packaging. Consumers tend to judge the quality of wine on the basis of perceptual characteristics. Several studies have concluded that wine bottles are associated with higher quality compared to other alternative packaging (Ruggeri et al., 2022; Ferrara et al., 2020). Hearnshaw and Wilson (2013) define resilience as the ability of a system to return to its original or even a better state after an unexpected event. In this case, this reflects the ability of consumers to adapt to changes in the wine sector (Forbes & Wilson, 2018).

3 Methodology

To approach the problem under study from the perspective of sustainability and consumer behavior, two methodologies were used. The sustainability aspect associated with alternative packaging (bag-in-box and pouch) is presented in terms of the CO_2 value of the products produced and the CO_2 emitted during the delivery of the products.

To carry out the sustainability analysis, a Hungarian winery provided the required data, through which the production and transport emissions of pouch and bag-in-box are described. As the wine market is changing rapidly due to environmental and other aspects, it is essential to assess the level of consumer resilience in this area. To investigate consumer attitudes and consumer resilience level towards alternative wine packaging, an experiment was conducted in January 2023 at Széchenyi István University in Hungary with a total of 330 participants. The scales used in the

experiment were adopted from the study by Orlowski et al. (2022). In this study only a subset of the experiments were conducted, showing participants only a picture of each alternative packaging type. For validation purposes, a pilot study was conducted with 23 participants. The aim was to explore whether the experimental method is appropriate for the phenomenon under investigation. Based on the participants' feedback, minor changes were made, but the method was found to be appropriate. In the experiment, the students were shown a picture of two types of wine packaging (pouch and bag-in-box), which they had to evaluate by means of a questionnaire. The two types of alternative packaging were from a Hungarian winery called Feind. To avoid distorting the label, a wine label from a foreign brand was also used.

Table 1: Study measures

Measure		
Traditionality	2 questions	6 point Likert scale
Familiarity	1 questions	
Purchase intention	4 questions	
Product Appeal	3 questions	
Taste expectations	3 questions	
Uniqueness	8 questions	
Demographic questions	4 questions	

Source: Orlowski et al. (2022).

The questionnaire used in the experiment contained a total of 25 questions. With the exception of the demographic questions, we used a 6-point Likert scale. The questions were grouped into a total of six categories: Traditionality, Familiarity, Purchase intention, Product appeal, Taste expectations and Uniqueness (Table 1).

4 Results

The carbon dioxide (CO_2) emissions from bag-in-box and pouch production were calculated using a combination of data from Ponstein et al. (2019) and Ecoinvent 3.4 using SimaPro software. In the analysis, transport data are taken from a specific winery in Hungary for the year 2023.

Table 2: Sustainability data for alternative packaging types

	Bag-in-box (5l)	**Pouch** (3l)
Product weight (kg)	5.20	3.10
Weight per package (kg)	5.20	18.80
Weight per pallet (kg)	749.00	475.20
Weight per truck (kg)	23,968.30	15,682.30
CO_2 per product ($kgCO_2$)	0.35	0.29
Weight per place (t/m^3)	0.26	0.17
Co2 per delivering weight (gCO_2/t-km)	32.69	49.96

Source: Data from a selected Hungarian winery.

Table 2 shows the characteristics of Pouch and Bag-in-box alternative packaging, such as weights and Co2 emissions. The above table contains the necessary data that can be used to calculate the CO_2 generated during transport. For truck transport, CO_2 emissions are calculated using the indicator "gCO_2/t-km", which includes the payload weight, the distance travelled and the CO_2 emissions weighted by these factors. In the case of wine transport, the problem is not necessarily the weight transported, but the lack of space, the goods to be loaded or the pallet's inability to carry the additional load. Thus, trucks may not reach their maximum load (ECTA, 2011), based on an average CO_2 emission of 783.50 gCO_2/km for a truck with a load of 13.84 tonnes, which corresponds to 56.60 gCO_2/t-km (ECTA, 2011). For the bag-in-box it was 32.69 gCO_2/t-km, while for the pouch it was 49.96 gCO_2/t-km. This means that the bag-in-box is more sustainable than the pouch in terms of transport. This is confirmed by the volume of litres transported, as CO_2 emissions per litre transported are lower for the bag-in-box than for the pouch. For the bag-in-box, 23,100 litres are transported per lorry, compared to 14,256 litres for the pouch.

The statistical analysis of the data from the experiment was analysed using statistical software. The data are not normally distributed, the test was performed with Saphiro-Wilk Index, which in all cases showed a result of p=<.001. The reliability of the uniqueness questions used as variables was tested using Cronbach's alpha, and the variables were found to be reliable (0.855-Hungarian; 0.850-foreign). Wine

knowledge did not correlate with any of the other wine packaging factors in the foreign test. In the case of the "foreign" test, traditionalism was weakly positively related to the other factors in the analysis of bag-in-box, meaning that the more traditional the participant found the BIB packaging to be, the more the other factors were positively related. In the evaluation of taste, the more positively the participant rated the expected taste, the higher the propensity to buy. The appearance of the BIB was positively and strongly associated with the expected taste. In the 'foreign' test, traditionalism showed a moderately strong relationship with willingness to buy, appearance and expected taste. Willingness to buy showed a positive moderately strong relationship with pouch appearance and expected taste. Furthermore, positive ratings of pouch appearance showed a positive and moderately strong relationship with expected taste. The uniqueness variable did not show a strong relationship with either variable, so participants who like unique things or are more open to new things were not more open to alternatively packaged wines.

Table 3: Analysis results in the case of the 'foreign' test

		Traditionality	Purchase Intention	Product Appeal	Taste expectations	Traditionality	Purchase Intention	Product Appeal	Taste expectations
BIB	Traditionality								
	Purchase Intention	0.241**							
	Product Appeal	0.326***	0.624***						
	Taste expectations	0.276***	0.593***	0.752***					
Pouch	Traditionality	0.583***	0.366***	0.360***	0.273***				
	Purchase Intention	0.332***	0.688***	0.393***	0.447***	0.522***			
	Product Appeal	0.398***	0.476***	0.525***	0.530***	0.541***	0.738***		
	Taste expectations	0.356***	0.478***	0.447***	0.565***	0.453***	0.729***	0.763***	

Source: Own research

Table 3 shows the results of the correlation calculation. Wine knowledge showed a weak and positive relationship with willingness to buy for the "Hungarian" test for BIB and Pouch respectively. In the case of the "Hungarian" test, the variable of traditionalism was weakly and positively related to willingness to buy in the bag-in-box evaluation of appearance and taste. For BIB, willingness to buy was positively and moderately strongly related to the appearance and expected taste of the product. Furthermore, the appearance of BIB was positively and moderately strongly related to the expected taste. In the case of the "Hungarian" test, the traditionality of the

packaging was positively and moderately strongly related to the willingness to buy, the expected taste and the appearance of the product. Furthermore, the purchase intention of the pouch was positively strongly related to the appearance and expected taste of the product. Product appearance was positively and moderately strongly related to expected taste. The uniqueness variable was weakly and positively related to both variables for wine packaging, meaning that more open participants tended to rate each attribute positively (Table 4).

Table 4: Analysis results in the case of the 'Hungarian' test

		Traditionality	Purchase Intention	Product Appeal	Taste expectations	Traditionality	Purchase Intention	Product Appeal	Taste expectations
BIB	Traditionality								
	Purchase Intention	0.160*							
	Product Appeal	0.261**	0.582***						
	Taste expectations	0.182*	0.545***	0.598***					
Pouch	Traditionality	0.321***	0.233**	0.394***	0.281***				
	Purchase Intention	0.154*	0.638***	0.358***	0.428***	0.438***			
	Product Appeal	0.268***	0.349***	0.446***	0.392***	0.510***	0.714***		
	Taste expectations	0.294***	0.453***	0.407***	0.550***	0.398***	0.691***	0.660***	
	Uniqueness	0.180*	0.188*	0.317***	0.264***	0.301***	0.220**	0.329***	0.215**

Source: Own research

Based on the Mann-Whitney test, there is a significant difference (p=<.001) between the two groups (Hungarian, foreign) in the perception of traditionalism with a power of 0.2968 for BIB and 0.1695 for taste expectations (p=0.006). For pouch, there was no difference between the two groups. Furthermore, uniqueness attitude showed a significant difference (p=0.042) with an effect size of 0.1243 (Table 4).

The analyses suggest that the perception of wine packaging as traditional packaging is related to other perceptional factors. A product perceived as traditional may be more acceptable in some cases than new things that are not yet experienced. Willingness to buy products is higher when the product is familiar, has more positive expectations and is attractively-packaged. The bag-in-box is an older alternative packaging method than the pouch, and therefore this type of product may seem more traditional to participants.

5 Discussion and Conclusion

The present study presented the CO_2 emissions and transport parameters (t/m3; gCO_2/t-km) of two alternative packaging options. The calculations show that the bag-in-box has better transport parameters and that the CO_2 emissions of bag-in-box packaging are lower compared to pouch. As a result of the experiment, it should be underlined that the BIB wine packaging was rather more acceptable than the pouch type packaging. Some practical, quality and aesthetic aspects can be responsible for this finding. The fact that the factor of traditionality is related to the other factors suggests that consumers are more accepting and more willing to purchase alternative packaging with packaging types that they perceive as more traditional. For this reason, overall, the level of resilience to the unpredictable among the participants cannot be considered high. To make it more comfortable and flexible for consumers to accept certain changes in the wine sector, it is necessary to increase their level of resilience. Further research is needed to facilitate this but informing and educating consumers can increase their resilience. As an avenue for future research, we will use data from wineries to demonstrate which of the single-way and multi-way packaging options is the most sustainable in the long term. In the light of the sustainability results, we will conduct consumer research among Hungarian consumers on their attitudes towards different types of packaging.

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CHALLENGES IN ESG RATINGS: UNDERSTANDING ESG RATING DISAGREEMENT AND ITS EFFECTS ON FINANCIAL DECISION MAKING

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Abstract The most widely applied indicators for sustainability are the Environmental, Social, and Governance (ESG) indicators, commonly used in academia and practice. However, these metrics lack standardization, resulting in potential discrepancies in performance assessments from different ESG rating agencies, referred to as ESG rating disagreement in the literature. Using ESG ratings from three different data providers for a sample of firms in the MSCI All Country Index for 2020, we calculated the ESG rating disagreement between Sustainalytics, Refinitv, and MSCI ESG scores. We applied quantile regression and provided evidence of a positive relationship between ESG rating disagreement and firm financial performance. Our findings contribute to a better understanding companies' ESG performance and the relationship between ESG performance and financial performance.

Keywords:
ESG rating disagreement, quantile regression, sustainability, sustainable finance, resilience

JEL:
C58, G15, G24

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1 Introduction

Sustainable finance is one of today's important fields in economics. The best-known sustainability indicators are the Environmental, Social, and Governance indicators, collectively ESG indicators, which quantify the sustainability performance of companies or countries. According to Svanberg et al. (2022), measuring sustainability is one of today's most significant challenges for the finance industry: assessing a company's sustainability with validity and accuracy. Sustainability is an elusive factor that cannot be measured in one dimension. ESG indicators are standardized sustainability performance assessments provided by third-party market providers, such as MSCI, Bloomberg, or Sustainalytics, which are applied in investment processes by investors.

Despite their wide adaption, ESG ratings are receiving criticism about their disagreement, confirmed by evidence in the literature. Companies can get significantly disagreeing performance assessments from different rating agencies, which causes several problems in investor practice and examining ESG indicators and corporate performance (Jacobs & Levy, 2022). In Amel-Zadeh and Serafeim's (2018) study, the practitioner's perspective is clearly described in using ESG data: they examined the barriers to ESG data use in the investment decision process, among other ESG data-related questions. Based on their results, the investors believe comparing reported information across firms is the biggest challenge to using ESG information for investment decision-making.

So far, the ESG-related literature has concentrated on the relationship between the financial and ESG performance of the companies (Naffa & Fain, 2020). Several studies separately examine the relationship between environmental (E), social (S), and governance (G) factors (Berlinger et al., 2022; Keresztúri et al., 2022), while Kotró and Márkus (2020) researched the relationship between the risk of corporate bonds and ESG scores. In addition to companies, sustainability aspects and expectations have also appeared at the regulators, so it is necessary to change the previous practices at this level as well; this was researched by, among others, Gyura (2020) and Mihálovits and Tapaszti (2018). The ESG rating disagreement is less researched; researchers have started studying this area recently. This paper aims to present the relevant literature on ESG rating disagreement and bring empirical evidence on ESG rating disagreement by calculating the ESG rating disagreement

on a sample of the MSCI All Country Index using ESG data from Sustainalytics, Refinitiv, and MSCI. We also examined the effect of ESG rating disagreement on financial decision-making with quantile regression.

This paper is structured as follows: first, we present in detail the relevant literature in connection with ESG rating disagreement, followed by the presentation of the research design, where we present in detail the ESG data used, as well as present the empirical results. Finally, we summarize the study.

2 Literature Review

In the literature, several researchers have examined the issue of ESG disagreement in recent years. Some researchers, such as Berg et al. (2022), Capizzi et al. (2021), and Chatterji et al. (2016), described the definition of ESG disagreement and the phenomenon itself. Billio et al.'s (2021) study focused not only on ESG rating disagreement and its investigation but also examined the impact of disagreement on ESG portfolio performance, such other studies as Gibson Brandon et al. (2021), Liu (2022), who examined the relationship of ESG rating disagreement on the financial performance and ESG disclosure of companies. The theoretical background of the ESG rating disagreement and the related issue is provided by Avramov et al. (2020), and Avramov et al. (2022) researched in detail, supporting their results with empirical models.

One of the studies on this topic is the study of Chatterji et al. (2016). They described that ESG ratings are essential in assessing companies' sustainable performance. They approached the disagreement by measuring the convergent validity of ratings by examining the pairwise tetrachoric correlations between the six indexes. They documented a need for more agreement across social ratings from six well-established raters. According to their results, it is mainly because of the absence of a common theorization and lack of commensurability. Billio et al. (2021) also analyzed the phenomenon of ESG rating disagreement and examined if it affects financial performance. They found a lack of commonality in defining ESG characteristics, attributes, and standards in defining E, S, and G components. They found that heterogeneity in rating criteria can lead agencies to have opposite opinions on the same evaluated companies and that agreement across those providers is substantially low. Their empirical results showed no impact on financial

performances; however, the ESG rating disagreement disperses the effect of preferences of ESG investors on asset prices.

Gibson Brandon et al. (2021) examined the relationship between ESG rating disagreement and stock returns. They used ESG data from seven different providers to assess ESG rating disagreement. Then they used a different panel regression model to analyze the relationship between ESG rating disagreement and stock returns. They calculated ESG rating disagreement based on investment practice, using the standard deviation of the available ESG ratings from the seven different data providers for a given firm at a given time. They calculated the disagreement measure for the total ESG rating and separately for the E, S, and G dimensions. Their findings suggest that stock returns positively relate to ESG rating disagreement, suggesting a risk premium for firms with higher ESG rating disagreement. This relationship is mainly based on the disagreement about the environmental dimension.

Berg et al. (2022) also focused on the ESG rating disagreement; however, they focused on the sources of the disagreement. They examined the ESG rating disagreement based on six prominent ESG rating agencies. They described the rating disagreement and mapped the different methodologies onto a common taxonomy of categories. Their results revealed that the sources of the ESG rating disagreement are the scope, measurement, and weight. Their results suggest that measurement contributes 56% of the divergence, scope 38%, and weight 6%.

3 Methodology

In our study, we conducted our empirical investigations on a global sample. Based on the MSCI All-Country Index, our sample included 2,752 companies. We built our database for the year 2020 from various sources. We accessed the companies' financial data via Bloomberg, using Refinitiv, Sustainalytics, and Bloomberg for the ESG data. We proxied the companies' financial performance with the one-year return and the maximum drawdown. Among the control variables were various financial indicators of the companies, such as market capitalization, ROA, long and short-term debts, Tobin Q ratio, volatility, and the Amihud illiquidity ratio. To calculate ESG rating disagreement, we used ESG data from three providers in our work, Refinitv's ESG score, Sustainalytics' ESG Risk score, and MSCI's ESG

ratings. Using these three ESG data, we calculated the ESG rating disagreement based on the work of Avramov et al. (2022). The calculation process is shown in Equations 1 and 2.

$$\left|ESG\ Rating_{i_A} - ESG\ Rating_{i_B}\right| / \sqrt{2} = ESG\ Rating\ disagreement_{i_{AB}} \quad (1)$$

where $ESG\ Rating_{i_A}$company i is the ESG score given by rating company A, $ESG\ Rating_{i_B}$company i is the ESG score given by rating company B, and $ESG\ Rating\ disgareement_{i_{AB}}$ESG rating disagreement for company i.

$$\sum_j^n ESG\ rating\ disgareement_{i_{XY}} / n = Average\ ESG\ rating\ disgareement_i \quad (2)$$

Where $ESG\ Rating\ disagreement_{i_{XY}}$the disagreement between X and Y ESG ratings of company i is $Average\ ESG\ rating\ disagreement_i$the average of the pairwise ESG rating disagreement for company i. The smallest value for this variable means that the three ESG service providers agree on their assessment. The largest value shows a large difference or large differences between the individual classifications.

We used quantile regression for the empirical analysis. While the OLS regression only shows the investigated relationship between the variables in relation to the average values, in the case of the quantile regression, it also shows the arbitrary quantiles of the conditional distribution of the dependent variable. With quantile regression, we can determine how much the effect of the independent variable differs in some parts of the conditional distribution of our dependent variable (Hajdu & Hajdu, 2013).

Based on this, we examined the following equations.

$$Q_\theta\left(Max.drawdown_{qi}|X_i\right) = \beta_{0\theta} + \beta_{1\theta}Average\ ESG\ rating\ disagreement_i + \beta_{2\theta}Size_i + \beta_{3\theta}Leverage_i + \beta_{4\theta}Tobin\ Q_i + \beta_{5\theta}ROA_i + \beta_{6\theta}Liquidity_i + \beta_{7\theta}Volatility_i + \varepsilon_{\theta i} \quad (3)$$

$$Q_\theta(One - year\ return_{qi}|X_i) = \beta_{0\theta} + \beta_{1\theta} Average\ ESG\ rating\ disagreement_i + \beta_{2\theta} Size_i + \beta_{3\theta} Leverage_i + \beta_{4\theta} Tobin\ Q_i + \beta_{5\theta} ROA_i + \beta_{6\theta} Liquidity_i + \beta_{7\theta} Volatility_i + \varepsilon_{\theta i} \quad (4)$$

4 Results

The relationship between ESG rating disagreement and corporate financial performance was examined using quantile regression. Table 1-2 shows the slopes of the conditional distribution of the various financial performance proxies fitted to different percentiles in order. In Table 1, where maximum drawdown was the dependent variable, the first column shows the companies with the lowest value, i.e., the most resilient 5 percent, showing the effect of ESG rating disagreement on maximum drawdown. In Table 2, the first column (p 5 %), in contrast to the previous one, shows the impact of ESG rating disagreement on one-year return and so on for the worst-performing companies. When maximum drawdown was the dependent variable, there was no clear trend in the coefficients, and the coefficient was significant only at the 95% percentile. This means that for companies with the highest maximum drawdown value, there is a negative relationship between ESG rating disagreement and maximum drawdown, i.e., if the uncertainty surrounding the company's ESG score increases by one unit, the maximum drawdown decreases by 0.164 units.

Table 1: Relationship between ESG rating disagreement and maximum drawdown, quantile regression

	(3)				
	p (5%)	**p (25%)**	**p (50%)**	**p (75%)**	**p (95%)**
ESG rating disagreement	-0.013	-0.003	-0.015	0.040	-0.164*
Bootstrap st. error	0.023	0.019	0.031	0.036	0.068
Control variables	Yes	Yes	Yes	Yes	Yes
Pseudo R 2	0.09	0.1528	0.1782	0.2132	0.2969
N	2752	2752	2752	2752	2752

Note: Estimation procedure: Quantile regression, Dependent variable: Maximum drawdown, Control variables: Market capitalization(ln), Long and short-term debts (ln), Tobin Q ratio, ROA, Amihud liquidity ratio (ln), 1-year volatility, * p < 0.10, ** p < 0.05, *** p < 0.01.
Source: Authors' research.

In the case of the one-year return, we can already observe increasing coefficients as we move from the 5% percentile to the 95%. In this case, the coefficient of ESG rating disagreement was significant and had a positive sign in three cases. This means

that the uncertainty around the company's ESG score increases the performance of those located at the top of the conditional distribution of the company's financial performance.

Table 2. Relationship between ESG rating disagreement and one-year return, quantile regression

	(4)				
	p (5%)	p (25%)	p (50%)	p (75%)	p (95%)
ESG rating disagreement	2.421	5.108	8.273*	19.549**	51.886*
Bootstrap st. error	6.479	5.563	4.604	7.908	27.142
Control variables	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.220	0.092	0.038	0.022	0.079
N	2752	2752	2752	2752	2752

Notes: Estimation procedure: Quantile regression, Dependent variable: One-year return, Control variables: Market capitalization(ln), Long and short-term debts (ln), Tobin Q ratio, ROA, Amihud liquidity ratio (ln), 1-year volatility, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Authors' research.

5 Discussion and Conclusion

Based on the results of quantile regressions, the relationship between ESG rating disagreement and corporate financial performance is not even; it is not the same throughout the entire conditional distribution. At the same time, the direction of the relationship is visible, even if the ESG rating disagreement coefficients are not significant in all cases. If the ESG rating disagreement increases, the company's financial performance also moves positively.

Our results are consistent with the work of Gibson-Brandon et al. (2021), who explained the results with the theories of heterogeneous beliefs and Knightian uncertainty. On the one hand, based on the heterogeneous beliefs theory, the ESG rating disagreement is priced into the stock returns in addition to the market risk exposure of the shares. Based on this explanation, if we consider the ESG evaluation of several rating companies and thus want to get a complex picture of the sustainable performance of the given company, then a possible ESG rating disagreement means increasing uncertainty regarding the ESG performance of the given company. Thus investors perceive it as a separate source of risk, which entails a risk premium if the investors are risk averse. In addition, Gibson-Brandon et al. (2021) also argued with Knightian uncertainty in their explanation, which in this case means uncertainty about the ESG performance of the given company, i.e., ESG rating disagreement.

Knightian uncertainty generally states that we do not know all the factors related to a possible event; there is a certain degree of uncertainty related to the given event, which we cannot quantify against the identified risks. Viale et al. (2014) applied this theory to stock returns and concluded that uncertainty is priced into stock returns. Therefore, ESG rating disagreement is a proxy for the uncertainty related to companies' ESG performance, which appears as a positive premium in stock returns, and our results support this.

Our study may help academics, investors, financial advisors, policymakers and regulators, and firms better understand that beyond the sustainability performance captured by average ESG ratings. It is recommended to look behind the aggregated scores and set up a set of criteria according to investor preferences, based on which we can say that a company is sustainable and we can compare more company performance.

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Local Government Financing and Sustainable Development: The Case of Albania

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Abstract Local government is one of the most important pillars of good governance of a society, an important indicator to express the essential role it has in the sustainable development (SD) of a country. The reforms undertaken in Albania in terms of increasing the fiscal and functional capacity of local government, connect it more and more with all components of SD. The use and maximization of the capacities of the local government in order to improve the basic goals of SD, is supported not only by the theoretical connection of functions but also by the experience of developed countries with a deep decentralization. In Albania, the local government receives revenues in the form of central government transfers and its own. These revenues are used by the local government to finance public services that have a direct impact on the lives of citizens but also to improve the quality of life. Both forms of local government revenue are at full discretion to be used by local self-government units and to improve measurable indicators of increasing the quality of public services and financing sustainable development.

Keywords:
local government, public economics, public finance, sustainable development, fiscal decentralization

JEL:
H71, H72, H77

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1 Introduction

After the 1990s in Albania, important reforms were undertaken to modernize local government, which aimed to bring governance as close as possible to the citizens. Over the course of three decades, important reforms and steps have been taken dedicated to local government such as: i) the adoption of the Constitution of the country in 1998, which sanctioned the organization and functioning of local government; ii) approval by parliament of the European Charter of Local Self-Government, in 1999; iii) territorial administrative reforms, as well as iv) laws and bylaws on fiscal decentralization and local public finances (Albania, 2016-2020). Decentralization in general and fiscal decentralization in particular, are an issue under constant discussion in almost all countries of the world (Dabla-Norris, 2006). Strengthening the financing scheme and increasing the role of local government in the implementation of many functions, is an important premise to promote the country's economic growth and sustainable development in all components of sustainable development.

In addition to more effectively managing local service provision related with goals of sustainable development, the local government units should be better placed to design and implement regional development programming (Imami et al., 2018). The stronger monitoring and evaluation capacity that might be expected from these units could likewise help with the "SDG localization", via the expanded use of SDG targets and indicators in local development planning (UN, 2021).

The territorial administration reform introduced large changes in the local governance landscapes in Albania, including providing broader competencies for local economic development, service provision, territorial planning, environmental management, land management, transportation, welfare, social care, and civil protection, and local information management (Toska & Bejko, 2019). In this respect, support for local government accountability in the following areas seems particularly important:

- Local public finance management. After the implementation of the Law on Local Self-Government Finances, local financing has start to fully implement the decentralized competences and expectations associated with the administrative-territorial and decentralization reforms.

- Streamlining local government structures to better reflect their distinct functions, performance targets, and human resources.
- Introduce local government performance standards to that can be applied across territorial administrations in the country, to guide and inform practices, norms and values and further enhance local governance approaches.
- Review the roles of local government in regional development, particularly in providing technical, planning, and coordination functions to support more effective territorial administration.

All the steps taken for local government in Albania in the framework of horizontal and vertical decentralization have created advantages in increasing the quality of implementation of SDGs by local government.

2 Literature Review

In public finance decisions, political risk is often the primary risk when assessing developing world opportunities (World Bank, 2002). At the local level, financial management faces the challenges of many risks which have a direct impact on the sustainable development of public policies. Many studies have been conducted with the pillars of sustainable public policy development, but the link between local government funding and sustainable development is an area not covered by analytical studies that help policymakers (UN, 2021).

Various studies have emphasized that real fiscal decentralization is very important for local government. By foreign and domestic authors, as well as by international institutions such as; The World Bank, OECD and the International Monetary Fund mention that Albania has made progress in fiscal decentralization (OECD, 2021), but there is still much to do. Increasing fiscal autonomy remains a challenge for the future as it is an important aspect of sustainable local development.

All studies determine that at the local government level, measures to further de-politicize public finance management are needed to strengthen public-sector accountability (UN, 2019). Measures in the following areas are recommended in support of this objective:

- Strengthening the cultures, ethics, and values on using the public founds, that characterize modern public institutions—particularly as concerns Economy-Efficiency-Effectivity public money using, transparency, and avoidance of even the appearance of conflicts of interest need significant attention.
- Acceleration the use of harmonized, results-oriented public finance management monitoring systems at local levels. Monitoring systems of public finance generally needs to focus on activity-, budget- and/ or output-based reporting, characterized by differing forms and procedures, and in some cases requiring multiple reporting of the same information.
- Introduce comprehensive public finance management in local level approaches within the civil service, which is professional and helps political decision to make better decisions with effects in live of citizens.
- Streamline and consolidate mechanisms for coordination, planning and reporting on public finance management.

3 Methodology

This study is based on primary and secondary data collected by author in official sources of the Ministry of Finance and Economy for 61 Municipalities in the Government Financial Information System (GFIS Treasury System), official information on fiscal indicators of local units provided by local self-government units and by INSTAT for the period 2016-2020. The data are processed by the author of the paper in order to be placed in the necessary format of the analysis of the relationship between funding sources and expenditures for the purposes of sustainable development.

As part of the study, in the paper is analyzed the importance that the elements of the financing scheme (of revenues) will take towards sustainable development (some of the SDGs at the local level). In this paper is examine the impact of factors such as: i) General Unconditional Transfer (GUT), ii) Unconditional Sectorial Transfer (UST) and iii) Own Revenue (OWR) (from local taxes and fees) to several components of sustainable local development (some SDGs at the local level). The SDGs that will be the subject of the study are: i) Quality of Education (E), ii) Sustainable Communities and Cities (CC), and iii) Climate Change (CLCH).

Through the multiple linear regression model, the aim will be to determine the strength of the relationship between local government financing variables and expenditures for financing the components of sustainable local government development.

3.1 Model specification

The main goal of Sustainable Development Goal (SDG) is to influence with public policies in Quality of Education, Sustainable Cities and Communities and Climate change. To study the relation between public finance policies in local level with SDG-se is created a model of multiple linear regression in SPSS Statistics.

This relation is a good indicator for measuring sustainable development as a results of public finance management in local level. A high level of correlation signifies a better level of development as a result of a well public finance management of local units, whereas low correlation implies weak level of development of SDG-s and local government unfunded. Financial inclusion is measured by the value of General Unconditional Transfer (GUT), Unconditional Sectorial Transfer (UST) and Own Revenue (OR). Based on the discussion the following model was developed. The model to be used is expressed mathematically as thus:

$$SDE + SDCC + SDCLCH = f\ (GUT + UST + OR) \quad (1.1)$$

The econometrics model is written as:

$$SDE + SDCC + SDCLCH = \alpha + \beta 1 GUTit + \beta 2\ USTt + \beta 3\ ORit + eit \quad (1.2)$$

To adjust for disparity in unit and measurement so that it can conform to the homoscedastic assumption as clearly stated in the multiple linear regression linear regression model. Where is constant, $\beta 1$, $\beta 2$ and $\beta 3$ are the coefficient of the independent variable in our case the 3 sources of revenues, while other variables remain as defined earlier. In determining the level of relationship in both variables, the study used different econometric techniques. The study used both Error Correction Model and Fully Modified Ordinary Least Square (FMOLS) to ascertain both the short-run and long-run relationship respectively among the variables. The math- empirical expression is represented as; $\beta 1 > 0$, $\beta 2 > 0$ and $\beta 3 > 0$ implying

that a unit increase in the independent variables will lead to increase in SDG-s by the value of the coefficient of the respective independent variable.

4 Research Results

In order to determine the level of connection between the indicators of local government financing and expenditures at the program level according to the goals of sustainable development, the authors have compiled some statistical data of the multiple linear regressive relation. The result will summaries four estimated models, which are the REM standard model, three generalizes least square (GLS) in estimating coefficient covariance. In this study we are focus on the three main tables you need to understand your multiple regression results, assuming that your data has already met the eight assumptions required for multiple regression to give you a valid result.

This study confirms a strong and direct link between the sources of local government financing in Albania and the three important pillars of sustainable development through ANOVA statistical indicators greater than the standard statistical level. It has also been shown that an increase in local government funding sources will have a direct impact on the increase in expenditures that go directly to achieving the objectives of sustainable development.

4.1 Statistic test of variables

By using the SPSS Statistics, we have generated quite a few tables of output for a multiple regression analysis. In this section, we show only the three main tables to understand the results from the multiple regression procedure, assuming that no assumptions have been violated.

The Table 1, of the econometric model is the Model Summary table, where is reported the strength of the relationship between the model and the dependent variable. With this table we provide the R, R2, adjusted R2, and the standard error of the estimate, which can be used to determine how well a regression model fits the data:

Table 1: Model Summary[1] table

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.993[a]	.986	.986	9223.37203	.986	3389.759	3	57	<.001

Source: Author's calculation in SPSS Statistics, 2021;

Based on the analysis of the above indicators we understand that the indicator "R" or otherwise multiple correlation which measure the quality of the prediction of the dependent variable; our case the sustainable development Goals. As it mentions in the table, a value of 0.993, in this example, indicates a good level of prediction. This indicator clearly expresses the level of forecast that the link of these indicators will give on the impact of financial management at the local level on the acquisition of important indicators of sustainable development. On the other side, R2 value which is the proportion of variance in the dependent variable that can be explained by the independent variables (technically, it is the proportion of variation accounted for by the regression model above and beyond the mean model). You can see from in our study the value of 0.986 that our independent variables explain 98% of the variability of our dependent variables which are the expenditures of 61 local government units for every goal.

The F-ratio in the ANOVA Table 2 tests whether the overall regression model is a good fit for the data. The Table 2 shows that the independent variables statistically significantly predict the dependent variable, $F(4,95) = 3389.759$, $p < .001$ (i.e., the regression model is a good fit of the data).

Table 2: ANOVA[a2]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10741917017039.210	3	3580639005679.737	3389.759	<.001[b]
	Residual	60209713977.997	57	1056310771.544		
	Total	10802126731017.207	60			

Source: Author's calculation. in SPSS Statistics, 2021;

[1] Predictors: (Constant), OWR, UST, GUT
[2] Dependent Variable: SDE, SDCC, SDCLCH
Predictors: (Constant), OWR, UST, GUT

The Table 2 with ANOVA results shows that our study confirms on this study the strong link of forecasting that local government expenditures have for the purposes of sustainable development to the main sources of local government funding.

5 Discussion and Conclusion

Based on the Literature Review on this issue, it results that theoretically there is a strong connection between local government financing and sustainable development. From the research of literature and cases of different countries it results that, mainly in developed countries there is a strong connection between local government financing and sustainable development. This connection is mainly found in western countries with stable democracies and sustainable economic development and potential. Within this group of countries that focus on environmental development, the link between local and regional funding and sustainable development is stronger.

The study shows that in Albania currently there has a low level of fiscal decentralization related to the objectives of sustainable development, despite the fact that the relationship between them financial management and SDG-s in the econometric study is strong. An increase in the future level of local government revenues not only from central government transfers but also its own resources would progressively increase the impact of local government on the quality of implementation of sustainable development goals.

The study highlights the need for policymakers in Albania to design and develop real and complete decentralization processes associated with financial needs and investment in human resources in order to increase the absorption power of competencies from local communities and good local governance in favour of increasing local community's welfare.

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IDENTIFICATION AND SUSTAINABILITY STUDY OF LMS FOR TEACHING AND LEARNING OF FOREIGN LANGUAGES

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Abstract Educational learning management systems (LMS) are essential in foreign language learning. With the help of information technology, companies and educational institutions have substantially transformed their learning process. This was caused by global competition, Covid -19 virus pandemic and environmental concerns. The paper aims to investigate LMS used for teaching and learning languages and their impact on the natural environment. In general, an eco-friendly approach will be an important reason teachers and learners choose this or another LMS. The first part of our paper addresses identifying and categorising the LMS used for teaching and learning foreign languages. Secondly, we give an overview of existing studies related to their environmental impact. We discuss the mainly positive environmental results. As the number of existing studies appears to be limited, an in-depth study regarding the use, the environmental impact, and the acceptance of LMS for teaching and learning foreign languages would be for the users and the developers an important step further.

Keywords:
foreign language, learning management systems (LMS), sustainability, software, competitiveness, learning, teaching

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M15, M53

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1 Introduction

Modern companies are placing much more importance on sustainability since their consumers are interested in brands devoted to protecting the environment. Smart businesses are taking new steps to attract these customers and new employees, and they need to comply with conducting an eco-friendly business model approach expectations (Mellon, 2022). Global competition forces organisations to continue to increase operational efficiency. This is done by cutting costs by reducing office space and limiting the mobility of employees by enabling online work from home. The Covid-19 pandemic has enhanced the changes in foreign language learning and teaching approach, pushing language learning processes from the physical world to the online world. Therefore, LMS for videoconferencing, among them Zoom, Webex, Microsoft Teams, Google Meet, etc., have become essential (Sternad Zabukovsek et al., 2022). They are important because of teachers' constant, interactive engagement with students, and they provide the right conditions for language improvement (Camilleri et al., 2022).

2 Theoretical Background

2.1 Language LMS categorised by functionalities

Learning management systems (LMS) are becoming more sophisticated and practical for learning and teaching foreign languages. They are classified into twelve categories: systems for managing learning content, communication, live or virtual learning, social network, blogs, presentations, sharing learning resources, creating a website, creating online tutorials, web search engines, dictionaries and utilities. The most popular content management systems (LMS/CMS) include Blackboard, Drupal, Joomla and Moodle.

The following are used to *conduct virtual meetings*: Zoom, Microsoft Teams, Illuminate, Livestream, and Google Meet (Son, 2011). Teams and Zoom services are visibly attributed (to the availability of features related to learning and to the design and usability). Zoom has some technical weaknesses, for audio-video is user-friendly. These platforms are similar, and they tend to borrow useful features from one another and are practical for online teaching with good quality functions (Kic-Drgas, et al., 2022).

LMS as *communication tools* include Gmail, Skype, Google Meet, Windows Live Messenger, and Yahoo Messenger. A good example is Skype which is still widely used for live chat and video conferencing. Zoom and Microsoft Teams are also powerful tools for video conferencing that combine real-time chat, content sharing and video. Each has its unique advantages. Regarding online classroom solutions, Zoom and Microsoft Teams have reached quite a high level, enabling automated live captioning and breakout rooms. Zoom's maximum event duration is 24 hours, which can support 500 participants, whereas Microsoft Teams' is limited, only 4 hours. However, both LMS are constantly changing and adapting to the needs of language learners (Son, 2011). All these video conferencing systems can be installed on a computer or mobile phone and run in web browsers (Correia et al., 2020).

As a great LMS for foreign languages, if appropriately and pedagogically adapted, are *social networks*, such as Facebook, My Space, LinkedIn and Twitter. Innovative pedagogy has also been successfully integrated into their teaching approach blogs and wikis. These tools can enable learner autonomy to develop at many language levels (A1-C2). In addition, they have a special potential for collaborative and situated learning, taking advantage of carefully designed instruction and considering students' backgrounds (Reinhardt, 2019). They are Blogger, Edmodo, LiveJournal, and WordPress.com.

Visualisation has become an important part of learning languages because it has been proven by prior research that it cuts down time and increases productivity by making data easier to understand for the learners, and it makes it easier for the teacher to interpret raw data (Brath et al., 2023). Visualisation presentation tools are Slides, Animoto and Slide Rocket. These offer innovative ways of presenting language materials. Resource sharing LMS is understood as one of the most valuable tools on the web. These include Google Docs/Drive, Dropbox, Voice Thread, Picasa, My Podcast, Slide Share and YouTube.

IT skills are also important in foreign language practice in formal and informal environments. Ningsih et al. (2022) state that smartphones, mobile phones and tablet computers, have emerged as the most common mobile technology for language learning practices. Some mobile applications include WhatsApp Messenger, Edmodo, Google Classrooms, online quizzes and web browsers and are a common practice in higher education institutions, used internally and externally in

EFL classrooms. Task-based learning and communicative language learning are the most effective common teaching approaches.

Moreover, *website builder sites* are another useful LMS. For example, Google Sites provides teachers and students with simple and easy ways to create foreign-language websites. Online content creation tools such as Content Generator, SMILE and ESL Video allow teachers to develop language exercises for students. Web search engines include Ask.com, Bing, Google and Yahoo Search. Nevertheless, the web is potentially helpful for language studies since it provides examples of contextualized and authentic language and is easily searchable, although uncontrolled, exhibiting different features from the written and spoken texts (Wu et al., 2009).

Also, *dictionaries* are language reference LMS, including Dictionary.com, Your Dictionary.com and Longman Dictionary of Contemporary English (LDOCE). And finally, valuable *aids* for language learning activities are: Calculate Me, Calendar Fly, Doodle, Currency Converter, Moviemaker, Google Earth, Lesson Writer, Story Bird, Mind Master, SurveyMonkey etc. (Son, 2011). *Digital storytelling* derives its power by weaving together images, music, narrative and voice, giving deep dimension and vivid colour to characters, situations, experiences, and insights because stories are now multimedia. These stories can include voice-overs, sound effects, music for your ears, and video and still images for your eyes, but the creative power comes from how the two are woven together (Rule, 2010).

Jackson et al. (2022) present features and integrated apps in MS Teams that help language learners develop their language skills. The integrated YouTube app allows a teacher to publish a link and will enable students to avoid diversion video viewing teams. Screen sharing feature helps a teacher to share a screen with students through which they can listen to audio recordings and watch the videos played. Group rooms are available to lead discussions and assignments. Video conferencing helps to conduct speaking activities and discussions among students. Flipgrid allows students to upload the recorded video so that teachers and other students can comment, so a speaking task is transformed compared to traditional classes. Ed puzzle helps the teacher combine videos and questions in the same application. Speech Coach is a feature that enables a teacher to give individual feedback privately on words, intonation, and repetitive language. Such type of feedback on human speech is impossible to obtain without technology. PDFs or DOC files for the student to read

specific content as e-books replace printed books. Glosses for Education offer teachers to create a reading group. Reading progress helps students get detailed feedback on their reading fluency, as on mispronunciations, repetitions and omissions. Chat is a feature that helps students to share their opinions and answers. Discussion forums help a teacher start a thread to discuss a topic with students, replacing oral discussion. OneNote allows teachers and students to write, draw, attach pictures and even voice and video recordings. It has some functional changes that can transform tasks as written assignments. Whiteboard can be used to write assignments with functional changes – colouring, highlighting, pinning notes, and writing.

Some universities have attempted to use freely available applications such as Zoom, Microsoft Teams, Google Meets, Facebook Messenger and Skype for teaching students. In addition, various social media such as YouTube, Twitter and Facebook have become popular among new learners. Facebook, as one of the most popular social networking sites, allows users to share and exchange profiles, photos and videos with others. Therefore, is a valuable tool for teaching various languages (Giri et al., 2022).

Teaching language subjects using LMS nevertheless has got limitations. The most obvious is the internet and data connection, followed by marking tasks and tests, plagiarism, poor interaction, and proper materials. Teaching language through LMS sometimes has a negative impact on the students and the learners' learning process, e.g., they can find their internet data expensive. There is a lack of proper sustainable professional training. It is challenging to decide on the most suitable materials and platforms. All in all, even though LMS can be used to communicate, the experience cannot be the same as live interaction (Son, 2011).

2.2 Theoretical background of acquiring languages online and sustainability of LMS

According to relevant literature study, the term sustainable development was initially concerned with the environmental aspect. It was stated that sustainable development incorporated two major concepts: the concept of "needs" and the concept of constraints imposed by the current state of technology and social structure on the ability of the environment to meet present and future requirements. It has become

a crucial transitional marker that has sparked an industrial explosion in the fields of development and sustainability. People have started to recognise that instead of focusing exclusively on the environmental sector, there is a need to see and sustain this globe as a whole unity. So, in 2015, the definition of sustainable development was expanded to include respect for all life, human and non-human, and natural resources, as well as incorporating issues like poverty reduction, gender equality, human rights, education for all, health, human security, and intercultural dialogue. In addition, sustainability tackles environmental concerns and the education system itself to develop a comprehensive and requisitely integrated system. Since UNESCO has recognised that education is essential to sustainable development, the idea of education for sustainable development (ESD) is then widely introduced to the global community as a tool to achieve sustainable development goals (SDGs). ESD is education that helps learners make knowledgeable decisions and take responsibility for environmental integrity, economic viability, and just society for present and future generations while valuing cultural diversity. It also commits to educating the next generation about global concerns and how to make a difference by themselves. It has been accepted that the principles of sustainable development ought to be taught through various disciplines and integrated into the available subjects only via a new special subject (Gayatri et al., 2023).

To ensure a sustainable teaching and learning environment in different contexts, teachers should use *class designs* considering distance learning, ensuring sufficient online or virtual space for interactive communication. This maintains class quality and develops a sustainable teaching and learning model that promotes students' help-seeking. Establishing opportunities to develop a sense of public responsibility is also better. Additionally, giving feedback on assignments should be considered the effectiveness of the timing. In an online class, interactive communication is limited to class hours. Preparing teaching materials for an online application is preferable even if classes are delivered face-to-face (Ashida et al., 2022).

According to Barolo (2019), video meetings are an important feature of acquiring language online, practically, through work experience. They may reduce the influence of a regular business meetings on the ecosystem. The CO_2 footprint is reduced by substituting only one online business meeting and not travelling by plane or other means of transport, thus reducing costs. Moreover, avoiding travel and having a video conference positively impacts the environment and significantly

reduces costs. That means e-learning of corporate foreign language is good for the planet and for business.

Furthermore, Hanna et al. (2022) state that we can indirectly improve language skills while we teach speaking, business, and computer skills. Because many before-mentioned LMS are used for video conferencing, and these applications are used on mobile and PC, the measurements have been performed, on phone and PC, and the environmental impact of LMS has been compared in terms of Carbon Footprint, across different user frameworks, as well as across these two platforms. The findings state that the top four LMS for foreign language learning with the lowest CO_2 impact is Google Meet, Microsoft Teams, Skype and Zoom (Derruder, 2021). Also, a global search volume study reveals that video conferencing has become environmentally highly beneficial and has taken an important position in global market shares (Digital Information World, 2023).

3 Methodology

The current study is observational and non-experimental, so the objective is to use the descriptive approach to the theory and concepts. Using the method of compilation, the positions of various authors regarding the selected research problem were summarised in the findings of LMS's impact on the environment. With the help of the comparative method, we compared similar phenomena of LMS for language learning and teaching and found similarities and differences between them. Using the method of analysis and synthesis, we logically connected the findings from practice and theory to each other according to the influence of LMS on the environment through qualitative methods, which include observations described in words and literature reviews that explore concepts and theories through competitiveness, environmental impact and in social responsibility in the continuation.

4 Results and Discussion

Learning and teaching foreign languages via LMS is essential in sustaining human relationships. It works as a signifier of social commitment to international collaboration. Hence, teachers should incorporate SDGs into their LMS-supported classes, so students can actively produce and use language for real-life problem-

solving. This paper has explored a conceptual study of LMS and its sustainable development integration. Through the integrated framework and feasible recommendations, it contributes to the theory that must provide practical implications for the sustainability of LMS language education practices by targeting public image, global competition, international communication, social responsibility, environmentally respectful businesses, and negative consequences of online teaching. Digital literacy and sustainability are, therefore, crucial for the sustainable development of education and business. Research is needed on how LMS for teaching languages are impacting sustainability. This study inventoried LMS for teaching languages and reviewed the few found articles on this kind of sustainability while also considering the possible negative impacts. Nevertheless, a further detailed study is needed to research this compelling domain.

5 Conclusion

This paper focused on the sustainability impact of language learning and teaching LMS. To identify the issues, we conducted a thorough review of the literature. The research results showed that environmental issues are important in the online foreign language acquisition field, which was emphasised during COVID-19. The authors of this paper have outlined some ideas that can be used as a theoretical background for further in-depth qualitative research to make LMS better and more environmentally friendly for foreign language teaching and learning.

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NEXUS AMONGST REMITTANCES AND INEQUALITY IN WESTERN BALKAN COUNTRIES: GLOBAL PANDEMIC CRISIS VS. FINANCIAL CRISIS

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Abstract This paper examines the impact of remittances on income inequality measured through Gini index, particularly, during the adverse external shocks, global financial crisis of 2008 and global pandemic crisis of Covid -19, in Western Balkan countries. Data highlight the fragile economic progress of these countries through fostering the income inequality during the long transition. However, migrants' remittances sustained to remain a significant source of foreign income in Western Balkan countries. The empirical results demonstrated a U-shape relationship between remittances and inequality related to Western Balkan countries, thus remittances have contributed on increased inequality. Meanwhile, the linear relationship amongst remittances and inequality demonstrated the negative impact of remittances towards inequality. Additionally, we found that remittances reduced significantly the inequality during pandemic crisis of Covid-19, serving as a shock absorber during adverse shock, but the remittances demonstrated the non – significant and positive impact on inequality during recent global financial crisis. We suggest that the policy makers should adopt regarding effective income distribution to reduce income inequality.

Keywords:
remittances, inequality, adverse global shocks, global financial crises, global pandemic crises

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1 Introduction

Globally, the remittances reached $689 billion during 2019 (World Bank, 2019) demonstrating the principal source of income related to numerous developing countries. Ratha and Plaza (2011) emphasized that the remittance flows incline to be steadier and more countercyclical flow compare to the capital flow. In addition, remittances confirmed to be more resilient during the financial crisis of 2008.

Blanchet et al. (2019) investigated the development of income inequality for 38 European countries during 1980 – 2017 through the harmonized methodology. He confirmed that inequalities enhanced at most of European countries both at the top and bottom of distribution, particularly among 1980 and 2000. His results highlighted the inequality's gap among Europe and USA, but it was lower and raised much less in Europe compare to the USA. Meanwhile it will be continued the significant income disparity among European countries and it was associated with fragile improvement of European-wide income redistribution.

Elouardighi and Somun-Kapetanovic (2009) analyzed the convergence process of income inequality amongst five Balkan countries during 1989-2008 through the comparison of the situation in the European Union of 27 countries. Their results demonstrated the real convergence process amongst Balkan countries. Meanwhile, the income and inequality convergence were higher during 2000s according to EU-27, but the greater part of convergence demonstrated during the second half of the 1990s according to Balkan countries. They highlighted the continuous and comprehensive development gap amongst Balkan and European Union countries.

This paper examines the relationship amongst income's inequality and remittances through comparative analysis among four Western Balkan countries (Albania, Kosovo, Montenegro, Serbia) during diverse shocks, particularly, financial crisis of 2008 and global pandemic crisis of Covid-19. The paper is organized into five sections. Second section presents related literature review on the link between remittances and income inequality. Third section give on overview on data and applied methodology. Then fourth section continues with empirical results and discussion referring to the panel regressions. The last section present some concluding remarks.

2 Literature Review

Diverse theoretical and empirical emphasized the significance of external and internal negative shocks related to their effects on the income inequality, particularly in developing countries.

Tokhirov (2021) examined the effect of international remittances on income inequality according to the post-communist region using the static and dynamic panel models related to 27 countries during 1991 – 2014. They found the U-shaped amongst the international remittances and income inequality referring to most of these countries. Meanwhile, they emphasized when remittances calculate more than 20% of GDP, they intensified the economic inequality.

Bajra (2021) examined the influence of remittances towards the economic growth and inequality within the Western Balkans. He found that the remittances have contributed to the income inequalities despite of converging to decline the share of remittances in a country's economy over the years. His empirical results related to the effect of remittances demonstrated no strong support towards the economic growth and inequality through testing the endogeneity of remittances.

Kóczán and Loyola (2018) investigated the remittances' effect according to the inequality in Mexico using the household-level data. They examined the remittances' effect during the 1994 Mexican Peso crisis and the Global Financial Crisis. They found that remittances can contribute to decrease the income inequality in the home country and to absorb shocks hitting the poorest.

Petreski and Jovanovic (2013) examined the impact of remittances on poverty and inequality in North Macedonia using two household surveys, particularly 2008 and 2012, after global financial crisis. They found the simultaneous effect of remittances to reduce the poverty and inequality before and after the crisis, meanwhile the inequality-reducing effect has demonstrated mainly in 2012, despite of increasing inequality during 2008.

Koechlin and León (2006) examined the inclusive empirical results related to the relationship amongst the international remittances and income inequality for 133 diverse countries during 1960 - 2003. They found a non-monotonic linkage amongst

them through simple cross-country regressions using ordinary least squares, instrumental variables and using dynamic panel data approach. They examined an inequality-increasing effect related to the remittances towards the income inequality, but they demonstrated the U curve shape amongst these variables referring to diverse stage of migration.

3 Data and Methodology

As we mentioned above our aim is to investigate the impact of international remittances on inequality 5 countries of Western Balkan region such as Albania, Kosovo, Montenegro, North Macedonia and Serbia during 2008-2020 period. Also, we have explored the effect of recent global financial crisis and pandemic crisis of COVID-19 according to the inequality. The main source of data refers to World Bank and Table 1 demonstrates the description of main variables and their statistics for all five Western Balkan countries during the period of 2008-2020.

Meanwhile, Table 2 demonstrates the dynamics according to the dependent and independent variables related to each country during 2008 until 2020. Data confirm the differences amongst countries in terms of their economic performances and development. Referring to the data, we observe that remittances account on average 10% of GDP for all countries in Western Balkan region, except North Macedonia. It proves the lowest percentage of remittances to GDP, less than 4.2%.

To explore the relationship amongst inequality and international remittances in Western Balkans we have followed the approach proposed by Koechlin and León (2006) and Tokrihov (2021). Both authors have considered the nonlinear link between remittances and inequality, thus we estimated the following regression referring to their approach:

$$logGini_{it} = \beta_0 + \beta_1 Rem_{it} + \beta_2 Rem_{it}^2 + \beta_3 logGDP\_cap_{it} + \beta_4 logGDP\_cap\_int_{it} + \beta_5 M3_{it} + +\beta_6 logDemocracy_{it} + \delta_1 dummy_1 + \delta_2 dummy_2 + \varepsilon_{it} \quad (1)$$

where the error component is $\varepsilon_{it} = \alpha_i + u_{it}$ and $u_{it} \sim iidN(0, \sigma^2)$, for each country, i=1,..,5 and t=1,2,…n.

Table 1: Description of main variables

Variable	Description	Mean	St. dev	Source
Gini index	The Gini index measures the extent to which the distribution of income or consumption among individuals or households within an economy deviates from a perfectly equal distribution. A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.	34.86	4.72	WB
Rem_GDP	Remittances as a percentage of GDP, where remittances comprise personal transfers and compensation of employees.	10.11	4.60	WB
Rem_GDP^2	Remittances as a percentage of GDP squared	123.25	99.87	WB
GDP growth	Annual percentage growth rate of real GDP.	2.20	3.63	WB
GDP per capita	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2015 U.S. dollars.	4846.33	1227.23	WB
M3 as % of GDP	M3 as % of GDP, where broad money is the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveler's checks; and other securities such as certificates of deposit and commercial paper.	55.92	14.32	WB
Democracy Index	Composite index measured as the sum of civil and political rights.	6.12	1.39	FIW

Source: Word Bank (2023), average of all countries.

Table 2: Stylized fact related to Western Balkan countries during 2008-2020

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	Gini index												
AL	30.00	30.00	30.00	30.00	29.00	29.00	34.60	32.80	33.70	33.10	30.10	30.80	30.80
KS	31.80	31.80	33.30	27.80	29.00	26.30	27.30	26.50	26.70	29.00	29.00	29.00	29.00
MN	41.20	41.20	41.20	41.20	41.20	39.00	38.80	39.00	38.50	36.90	36.80	36.80	36.80
NM	42.80	42.80	40.20	39.40	38.10	36.20	35.20	35.60	34.50	34.20	33.00	33.00	33.00
SB	39.90	39.90	39.90	39.90	39.90	39.50	40.50	40.50	38.80	36.20	35.00	34.50	34.50
	Remittances as % of GDP												
AL	14.48	14.26	13.30	12.04	11.52	10.03	10.74	11.34	11.01	10.08	9.62	9.56	9.69
KS	20.20	21.06	18.84	15.66	15.34	15.71	15.53	15.43	14.75	15.49	15.68	15.81	18.61
MN	6.56	7.29	10.04	11.21	12.42	12.21	11.83	11.58	10.99	10.77	10.69	10.54	12.59
NM	4.10	4.05	4.12	4.14	4.04	3.48	3.23	3.05	2.73	2.78	2.72	2.52	3.34
SB	6.79	10.30	9.85	8.04	8.19	8.32	7.85	8.50	7.88	8.13	8.78	8.23	7.25
	GDP per capita (constant 2015 US$)												
AL	3,298.48	3,432.17	3,577.11	3,678.05	3,736.34	3,780.70	3,855.76	3,952.80	4,090.37	4,249.80	4,431.54	4,543.39	4,410.46
KS	2,621.42	2,731.38	2,843.38	2,997.22	3,021.37	3,163.46	3,279.04	3,520.77	3,739.18	3,890.20	4,009.11	4,219.08	3,990.97
MN	6,205.79	5,833.63	5,982.17	6,168.82	5,995.75	6,202.48	6,306.99	6,517.16	6,707.82	7,023.40	7,381.77	7,684.15	6,515.51
NM	4,230.73	4,207.80	4,339.96	4,433.89	4,408.30	4,530.68	4,687.30	4,861.55	4,994.56	5,043.69	5,184.69	5,386.20	5,067.21
SB	5,270.96	5,147.57	5,206.09	5,354.20	5,343.58	5,524.97	5,462.74	5,588.98	5,805.90	5,959.52	6,261.53	6,567.91	6,552.09

Source: Word Bank (2023)

As explanatory variables we have included remittances, level of GDP per capita, and ratio of M3 as % of GDP as a measure of financial development and democracy index as a measure of political and civil right. We included two dummy variables in regression referring to recent global financial crisis and pandemic crisis of COVID-19 due to examine the impact of two core external shocks related to the inequality. The dummy variables take the value of 1 according to year 2008 and 2020 and zero value others.

4 Results and Discussion

We decided to exclude North Macedonia from the sample due to the lower percentage of remittances referring to GDP, approximately 3.4%. The estimated results related to the rest of Western Balkan countries are demonstrating in Table 3. We have presented the diverse specification based on panel least square regression. Estimated results confirm a U-shape relationship amongst inequality and remittances, therefore an increase of remittances beyond a threshold will significantly reduce income inequality measured through Gini index (column1). Meanwhile, we have included the economic performance indicator measured through real GDP per capital and level of GDP per capita at begin of 2008. Also, we have included financial development indicator measured through ratio of M3 to GDP. Estimated results (table 3, column 2&3) show a positive and significant results of initial GDP per capital on inequality, while we did not find a significant results according to the economic development. In addition, we found a positive impact of financial development on inequality, which it demonstrates that higher financial development of these countries has contributed on the deepening of inequality. However, we found a negative and significant impact of the democracy index on inequality, which show that improved political and civil rights contributed to the reduction of inequality. Otherwise, the estimated results according to the interaction amongst dummy crisis variables and remittances demonstrated that remittances have significantly reduced inequality and have served as a shock absorber during pandemic crisis of Covid-19 (table 3, column 4-6). Meanwhile, we did not find any significant results about the interaction term between remittances and financial crises dummy. These results display the divergence amongst two external shocks.

Table 3: Estimated results based on different specifications

	1	2	3	4	5	6	GMM
Rem_{it}	-0.084	-0.071	-0.059	-0.053	-0.065	-0.061	-0.132
	(0.004)	(0.003)	(0.000)	(0.002)	(0.000)	(0.001)	(0.048)
Rem_{it}^2	0.002	0.002	0.002	0.002	0.002	0.002	0.004
	(0.042)	(0.030)	(0.001)	(0.004)	(0.000)	(0.001)	(0.087)
$GDP\_cap\_int_{it}$		0.240	0.350	0.331	0.340	0.328	0.624
		(0.016)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP_cap_{it}		0.009	-0.145	-0.113	-0.098	-0.081	-0.450
		(0.946)	(0.123)	(0.253)	(0.298)	(0.405)	(0.018)
M_{3it}		0.002	0.005	0.004	0.005	0.005	0.009
		(0.204)	(0.000)	(0.001)	(0.000)	(0.000)	(0.004)
$Democracy\_index_{it}$				-0.369	-0.378	-0.368	-0.378
				(0.000)	(0.000)	(0.000)	(0.000)
Dummy_Fin_crises*Rem				0.002		0.001	
				(0.307)		(0.527)	
Dummy_Covid Rem					-0.005	-0.004	
					(0.058)	(0.090)	
Constant	4.182	1.970	2.774	2.610	2.458	2.381	
	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	
Obs.	52	52	52	52	52	52	44
Adj-R^2	0.427	0.700	0.866	0.866	0.873	0.872	P-Jstat (0.11)

Source: Authors' calculations by Eviews 7 (Note: Values in bracket present p-value)

To overcome the problem of endogeneity amongst our variables, we have presented the estimated results (column 7) based on GMM[1] approach. Whereas as instrumental variables we have used the lagged value of depend and independent variables. The estimated results demonstrate the nonlinearity effect of remittances on inequality. Thus, we confirm a U-shape relationship amongst inequality and remittances, so higher remittances above a threshold will significantly reduce income inequality measured through Gini index. Due to the impact of other control variables, we

[1] The dynamic models with panel data have two main assumptions: the error terms are uncorrelated and the dependent variables are completely exogenous. If the error terms are correlated, the estimates obtained may be inconsistent, for its elimination we use the Generalized Method of Moments (GMM) to evaluate the models, referring to Arellano and Bond (1991).

found that higher economic development and higher democracy index have contributed on the reduction of inequality. While higher financial development has contributed on deepening of inequality of these countries.

5 Conclusion

We have explored the nexus between income inequality measured through Gini index and international remittances within Western Balkan countries, except North Macedonia. We have investigated particularly the non-linear relationship amongst inequality and remittances through incorporation the interaction effects of remittances towards inequality during recent global financial crisis and pandemic crisis of Covid - 19. Empirical data on inequality of particular countries approve that their fragile economic progress has fostered the income inequality converging to the macroeconomic circumstances of them during 2008-2020. However, remittances have continued to be an important foreign income, an average at 10 % of GDP.

Estimated results based on OLS and GMM estimations confirm a U-shape relationship amongst inequality and remittances as ratio of GDP. These results highlight that remittances have significantly reduce inequality in Western Balkan countries. Our results show that economic development and democracy have negatively affected inequality. Also, additional enhancement of economic performance and political and civil rights reduced inequality in Albania, Kosovo, Bosnia-Herzegovina and Serbia. While we found that financial development demonstrates an opposite effect, through increasing inequality. Results demonstrate that remittances have contributed on reducing inequality and might have served as an absorber mostly for vulnerable households, particularly during the pandemic crisis of Covid-19. Referring to these results we suggest that the policy makers should enact the appropriate policies related to the effective income distribution in order to reduce income inequality during the external shocks. Due to this crucial consequence, the income redistribution policies should be monitored in the future within Western Balkan countries.

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DIGITAL TRANSFORMATION IN HEALTHCARE: AN ANALYSIS OF TELEMEDICINE AND PUBLIC POLICY

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Abstract Technology advancements and the rising need for more accessible, effective treatments drive a digital change in the healthcare sector. Adopting telemedicine enables remote consultations and treatments as essential elements of transition. The paper examines opportunities and challenges that telemedicine currently brings in healthcare ascertaining how public policy may encourage the use of telemedicine and best practices adoption to ensure efficacy, starting with a literature review on telemedicine status quo-definition, services provided, their advantages and disadvantages. The telemedicine current practices within healthcare industry are examined considering adoption rates, obstacles' use and economic effects. The paper also concentrates on the public policy role encouraging the telemedicine use, the legal and regulatory frameworks controlling it, policies and incentives promoting it too. The final of the paper outlines the best ways to deploy telemedicine, the use of technology for electronic health records, remote monitoring tools together with patients' participation and their education's significance. Overall, the paper grants a thorough examination of both opportunities and difficulties that telemedicine currently presents for healthcare, the role of public policy in promoting its adoption, and the implementation of best practices to ensure its effective use.

Keywords:
telemedicine, healthcare, digital transformation, public policy, best practice

JEL:
I00, L38, D80, L86

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1 Introduction

The COVID-19 pandemic imposed unprecedented pressure on healthcare realm, worldwide, causing saturated systems, logistical non-conformities, medical staff shortages, inadequate public management and ineffective crisis-related public policies (Pfefferbaum & North, 2020). This situation has revealed vulnerabilities in the public systems and called for innovative transformations to build resilience and promote better management of future crises. While further research is needed, this paper argues that smarter design of public policies can support the development of resilient human resources backed by technological adoption.

The impact of the recent pandemic has been far-reaching, affecting entire society besides the health sector. According to WEF's Global Risks Report 2021 (Schwab & Zahidi, 2021), perturbations generated the cancellation of important international events and significant economic losses in most industries. In response to the overwhelming demand for healthcare services, the sector has been forced to mobilize and innovate beyond its traditional boundaries, leveraging existing resources to save lives and mitigate economic losses. To better manage future crises, public policies should focus on building resilient human resources through the incorporation of technological advancements.

The COVID-19 pandemic has placed a significant strain on healthcare systems globally, leading to high alerts and full resource utilisation for emergency responses. The coordination and effective functioning of health systems have become critical international concerns to address the demand for medical services. This atypical crisis has required swift changes in various areas, including operation patterns, service prioritisation and care delivery, to combat the pandemic and restrain its consequences. With healthcare administration and patients gained experience in managing COVID-19, the focus still remains on reducing the pandemic devastating effects and providing higher quality to all services.

2 Literature Review

Telemedicine (TM) refers to the remote delivery of healthcare services (Sood *et al,* 2007) using telecommunication and digital technologies (Tedros, 2020). Over the years, TM use has increased being effective in providing remote care to patients with

chronic conditions, enabling access to specialised care and reducing the burden on healthcare facilities (Martinez et al., 2006) and the pandemic accelerated its adoption and integration into healthcare systems (Mihoreanu et al., 2022). Moreover, TM has the potential to improve health outcomes and patient satisfaction while reducing healthcare costs (Khan et al., 2021), expanding access to services and promoting care continuity.

The adoption of TM addressed some of the challenges faced by healthcare systems during the COVID-19 pandemic when it helped maintain social distancing, reduced the risk of infection, provided care to patients in quarantine or self-isolation (Gordon & Catalini, 2018), supported the management of the surge of patients seeking care.

The last pandemic has highlighted pre-existing weaknesses in the healthcare systems: repetitive routine, bureaucratic administration, ineffective workflows, lack of standardisation and deficient process optimisation. TM is included in telehealth (TH) but differs from it: it represents a broader application of technologies to support health services, a challenging solution with potential to standardise and automate tasks, referring to the remote exchange of medical information and/or services between patients and clinicians via electronic technology, a new coming complementary structure in the practice of medicine. Conceptually, TM relies on medical doctors rather than other healthcare professionals and is intended to: provide clinical support, improve health outcomes by overcoming geographical barriers, and use medical support instruments with patients to operationalise ICT (Hoffman, 2020). Tedros (2020) considers the TM purpose, mission and medical support as essentials instruments which only complements the classical medicine allowing for the provision of remote clinical services in critical situations where patients are isolated due to illness or physical/geographical unavailability (Tanțău et al., 2014). It can help reducing the spread of infection and prevent unnecessary visits to overcrowded or in crisis health facilities.

Despite the success of TM practice in other countries, its implementation in Romania has been limited: teleconsultations were used at 30% in the first pandemic year, less than the European mean of 39% due to various obstacles - methodological, financial, praxeological, regulatory issues together with concerns over liability for malpractice, issues related to reimbursement of medical service providers,

technological challenges, patient access to technology and training in using devices (Argyres et al., 2022). With a new regulatory framework as a unique opportunity to promote the use of TM services, the Romanian health authorities continue the efforts to facilitate the implementation of e-healthcare.

3 Analysis of the Digital Transformation in Healthcare

The adoption of technology has improved patient outcomes, increased efficiency and care quality. Digital transformation changes the societal fundaments, including the healthcare sector: facilitating adoption of electronic health records (EHRs), enabling providers to access patient data remotely, sharing information across different facilities, improving patient safety, reducing medical errors, and streamlining healthcare processes. Increased collaboration will improve care coordination and reduce medical errors. Furthermore, TH emerged as a critical component of digital transformation in healthcare, enabled remote consultations, telemonitoring and TM (Bashshur et al., 2016). Innovation for medical devices, wearable sensors, has spurred allowing to monitor continuously patients' current health parameters, facilitating early detection of health problems (see Figure 1).

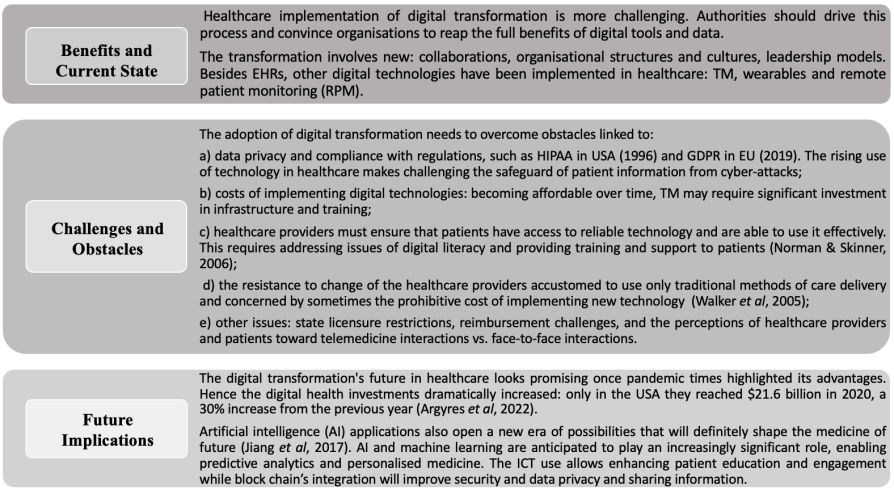

Figure 1: Theoretical aspects box

Source: Authors' elaboration adapted after Norman and Skinner (2006), Walker et al. (2005); Argyres et al. (2022) & Jiang et al. (2017)

RPM is combining digitally transmitted health-related data to improve patient care. Although it dates from the 90s, this concept was revived with COVID-19 pandemic, in order to treat chronic conditions (cardiovascular disease, diabetes, obesity, cancer care, speech language pathology, mental health, paediatric conditions *etc*). High cholesterol, hypertension, weight management, insulin resistance, receiving chemotherapy- liked issues were addressed to improve health-related outcomes and reduce unnecessary health care costs. A systematic review on RPM (Farias FAC, 2020) shows increasing publications number between 2015-2018 (43%), with Wireless devices or smartphone apps being the most popular strategy (75.7%), with 17.6% of studies employing tele-education and 24.6% employing teleconsultation measures. Romania still has the opportunity to set up an e-Health system strategy development and optimise both data flow and actors' interaction, using a single electronic health records system across health system with EU funding.

4 Methodology

Methodological aspects box is outlined in Figure 2.

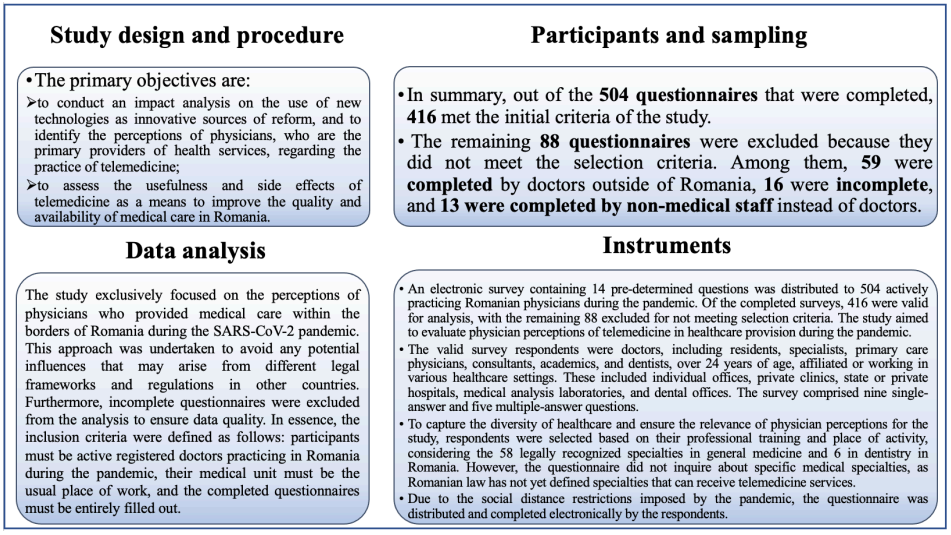

Figure 2: Methodological aspects box
Source: Authors' elaboration.

The current methodology comprises a four-stage investigation, delineated as follows: firstly, to ascertain the current state of knowledge pertaining to the medical care dispensed through telemedicine and the prevailing conceptual framework in the global and national domains of telemedicine during the pandemic; secondly, to design and administer a questionnaire to gather the opinions of physicians with respect to the use of telemedicine as a modality for healthcare delivery; thirdly, to analyze the accumulated data; and fourthly, to delineate the advantageous facets of the utility of telemedicine and its pragmatic constraints.

5 Results and Discussion

To draw better the TM significance, a survey has been applied between 01.02.2021–01.03.2022, for active healthcare professionals in Romania: aged 24 and above, affiliated to different various healthcare facilities - solo practice, private clinics, public and private hospitals, medical laboratories, and dental offices. Of all respondents, 89.9% were female. All age categories were present: 31-40 years (33.7%), 41-50 years (28.8%), 51-60 years (19.5%), 24-30 years (11.8%), and over 60 years (6.2%). Consultants/academics (46.9%) proved the most prevalent, specialist doctors (34.5%), residents (13.8%), and dentists (4.8%). Over 75% of respondents primarily provided in-person medical care. 90% of them declared they used modern ICT tools to improve patient communication. 90.6% of doctors relied mainly on phone communication, while 80.3% used mobile chat applications, text messages (59.6%), emails (52.4%), video calls (25.5%), or other methods (6%) (Figure 3).

With respect to TH services, 73.3% of doctors reported individual consultations and appointments as the primary mode of communication with patients; mail, couriers and messenger followed (28.6%). 8.2% used a dedicated TH platform – for patients. 3.8% of respondents preferred the groups' discussions (Figure 4).

Concerning the provision of telehealth services, a significant majority of physicians (73.3% or 305 respondents) indicated that patient communication and interaction occurred through pre-scheduled individual consultations or appointments. The use of mail, courier services, and messenger accounted for 28.6% of responses. Notably, a mere 8.2% (34 physicians) employed a dedicated platform designed for this specific purpose, namely a patient portal. Discussion groups constituted a further 3.8% of responses (see Figure 4).

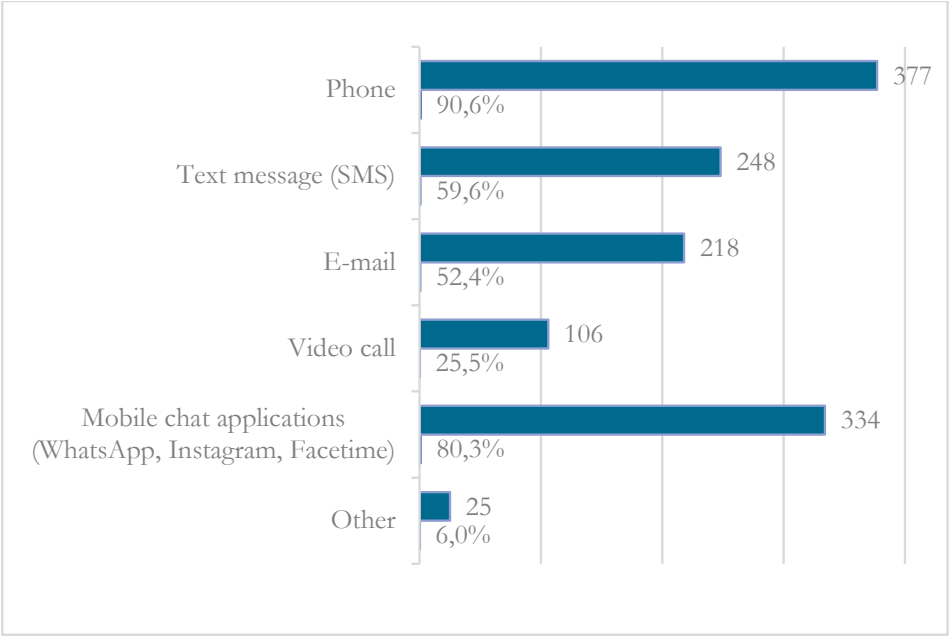

Figure 3: Distribution of electronic means of communication used in providing healthcare.
Source: Mihoreanu et al. (2022).

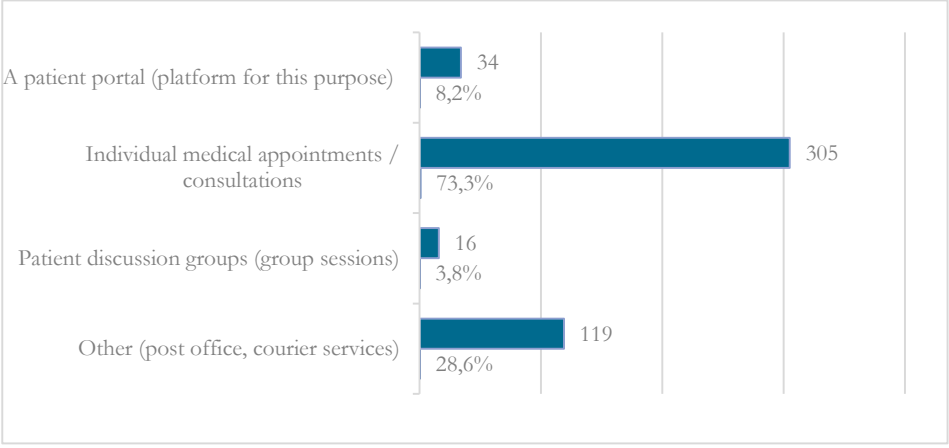

Figure 4: Distribution of electronic communication methods used for providing medical assistance.
Source: Mihoreanu et al. (2022).

The majority of research participants identified the following benefits of providing medical services via telemedicine: • direct contact with the non-displaced/ difficult to move or isolated patient at home (75.7% or 315 doctors); • medical assistance for patients from hard-to-reach geographical areas (71.4% or 297 doctors); • quick and valuable access to specialists and to all information necessary for the optimal development of the medical act and the indicated therapy (66.6% or 277 doctors); • real-time monitoring of the patient's health evolution (63.7% or 265 physicians), as shown in Figure 5.

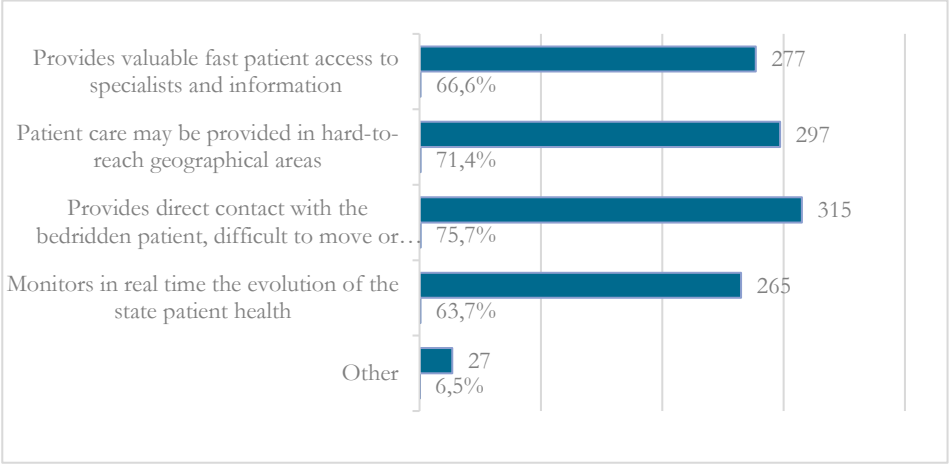

Figure 5: Benefits' distribution of providing medical services through TM
Source: Mihoreanu et al. *(2022).*

The assessment of the utility of telemedicine in healthcare provision was undertaken from the perspective of physicians, who serve as the essential providers of healthcare within the system. In the realm of healthcare, medical professionals assume the responsibility of evaluating and determining the usefulness of delivering specific health services, whereas competent authorities assess the standards of healthcare quality in relation to patients' needs, rather than relying on patient self-assessment. Patients' satisfaction with received healthcare services comprises an element grounded in their assessment of non-medical factors, such as communication, information, and their relationships with medical unit staff.

The extent of the need for medical services during the pandemic and the recognition of the assistance provided by telemedicine are evidenced by data obtained from a solitary academic institution, which recorded an escalation in the number of medical services delivered from less than 100 consultations per day to over 2200 consultations per day during a monitoring duration exceeding 24 days. Telephonic and video calls were the most prevalent modalities of communication employed. Telemedicine (TM) offers several advantages, including cost-effectiveness, increased accessibility to health services for diverse categories of beneficiaries, and the potential to alleviate the persistent public health problem of health professional shortages.

6 Conclusion

TM is an essential component of a resilient reform: improves accessibility and quality, addresses new challenges for healthcare system beyond pandemic and provides benefits for all actors involved. Some challenges are still to overcome: ensure data security and privacy, provide adequate support and training to patients and staffs, driving further innovation and health improvement.

The future of digital transformation is promising with increased investment and interest in artificial intelligence and its tools. As healthcare continues to evolve, digital transformation will better define its role in integrating: the healthcare education of both patients and professionals, better access to all services, a higher quality of care and ensuring treatment continuity at all times.

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WOMEN PARTICIPATION IN THE LABOR FORCE: THE CASE OF ALBANIA

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Abstract Despite the increase in the labour force of women and the focus given of gender equality, women still do not have the same opportunity as men to participate in economic activity. Yet, after 7 years where 193 countries pledged to achieve SDG goals, including gender equality goal, there are still 20 percent less women than men participating in the work force on average globally, and there are major disparities between genders in pay and educational opportunities. These disparities are particularly high in developing countries such as Albania, where even though statistics on women's employment have improved recently, they still fall short of the average for EU nations. The findings suggest that the most important factors determining the labor force participation of women are social norms, social support, and education. In this aspect, the economy of Albania has much potential to further increase economic development by empowering women. The aim of this paper is to assess the extent of gender inequality and estimate the determinants of labor force participation of women, as it is fundamental for policymakers in developing successful and sustainable fiscal policies that tackle down these differences. An important limitation of this paper is the insufficiency of gender-disaggregated data.

Keywords:
equal opportunity, SDGs, labour market participation, female participation, gender inequality

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1 Introduction

One of the most important issues currently facing the job markets is gender inequalities. Women are significantly less likely than males to engage in the labor force globally, and once they do, they are also less likely to find employment than men. Their access to quality employment opportunities remains restricted especially in developing countries such as Albania. Historically, women have faced significant barriers to full participation in the labor force due to societal and cultural norms that have perpetuated gender-based stereotypes and discrimination. The importance of women participation in labor force lies in the fact that it can benefit both individuals and society as a whole in a variety of ways, according to United Nation, which included the gender equality goal in the sustainable development goals to be reached within the year 2030. Women who work, typically enjoy higher degrees of economic independence, better health, and more social and political influence. Also, increasing the number of women in the labor force can promote economic growth and lower poverty (United Nations, 2015).

Women's participation in the labor force has been driven by a range of factors, including changes in societal attitudes towards women and work, increased access to education and training, and government policies aimed at promoting gender equality. However, despite the progress, women still face significant challenges in the labor force, including lower pay and fewer opportunities for advancement. There is still a significant gender pay gap, and women continue to be underrepresented in leadership positions across industries. To address these challenges, there is a need for continued efforts to assess and address gender equality in the labor force and to support women in their human capital accumulation.

2 Theoretical Background

The participation of women in the labor force has been a topic of interest for many researchers and policymakers. Over the years, there have been various studies conducted to analyze the factors that influence women's participation in the labor force. According to the World Bank, 2022 the global labor force participation rate for women has maintained a steady pattern over the last three decades reaching 46.2% in 2021, compared to 71.7% for men.

According to Blau and Kahn (2017), the gender wage gap has decreased in most countries, and women's labor force participation rates have increased. However, there are significant variations in women's labor force participation rates across regions and countries. In general, women's participation in the labor force tends to be lower in developing countries compared to developed countries. Within countries, women's participation rates vary by age, education level, marital status, and other factors. Numerous studies have identified various factors that influence women's participation in the labor force (Sachs et al., 2022).

Kabeer (2017) notes that education is a key factor that influences women's participation in the labor force. More educated women are more likely to work and participate in the labor force and hold occupations with better salaries. Women's engagement in the job force can be significantly impacted also by family obligations. According to (Henau et al., 2019) women who are responsible for caring for children or older family members may have more difficulties when trying to enter the workforce, particularly if they lack access to affordable eldercare or childcare. These findings are in accordance with the report of International Labor Organization (Matthew et al., 2016).

Strong social norms may exist in some countries that discourage women from working outside the home, especially in professions where men predominate (OECD, 2020). Women's engagement in the work force may also be impacted by legal considerations and social policies. Women's participation in the labor sector can be encouraged by laws and policies that uphold women's rights and offer equal opportunity to men and women such as offering gender-responsive fiscal policies (ILO, 2021). The literature review for the case of Albania supports all the above findings and suggests that the factors that affect women participation in labor market are education, marital status, patriarchal society, and government policies in form of social support (Miluka & Tsushima, 2017; Ekonomi et al., 2019).

3 Methodology

National statistics from public national institutions and national and international reports on gender equality were some of the key documents that this research study consulted in conducting its analyses. To explore the many elements of gender discrepancy, the study is based on a mixed method approach which combines qualitative and quantitative methodologies. The paper reviews the most recent

international and micro national literature on this subject in order to be able to undertake an in-depth study of the factors that contribute to the women participation in labor force in Albania. Statistics on labor market were drawn from the annual Labor Force Survey conducted from Institution of Statistics of Albania (INSTAT, 2022) which uses the same methodology to estimate the indicators (labor force participation rate, employment, etc.) as Eurostat.

4 Results

The data on working-age population and the labor force participation rate in Albania, for the last fifteen years, are presented in Figure 1. The chart provides information on the progress over time of the components of the working-age population, composed from the labor force (employed and unemployed) and the economically inactive population, which includes all economically disengaged individuals in society. During the last 15 years, the working-age population has included about 2/3 of the entire population of the country. 63.6% of the working-age population - about 1.3 million individuals - are included in the labor force, while the remaining part is the economically inactive population.

Although apparently the number of women in the working age of 15+ years is greater than men, the labor force participation rate by gender shows that women participate less than men in the labor market. As shown in the graph, these differences are important and persistent over time. During the last 8 years, the gap between the rate of participation in the labor force between men and women has decreased, without going below 15%.

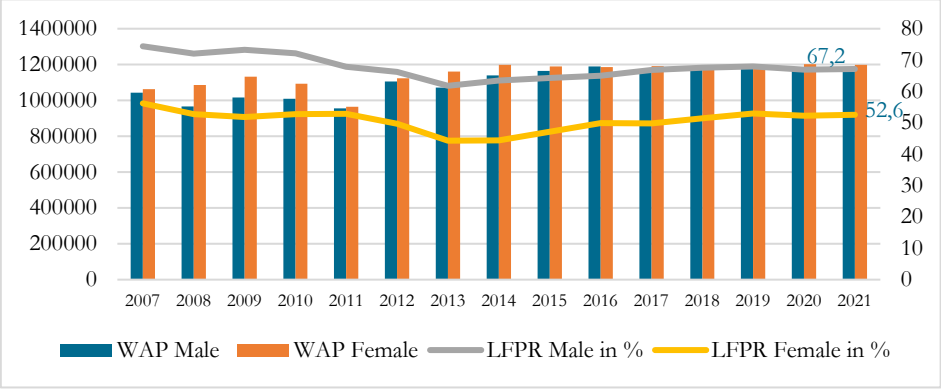

Figure 1: Working Age Population (WAP) and labor force participation rate (LFPR)
Source: INSTAT (2008-2022).

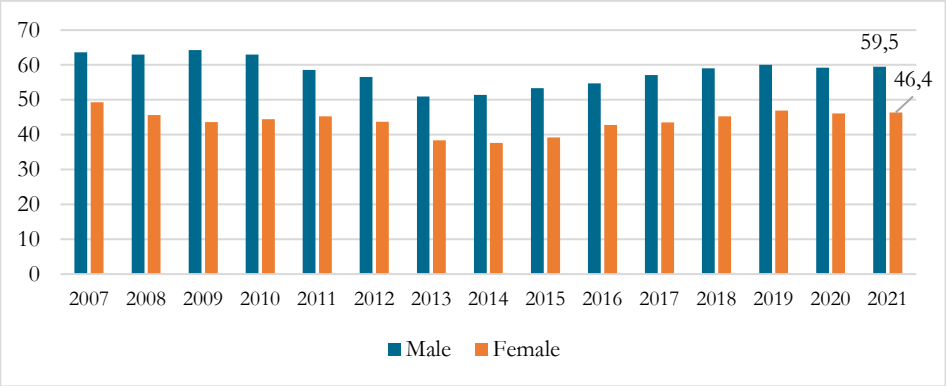

Figure 2: Employment rate by gender, age 15+ (%)
Source: INSTAT (2008-2022).

While the data in Figure 2 show that in Albania during the last 15 years, the gap between men and women in the proportion of employees remains relatively constant in 14.4 percentage points with about 153 thousand more men on average.

There is a harmonized dynamic between economic growth trends and rates of employment. In the short term, it seems that economic growth precedes the decline in the rate of employment. The sudden drop in the labor force participation and the level of employment in 2013-2015 reflects the slowdown economic of the country in the period 2011-2014 (because it happens exactly two years after the period), during which economic growth recorded the lowest values of these 15 years, with an average of 1.3%. During the recession, it is important to note that, female individuals are affected more than their male counterparts. For the year 2012, the rate of employment for male fell by 9%, while as that of female fell by 12%. This pattern is repeated in 2020, where as a result of the economic decline from the Covid Pandemic, the employment rate of men decreased only by 13% while that of women by 17%, showing once again their vulnerability.

Women compound the largest weight of the economically inactive population: almost only half (52.6%) of the total number of Albanian women of working age 15+ is included in the workforce of work. Meanwhile, for men of working age 15+, inclusion in the labor force is about 67.2%. These figures highlight the tendency of Albanian women to avoid long periods of being unemployed and looking for it, remaining in economic inactivity in the absence of secure employment.

The structure of the population outside labor market as shown in Figure 3 is dominated by pupils/students (33.3%) but only 28.1% of inactive female aged 15-64 follow secondary/tertiary education in comparison to 42.2% of male individuals. Along with the statistics of 30.3% of female fulfilling their domestic tasks (family care, etc.) compared to just 0.9% male, this graph shows where the priorities of female individual lie and the reason of the low participation rate in labor force. Social norms, social support, and education are among the most important factors determining the labor force participation of women.

One of the major obstacles to developing gender equality in Albania are society's conservative gender norms that make men and women to think differently about traditional gender roles. Women's rights and gender non-discrimination legislation and policies are not well known, and this includes many people and women themselves.

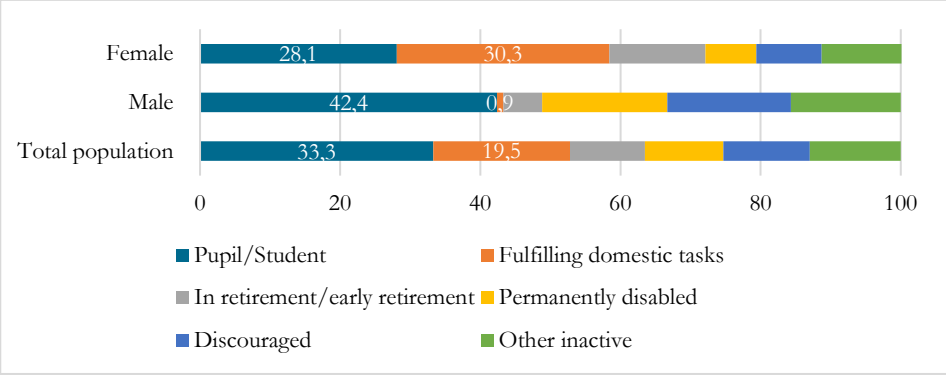

Figure 3: Structure of the economically inactive population aged 15-64 years old by sex, 2021
Source: INSTAT (2008-2022).

Inside the household, gender duties are clearly segregated. According to one in three women polled in 2021, women should focus on domestic duties while men should pay attention to their jobs and leadership opportunity (Observatory for Youth and Children Rights, 2021). More than 80% of Albanian respondents to the country's one and only Time Use Survey in 2011 stated that is normal for women to typically do the laundry, iron clothes, clean the house, prepare meals, and wash dishes (Albania Time Use Survey, 2010-2011), The number of hours spent on housework was correlated with gender and personal-level income. Education had an important

impact on public perception. More educated respondents were less likely to mention a traditional gender-based division of labor within the home. Furthermore, household duties were reported to be completed in fewer hours by respondents with at least a tertiary degree compared to those with only a secondary diploma. In addition, women become inactive due to unmet childcare needs.

In Albania, there is no social support for children apart from relatively expansive and problematic public nursery for children. As a result, having more children makes it more expensive for women to remain in the workforce, necessitating the need for social help from the government for mothers with children in need of care, notably in the form of accessible, inexpensive child care or on-site/work child care. Fewer than 40% of respondents said they receive no childcare assistance or support. The most usual child support reported from 1 in 4 responders was support from their parents or their partner parents. Only 1% of the responders were able to afford babysitters. This explain in part the decision of female to not participate in labor market and to be inactive by fulfilling their domestic tasks providing approximately four times more unpaid care as male do in raising their children (UNDP, 2016).

As shown in Figure 4 and 5, education explain the differences that exist in labor force participation rate for the year 2021 but the pattern is consistent throughout the last 15 years even though it fails to explain in length the differences in wage. The labor force participation rate of female with tertiary education aged 15+ is 74.2% compared to 78.3% of their male counterparts resulting in a trivial gap of only 4%. While as for male and female this gap is significantly great at 24.4% in favour of male individuals compared to the total gap 15%. Occupational stereotypes limit women's and girls' choices in education and job places because they work primarily in industries with lower earnings, such as manufacturing, agriculture, health and social services, all sectors characterised by lower wages. In the formal sector, men are paid 4.5% more than women in 2021, a significant decrease from previous high values of 10.7%.

Women in Albania continue to work primarily in agriculture (40% against 28.8% of men) and Public Administration, Community, Social and other Services and Activities (22.9% against 13.6% of men). On the other hand, men are concentrated in Trade, Transportation, Accommodation and Food, and Business and Administrative Services (30.3% against 20.3% of women) (INSTAT, 2022).

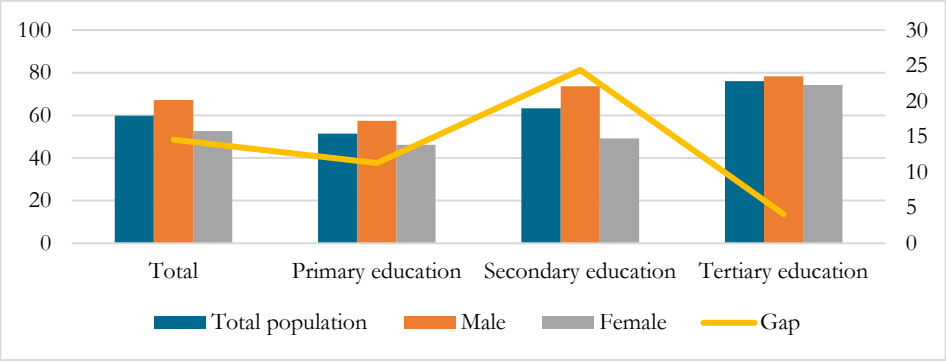

Figure 4: Labor force participation rate by education, age and sex, 2021 (%)
Source: INSTAT (2008-2022).

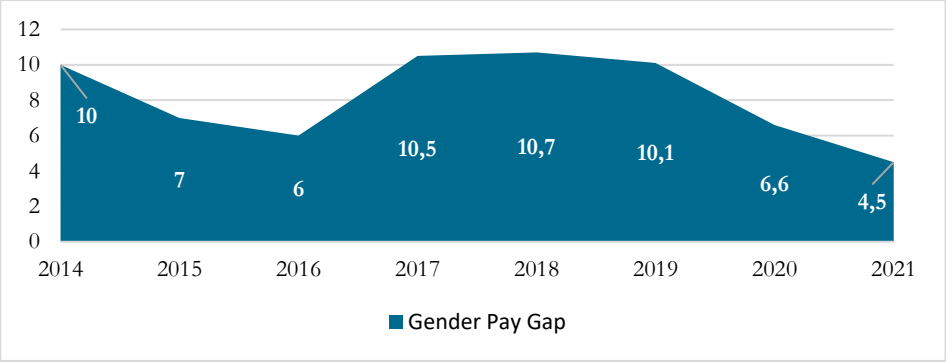

Figure 5: Gender Pay Gap (%), 2014-2021
Source: INSTAT (2008-2022).

5 Discussion and Conclusion

Women remain underrepresented in the labor market in Albania. In 2021, 52.6% of women were present in labor force, whereas men's presence stood at 67.2%. In other words, there is still a gender participation gap in the labor market of 14.6 p.p., which has only slightly decreased in the last 15 years. Women are increasingly well qualified: more women than males graduate from universities. But women don't feel as free to choose their educational path and career opportunities and don't have the same job prospects as men because of inexistent social support for childcare and society social norms which segregate household duties by gender. The latter is also the main reason for the inactivity of female aged 15+ years with 30.3%. Education

affects not only the perception of the figure of female as housewife and the participation rate in labor force but even the gender gap in participation in labor force which decreases with the increase in years of education obtained. Education tries to explain also the differences in gender pay as women choose stereotype occupation such as manufacturing, agriculture, health and social services, all sectors characterised by lower wages.

The paper suggests that in order to improve economic justice and to achieve gender equality in Albanian labor market several fiscal policy measures should be taken to tackle gender inequalities. Women's leadership should be strengthened to reduce labor market segregation and to give women more negotiating power in the home when it comes to financial decisions in order to promote decent employment and equitable payments. Gender equality and non-discrimination should be promoted, while putting a high priority on affordable and inclusive education with greater focus on education fields that brings higher value added. It is also requisite to develop gender-responsive fiscal policy that aim to lighten the burden of childcare.

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Consumption and Production Relationship with the Environment: An In-depth Analysis for the Albanian Economy

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Abstract With the world population increasement rates and the greedy nature of humans, the levels of production and consumption will be continuing to increase globally. We should be aware that the quality of life of one individual depends on the degree to which the planet is protected and utilized. Production activities and, albeit indirectly, consumption processes are directly linked to the scarcity of natural resources and environmental impacts. In fact, it is consumption, final or intermediate, the fundamental causal factor and driver of change in production activities, making the focus of EU environmental policies on sustainable consumption and production to evolve from a cleaner production through sustainable products to a more holistic approach to sustainable consumption and production. This paper aims to study theoretical and practical aspects of the relation between consumption and production and environmental pollution while taking in consideration one of the main sustainable development goals that urge to reduce our ecological footprint by changing the way we produce and consume goods and natural resources. For the case of Albania, the analyse suggests a positive relationship between the quantity and the type of what is produced and consumed, and the types of waste generated, despite limitation in data imported.

Keywords:
consumption, production, waste, environment, sustainable development

JEL:
E21, E23, Q53

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1 Introduction

As stated in the United Nations Report (2022), unsustainable patterns of consumption and production are root causes of the triple planetary crises of climate change, biodiversity loss and pollution. The same report indicates that our reliance on natural resources is increasing, rising over 65% globally from 2000 to 2019, meaning that the total amount of materials directly used by an economy to meet the demands for goods and services from within and outside a country reached the value of 95.1 billion metric tons globally.

The main driver for this seems to be the growth of population and consumption. The world population is increasing fast, that said based on the number of years in decline that the world population needs to increase by one million. To make it worse, the level of consumption (measured in constant 2015 US$), for the exact same periods of time, has been increasing even faster. As for Albania, the level of GDP/capita and of consumption/capita measured in constant currency, have been rising year after year, meaning that the levels of production and consumption per capita have done the same (World Bank Data, 2023).

In less than two decades starting from 2000, total domestic material consumption (DMC) rose by more than 65% globally, amounting to 95.1 billion metric tons in 2019 as reported by United Nations (2022). Paradoxically to SDG No. 2 to end hunger, huge amounts of food go lost or wasted. Only in 2020, 13.3% of the world's food was lost after harvesting and before reaching retail markets and 17% of total food available to consumers is wasted at household, food service and retail levels. Food that ends up in landfills generates 8-10% of global greenhouse gas emissions, worsening the environmental footprint of food production and consumption. In Albania specifically, according to a survey by Preka et al., (2020), food waste is prevalent with most wasted foods to be bakery and dairy products. For the case of Albania, as stated in the Sustainable Development Report 2022 by Sachs et al. (2022), SDG No. 12 still remains a change for Albania, but it is on track.

2 Theoretical Background

European Environment Agency (2010) cites that the consumption of goods and services in developed countries is a major driver of global resource use and associated environmental impacts, whereas production activities across economic sectors are directly responsible for the majority of the environmental impacts caused by the economy.

Natural resource use, indicated by DMC, has high environmental relevance as an indicator of potential environmental pressure on a domestic territory. These materials used on the input side are either emitted back to the environment as waste and emissions or contribute to the increase of the national physical stock with potential flows of waste and emissions in the future according to United Nations Environment Programme (2021).

Turener (2011) in his analyse for the Australian economy highlights the significant and detrimental impacts of consumption on the environment. His modelling shows that the practice of buying ever more 'things' and discarding them is undermining natural resources to such an extent that an economic and societal collapse is likely if substantial changes are not made. In order to reach a sustainable economic system when considering consumpttion, it is required a stabilised or lower population, reduced household consumption along with shorter working weeks, large material and energy efficiency improvements, and investment in 'green' infrastructure.

As production and consumption processes are often proven to be related with the environmental degration, EU has evolved its policies from a focus mainly on cleaner production, through sustainable products to a more holistic approach to sustainable consumption and production (European Commission, 2019). The Circular Economy Package was introduced in 2015 and it is focused on minimization of waste generation, considering that natural resources are depleting at a fast pace with the world population increasing rapidly.

Kolesnik and Merkulina (2021) in their analysis of the Russian economy conclude that the main vector of functioning of the domestic waste management industry should be aimed at reducing the negative impact of production and consumption waste on the environment, including on humans, which requires the introduction of

environmental management systems and standards at enterprises operating in this industry, based on the concept of a closed-loop economy.

According to European Environment Agency (2021), the National strategy on integrated solid waste management 2020-2035 of Albania, prioritises three main waste types: construction and demolition waste, packaging, and electrical and electronic ecquipments. Waste management is one of Albania's biggest environmental challenges (Totoni et al., 2021) and its practices are still dominated by a linear collect-and-dispose approach according to GIZ (2021).

3 Methodology

The methodology used to analyse the relationship between production, consumption, and waste in Albania is based on quantitative indicators and the data used are at the macroeconomic level. Annual data are collected from INSTAT, where for the DMC and waste, data are collected for the 2010-2020 and 2013-2021 time periods, respectively, depending on their availability. In Albania, data on waste have started being collected since 2013, making it relatively difficult to analyse their relationship with other variables for extended periods.

Here, DMC is a territorial (production side) indicator, which reports the amount of materials that are used in a national economy, taking in account domestic extractions and the physical trade balance of these natural resources. DMC describes the physical dimension of economic processes and interactions and can also be interpreted as long-term waste equivalent. The analyse is made for DMC/capita level and its components (calculated as percentage to the total by the author), as it is considered as an environmental pressure indicator referring to United Nations Environment Programme (2021).

As for the waste, total generated waste constitutes the theoretical total amount of waste generated by human activity in the respective year. This indicator refers to the waste managed in areas where this activity is carried out as a public service to the community and the quantity of waste managed by the residents because waste treatment is not provided by public services. The analyse is made based on data on managed (typical family and industrial) and unmanaged waste in nominal values to

show their trend over time, where for managed waste, the analyse is made using weighs of the categories compounding it and of treatment waste methods.

4 Results

Regarding the use of natural resources, Albania supports its production mainly on two typical categories: biomass and non metalic minerals. For all the period examined, the weight of non metalic is higher than that of biomass, except for the last year where values reach 41.8% and 43.7% respectively. Other materials that are consumed domestically in Albania are fossil energy materials/carriers, which have shown a decreasing trend on the last years and the metal ores (gross ores), which have had an increasing trend, both reaching the weight of 7.1% in 2020. Despite the structure of the DMC/capita, what matters most is the level of the variable. Till the year 2016, the DMC/capita has been increasing continuously, while in the recent years, this variable shows an improvement of the situation, as in accordance with the Sustainable Development Report of 2022. As DMC is directly related to production process, the figure shows that Albania suffers from non-sustainable production.

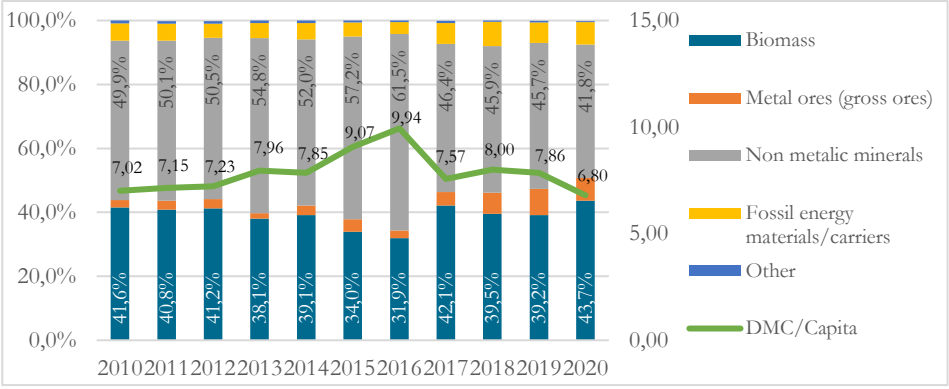

Figure 1: DMC/capita Level and DMC/capita Compound by Category, 2010-2020
Source: INSTAT (2023) and author's calculations.

As for the waste produced by human activity in Albania, it results that the waste being managed has been consideraly greater than that of the unmanaged waste, even though in 2015 and 2016 the total amount of waste generated increased rapidly due to the administrative territorial reform implemented in the country, reaching 91.6%

in 2021. The largest share of managed waste in Albania is of typical family waste compared to industrial waste, as shown in the Figure 2, with the lowest percentage in 2014 with 79.0%.

Again, regarding the total managed waste, or urban waste, Figure 3 clearly shows the large weight of organic waste throughout the entire period under consideration, where it is noted that especially starting from 2018, their weight reaches values around 60% of the total waste generated. This is an indicator that too much food and other organic products are not being produced and consumed efficiently. Next categories weighing more to the total are that of plastic, paper and paper-board and glass respectively, reaching 8.7%, 8.5% and 4.6% in 2021. The data for these categories can be seen as related to packaging, showing the non-friendly approach of the consumer to nature. From the Figure 3, it is noticeable that for the first two years of the period, e-waste marked significant values, specifically 9.0% and 8.1%, while for the following period, the weight of this type of waste has been relatively low, as one the three main waste types prioritized to be prevented by the Governance. Relatively important weights seem to have solid waste with the greatest values of all the time in 2016 with 11.9% of the total waste generated.

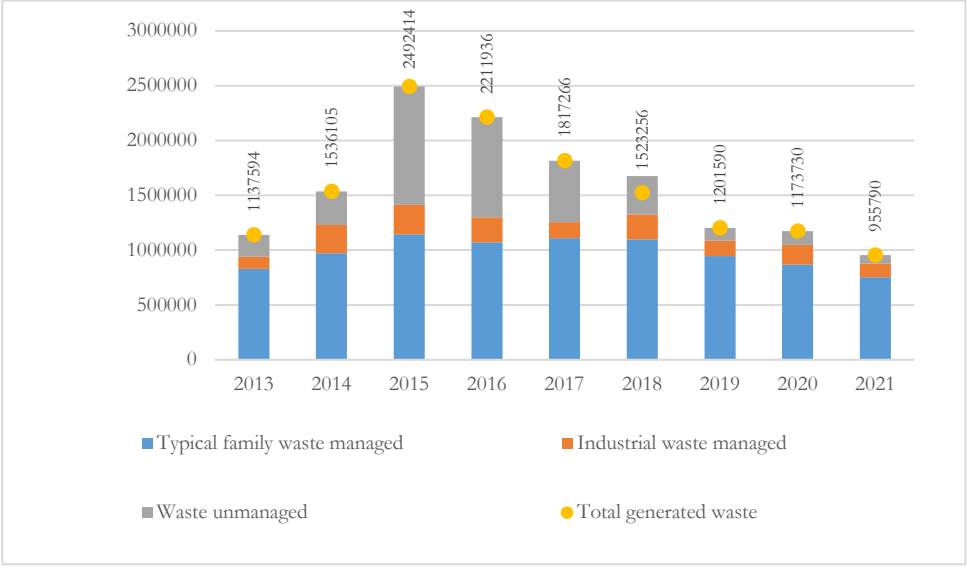

Figure 2: Waste (in tons), 2013-2021
Source: INSTAT (2023).

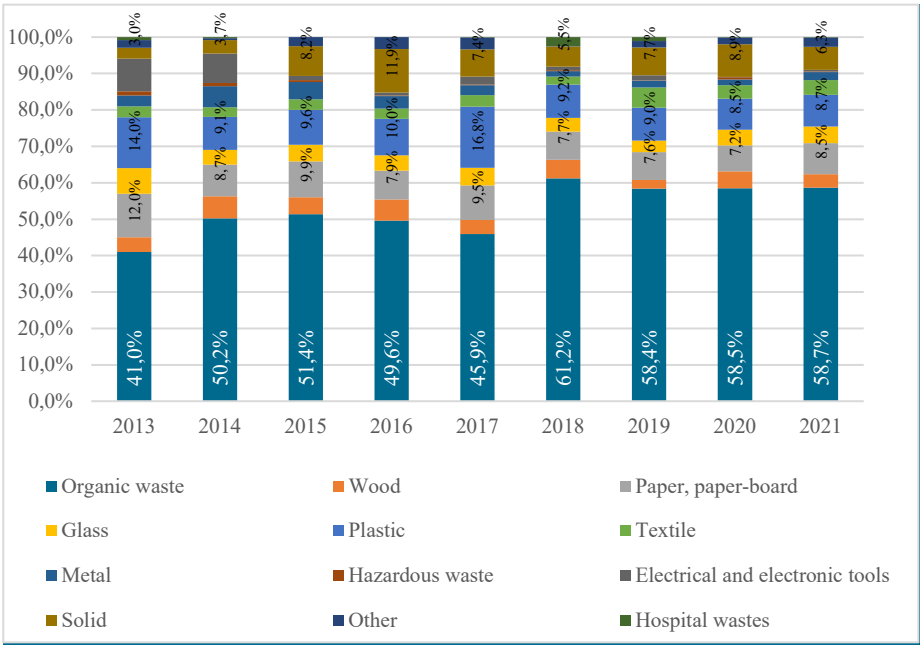

Figure 3: Managed Waste Compound, 2013-2021
Source: INSTAT (2023).

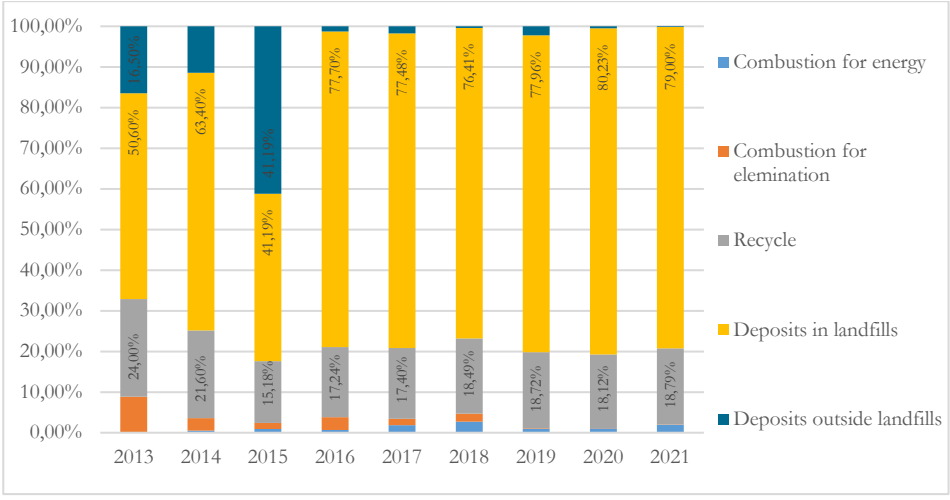

Figure 4: Managed Waste Compound by Treatment, 2013-2021
Source: INSTAT (2023) and author's calculations

As to the waste treatment, the annual data for Albania indicate for a non-sustainable management waste system. Most of the waste generated is deposited in landfills, maintaining the values of around 80% in the recent years. Deposits outside landfills seems to be an old method of waste treatment, where it reached the value of 41.19% or over 970 thousand tons in 2015 and only 0.21% or 1811 tons in 2021. The most advanced waste treatment method in Albania, the recycle one, is not yet largely implemented, with percentages around 15%-24% over the years (Figure 5). Nor the compound weighs, neither the compound nominal values, do not show for a specific trend of the use of recycle principles in being friendly with nature.

5 Discussion and Conclusion

The analyse suggests that it should not only taken care about the quantity of production and consumption increasing, but more importantly on what types of resources are used in the production processes and on what type of goods are therefore produced and/or consumed. Even though being on track, DMC/capita levels continue to be relatively high, demonstrating that Albania must work in direction to efficient use of natural resources and make the production more sustainable and not that reliable on scarcities.

On the other hand, considering that even though most of the waste generated in Albania is managed, there are many categories of waste that can be reduced or even prevented, such as those related to the loss or spoilage of food or packaging. This can be said, considering in addition the fact that their treatment methods are still in undeveloped stages and not in accordance with the '3R' or '5R' and no longer with '9R' principles.

This paper is an added proof that suggest each of the economic agents should take care about how much and in what way they use natural resources, transforming their relationship with the environment and aiming to increase resource efficiency. A zero-waste culture is crucial to be created and preserved in Albania.

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BUSINESS SCHOOLS DEVELOPMENT SUSTAINABILITY THROUGHOUT STRENGTHENING THE THIRD SECTOR AND CIVIL SOCIETY CAPACITY

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Abstract The purpose of this contribution is to discuss how business schools can facilitate Community-based research processes to make more effective citizens' participation in decision-making processes and strengthen third sector and civil society capacity. Research finding show that business schools have the potential to strengthen the third sector and the capacity of civil society to play a key role developing sustainability. Sustainable Development Goals (SDGs) aim at tackling important social challenges of our times, among them peace, justice and strong institutions [SDG 16], making clear that the 2030 Agenda for Sustainable Development is focused on decision-making with particular emphasis in the participation of vulnerable and marginalized communities. Citizens are constantly balancing their power and are increasingly concerned to understand the structures and processes that enable them to participate effectively in decision-making processes. Strengthening civil society through the review of the structures, processes to enable effective and respectful attitudes is recognized. It offers means to improve citizenship competences for their effective participation in the construction of the public domain. Finally, it proposes attention on the organizational learning of the third sector and civil society organizations.

Keywords:
civil society,
third sector capacity,
community-based research,
active citizenship learning,
business schools,
social sustainability

JEL:
A13, H41, I23

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1 Introduction

This paper presents social responsibility in the frame of the economy and business in general based on research developed in a business school supporting Third Sector organisations concerned with community development and social transformation. Community organization has emerged as a policy concern, especially by clarifying how can research – and research-based evidence contribute to the development of strategic responses to these potential opportunities and structural social transformations (Mayo et al., 2013). Social transformations are at the center of enabling citizens who are not against democracy and have not lost confidence in the political class and in their institutions (Castells, 2020). How can citizens enable their effective participation in the process of decision-making?

As civil society becomes stronger its demands on the state increases, something which requires a better organisation of both the state and civil society something that means mutual constitution. The self-organisation of civil society needs of a social context that respects democratic principles, which are widely explained in Political Theory; and also, are necessary to understand the processes of self-organisation, that have been the concern of systems thinking and cybernetics.

Increasingly social work has approached the contemporary theories of knowledge democracy that emphasize the importance of 'co-construction of knowledge', respect for the knowledge-creating powers of local people and local organizations, and those arguing for trans-disciplinarity and sustainability in higher education. But demonstrating that Community Based Research (CBR), whether independent of a university or in collaboration with university-based scholars, is complex and can influence positively the learning of both theory and practice (Tandon, 2016).

This contribution presents firstly, reflections about civil society self-organization and in what ways it relates with social transformations in democratic processes, secondly, discusses CBR methodology as a co-production process to develop community capacity building processes, thirdly, it brings research finding and finally, it concludes with remarks about challenges and dilemmas of this kind of research.

2 Theoretical Background: Civil Society Self-organization

Citizens are the elementary components constituting the agents of our democracies. Their competencies, values and resources are essential in securing principles like freedom, human dignity and social justice and solidarity. Clearly requires that all can have the opportunity to become active citizens, which means eliminating any economic or social barrier to the participation of disadvantaged groups (Kymlicka, 2002). It requires an understanding of these processes of constitution and mutual influence between democratic structures, organizations and citizens possibilities to be agents.

Active citizenship, community organizing and development have emerged as topical, if highly controversial, policy concerns over the past decade and therefore the question is how can research provide support to organisations facing these challenges? Drawing upon the learning approaches developed by Paulo Freire (Freire, 1972) to understand structures of power, by articulating, disarticulating and rearticulating community journeys we can start creating a new empowerment process.

Civil Society (CS) organization has not been given, in fundamental ways, enough attention. Self-organisation of CS implies that certain groups are more able than others to obtain help from the state and this is, in most cases, owing to organisational competence. Thus, it is essential to help to improve the competences of those who are less successful. It is not sufficient in civil society to say ´organise yourselves and go out to work', the state must also provide the assistance that associational life requires, above all protecting the weakest (Walzer, 2002). To transform it into a more active contributor to social processes could improve the way in which our democratic societies function, as it will offer a more effective balance to state institutions.

To do something about this problem requires an understanding of the relationships between the state and civil society. The state should enable effective processes of self-organisation in the civil society. The public domain is the primary connector between people and power. The Theory of Civil Society reveals powerful means of enhancing democracy and social solidarity (Young, 2000).

We use the idea of organisation as a closed network of people in interaction more than an institution legally established; an organisation can emerge from institutionally distributed resources sharing focus on the same policy (Beer, 1979; Espejo, 2000). Citizenship is a property that emerges from the way we relate to each other. As human beings we give meaning to our existence in a relational process something that occurs in a permanent negotiation of individual and collective meaning creation (Mendiwelso-Bendek, 2002).

In particular, this paper emphasises citizenship as a *property* that emerges from the way we relate to each other. As human beings we become fulfilled by relating to others, something that must occur through permanent negotiation (Mendiwelso-Bendek 2002, 190). Citizenship is observed as a stable construction that emerges from the way in which we relate to each other and which we build in our moment-to-moment communications. To understand the idea of citizenship as a stable construction in addition to status, feeling or competence, it is necessary to point out that we as citizens are producing the contexts, we belong to at the same time of being constituted by these contexts (Espejo, 2000). It is an observation of ourselves in concrete relations. It is a systemic observation. The systemic observer acts inside and outside the action. From this perspective we simultaneously observe ourselves as actors and observers, in a circular causality (von Foerster 1982, 808). In this relationship between action and observation, observation and accion can be improved. Observation of our interactions such as observation that achieves enough stability to maintain the system independent of particular actors and time, produces observational closure (De Zeeuw, 1995). Observational closure allows us to identify the patterns of the interactions and we can observe individual and collective interests simultaneously, independent of time. Especially the observer is observing the consequences of his/her actions in the dimension of the whole. When a collective achieves observational closure the natural variations of individual action are contained by the collective's stability; this is a social system with particular (emergent) properties (Espejo, 2000). This requires a systemic horizon, which implies understanding the consequences of our actions on all those potentially affected by our actions, which means the ethics of the action and at the same time to the ethics of the consequences of our actions. We are adding the ethic of responsibility to the ethic of action, according to Cortina (1998).

3 Participatory Action Learning and Research Approach

This research is underpinned by Participatory Action Research (PAR) which has roots in the works of Fals Borda (1990) and Freire (1972). It draws on direct interaction with citizens outside academia and constitutes the basis for the articulation of 'science and society' used by the European Union Horizon 2020 programme. In alignment with CBR principles, this research is applying learning and research-based methodological approach that starts from citizens' own perspectives, expectations, issues and knowledge. Citizens are actively involved, as actors and researchers, in the formulation of research questions, determining the tools, and developing the project. The research projects offer a space for academics and citizens that enables open, ongoing, participative research to generate learning, evaluation, and impact. It generates a mutual co-learning process, academic researchers and citizens co-creating knowledge and practices to improve learning structures and to articulate decision making processes. Participatory evaluation is essential part of the whole process and is embedded in each stage. This is enabling meaningful public participation and democratization of knowledge. All outputs and publications are making visible the contribution and participation of all those involved in the project.

Specific area is allocated to constructed conversations attending civil society self-organising processes. Attending the complexity of civil society self-organising community processes, community-based research naturally is engaging in co-production knowledge and practice. Increasingly work has approached the contemporary theories of knowledge democracy that emphasize the importance of 'co-construction of knowledge', respect for the knowledge-creating powers of local people and local organizations, and those arguing for trans-disciplinary and sustainability in higher education, demonstrating that can benefit the learning of both the theory and practice (Rajesh et al., 2016). Lincoln Business School research has been working with third sector and community organisations, local groups for community development, engagement and empowerment, especially aiming to connect with vulnerable, disadvantage and marginalized ones (Mendiwelso-Bendek, 2015; Herron & Mendiwelso, 2018).

Constructing conversations forms an important part of our participatory research approach and builds on earlier Conversation Theory (Pask, 1976). extends this to further discussing the relationship between communication, conversations, and knowledge to help the conceptualization and understanding "what takes place when effective communication occurs, the process of coming to know where one participant in a conversation can be said to understand another participant's "knowledge".

In our work, the creation of opportunities for conversations of various forms is central. These are not any conversations, but "…conversations that observe, analyse and reflect about community and authorities' organizational practices, processes and structures. These are conversations of civil society about barriers, opportunities and learning in processes that influence decision making processes" (Mendiwelso-Bendek, 2015, 909).

4 Findings

Our community research and learning programme has been focused in a local city where the City Council, local residents and community project programmes and the University have been developing active learning and action spaces with community groups (including young parents, aging groups and newly-arrived communities) to help contribute to shaping local community plans and to develop community capacity. In the urban context the city has also seen rapid changes to its population demographics, with inward migration that has brought international students and also isolated communities. The City Council has repeatedly sought to create mechanisms to engage local residents in ongoing constructed conversations to help shape agendas and impact on the creation of the formal local plans and has worked with researchers as part of this wider activity (Herron & Mendiwelso-Bendek, 2010; 2018).

It is found that for active citizenship it is necessary not only to increase stakeholders' competencies but also make effective those organisational structures relevant to the policy issues of concern. However, and this is a key reason to increase people's competencies, these structures are the outcome of self-organising processes shaped by those who are better organized, with more resources and in positions of power (Espejo & Mendiwelso-Bendek, 2011).

The point that has being emphasized is that there are major challenges for civil society in the current context, whatever the policy makers suggest to the contrary, in terms of the potential opportunities to be grasped. In this increasingly marketized policy framework, organisations concerned with community development need to be more effective than ever, bidding for resources and tendering for contracts, but without losing sight of their distinctive values and missions in the process (Mayo et al., 2013; 2019).

5 Conclusions

Citizens are constantly balancing their limits of power and are increasingly concerned to understand the structures and processes that enable them to participate effectively in decision-making processes. Strengthening civil society through the recognition of the need to review the structures, processes and enable effective and respectful attitudes is recognized. Third sector organisations, as key players in the area, have an enormous journey to develop organisational learning capabilities to play effective action and impact dealing with the current social challenges.

Agents can enable their self-organisation through their own resources and creativity or through the support of external agents, such as researchers, NGOs, government agencies, private trusts, philanthropy or others forms of support. Accepting that self-organisation is inherent to the complexity of social processes, the challenge for us is to work out how to make these self-organising processes more effective. How can citizens of a community improve the quality of their own interactions? How can these citizens co-create desirable values in their interactions with external enablers, such as organisations and policy-makers?" (Mendiwelso-Bendek & Espejo, 2015, 114).

Community-university research supporting self-organising works with groups and community organisations generate different forms of practices and knowledge and the ability to reflect on that knowledge in a process of 'constructed conversations' (Mendiwelso-Bendek & Herron, 2010; Mendiwelso-Bendek, 2015).

Sustainable Development Goals (SDGs) aim to tackle important social challenges of our times, among them peace, justice and strong institutions [SDG 16], making clear that the 2030 Agenda for Sustainable Development is focused on decision-

making with particular emphasis in the participation of vulnerable and marginalized communities. SDG target 16.7 aims to "Ensure responsive, inclusive, participatory and representative decision-making at all levels"; and the Rio+20 Conference outcome document - the "Future We Want"- paragraph 14 recognizes that "opportunities for people to influence their lives and future, participate in decision-making and voice their concerns are fundamental for sustainable development".

It is necessary to enable an effective organisation of Third Sector Organisations and civil society structures, to produce meaning and solid research evidence for social policies development in the journey of social transformation.

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CUSTOMER GENETIC DATA FOR BUSINESS: EMPOWERING YOUR GENES FOR SUSTAINABLE PRODUCT DEVELOPMENT

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Abstract Recent advancements in genomics have opened up new opportunities for businesses to incorporate customer genetic data into their product and service offerings. From personalized beauty products to individualized music playlists, companies are using genetic data to provide hyper-personalized experiences for their customers. In addition to enhancing customer satisfaction, genetic marketing can also lead to more sustainable and eco-friendly business practices by enabling companies to target their products and services more precisely with fewer resources. However, the use of genetic data also presents challenges related to privacy, ethics, and regulation. This paper aims to explore the opportunities and challenges of integrating customer genetic data for sustainable product development and smart consumption, while also addressing the ethical and regulatory issues that arise with the use of genetic data in marketing.

Keywords:
genetic data, DNA-data, genetic marketing, product development, sustainable development

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1 Introduction

Future survival of businesses depends on the efficient integration of sustainable technologies in marketing and product development. Customer behavior is driven by technology, which accelerates innovation to address sustainability challenges (Gil-Gomez et al., 2020; Drucker & Maciariello, 2008; Bianchi et al., 2022). Customer knowledge is also critical for market survival and growth, and genetic marketing can enable precision targeting and gene-based segmentation considering three categories of factors: (i) environmental factors, (ii) family factors and (iii) customer's genome (Daviet et al., 2022). Recent studies in this field reflect the impact of direct-to-consumer genetic testing (DTC-GT), which have shown to be of a poor predictive value (Martins et al., 2022), and yet it gave rise to novel business models and new market niches on genomic testing market. At the same time, genetic data protection, cyber security and ethical issues in using genetic data for business purposes become even more important with the rise of AI and machine learning. Results from the Genomic Data Governance Survey conducted in the US in 2018 (Briscoe et al., 2020) showed that 50.5% of the American consumers would sell their DNA for $95. However, the potential of integrating customer genetic data into sustainable product development and consumption practices remains largely unexplored.

This paper aims to address this research gap by exploring the potential of using customer genetic data to drive sustainable product development and consumption practices in businesses. It also highlights the need for better governance of human genetic data to ensure ethical and responsible use. By promoting transparency, data protection, and informed consent, businesses can leverage customer genetic data in a way that benefits both the consumer and the company. As genetic marketing and personalized product development become more common, it is essential to establish clear guidelines and regulations to protect consumer privacy (Deliverska, 2013; Daviet et al., 2022) and prevent discrimination based on genetic information.

2 Consumer Genomics and the New Business Models

Genetic testing has become more accessible to the general public due to significant research and development investments, resulting in genomics becoming a mass market in recent years. Ultima Genomics (2022) claimed to offer sequencing of whole genomes at $100, compared to the price of $100 million only two decades

ago. While businesses recognize the transformative potential of genomics (National Human Genome Research Institute, 2021), the accumulation of genetic databases occurs within political, economic, and cultural contexts that reshape them (Burgess, 1999) by bringing forward transformation in consumer behavior patterns and therefore, new business models to respond to these new patterns. Genomics-as-a-service model (GaaS) pushed the emergence of DTC-GT triggered by three types of motivation (Vanhala et al., 2013) for purchase: curiosity, medical needs, or lifestyle factors. GaaS model include comprehensive genomic tests, genomics as part of individual health planning, services based on comprehensive genomic tests, medical precision tests, and restricted trait tests. Yet, a new business model emerged in 2018, in which an individual's genotype is used as a base input for producing personalized material products and services. Panasonic's Genome House project (2019) is such an example, creating living spaces tailored to customers' "DNA preferences". Panasonic's business model places genetic makeup at the core of product development and utilize the human genome as a critical input resource.

3 Behavior Genetics as a Marketing Tool

Behavioral genetics uses quantitative and molecular genetic methods to study the influence of genes on behavior. The field dates back to the work of Sir Francis Galton in the 19th century, who initiated the "nature vs. nurture" debate (Chabris et al., 2015). Behavioral genetics applies a variety of research techniques based on twin studies to learn about the genetic and environmental influences on human behaviour by comparing the traits of biologically and non-biologically related family members (Baker, 2004) to estimate genetic and environmental contributions to behavior. Recent studies in this field suggest that genetic factors may influence entrepreneurial behavior and innovation, as well as specific personality traits related to entrepreneurship, such as risk-taking and willingness to face uncertainty (Kuechle, 2019; Zhao & Seibert, 2006; Kihlstrom & Laffont, 1991; Casson, 1983). Certain proteins linked to these personality traits are affected by genes, and neuropeptides like oxytocin and vasopressin can impact prosocial behavior. Environmental factors can enhance or suppress gene expression, leading to changes in behavior, which is the area of study of epigenetics (Conway & Slavich, 2017). A novel discipline in this field, sociogenomics studies how social and environmental factors interact with an individual's genes and gene expression. It investigates how genes dictate our social

relationships (Beard, 2017) and, for example, whether friends and spouses tend to have similar genetic signature.

However, linking a specific gene to a particular trait is challenging due to the complex nature of the human genome. Gene expression is regulated through polymorphism, which can make it difficult to draw definitive conclusions from research findings (Charney, 2017). Despite the challenges, behavioral genetics has made progress in understanding the influence of genetics on behavior. For example, the "adventure gene" is associated with dopamine production and has been linked to novelty-seeking behavior (Ebstein et al., 1996). However, the complexity of gene expression and regulation means that it is difficult to make definitive conclusions from research findings alone. Nonetheless, the development of new technologies and the continued expansion of genetic testing availability provide exciting opportunities for further exploration into the relationship between genetics and behavior.

4 Sustainable Product Development With Genetic Data

Traditional consumer-centric marketing theory is challenged to revise consumer-centric marketing theory and practice in support of sustainable business operations (Dholakia et al., 2020; Drucker & Maciariello, 2008). Those require systematic innovation and sustainable consumption. On the other hand, innovation and customer knowledge management are essential for meeting customer expectations and improving marketing results, with R&D having a significant impact on a product's resource footprint (Fuchs et al., 2022). Integration of innovative technologies increases chances of success (Muriithi, 2022), backed by a proven positive correlation between innovation, customer involvement, and marketing results (Fidel et al., 2015). Consumers are increasingly adopting circular consumption practices, prioritizing sustainability while primary reasons for not adopting a more sustainable lifestyle are still related to cost, lack of interest in the issue of sustainability and not having enough information (Deloitte-UK, 2022). Thus, it is crucial for businesses to consider sustainability in product development.

Sustainable marketing is about creating and delivering value to customers in a way that preserves natural and human capital (Martin & Schouten, 2014; Peattie & Belz, 2010). It requires a long-term focus and the integration of social and environmental

criteria into conventional marketing processes. Ecodesign, which seeks to fulfill environmental requirements based on SDGs into product development, is a key to a sustainable business strategy (Schäfer & Löwer, 2021; Fuchs et al., 2022). Customer genetic data may be utilized in developing personalized medicine and public health strategies, while behavior genetics can help create goods and marketing efforts that promote sustainable behavior. Epigenetics has the potential to support smart consumption of goods and services by identifying environmental factors that affect gene expression and creating customized dietary and health interventions. On the other hand, sociogenomics may serve as a tool in developing products that encourage sustainable consumption practices through targeted marketing efforts based on genetic and environmental data.

DNA data is a door-opener for nascent customer hyper-segmentation metrics based on hyper-personalization. Machine learning and artificial intelligence now make it possible to identify patterns in consumer behavior and link them to individual genetic markup or cluster of markups in a more precise way. Thus, genetic data may serve as a marketing tool in precision retail (Daviet et al., 2022) and has the power to navigate consumers and educate them to consume smarter in terms of scarce resources and climate changes. For example, companies may develop hyper-personalized products based on individual genetic markup, which would minimize carbon footprint and waste. By integrating customer genetic data as a game changer in product development strategy and corporate social responsibility policies, businesses may improve their brand positioning and support global green transition towards a more sustainable future. However, ethical concerns regarding the use of genetic data, such as potential for discrimination and invasion of privacy should not be overlooked.

5 Genetic Data Privacy and Business Ethics

Incorporating customer DNA-data into a business strategy still raises eyebrows when speaking about data privacy and ethics. Legal framework around the world treats genetic data differently or depending on the specific company's privacy policy, as in the US. Within the European Union, genetic data falls under the scope of GDPR as part of the personal data, and therefore it is protected by law (Consumer Federation of America, 2020). Genomic data management is considered by bioinformatics as big data problem (Reali et al., 2018), which suggests effective

regulatory and software tools for safe storage and sharing to prevent maleficent deeds. With the rise of synthetic DNA technology as a promising data storage solution due to its high-density data storage capacity, longevity, and durability, analogically, it raises significant ethical concerns regarding privacy, security, and potential misuse of sensitive information stored in DNA. Human DNA data has several key features which make it so challenging to handle: (i) immediate identification by a small sample of customer's DNA; (ii) ability to provide information about customer's relatives without their knowledge or consent, and (iii) genetic data does not change over time (Daviet et al., 2022). Customer DNA data as big data may be subject to cyberattacks and discriminatory practices as warrantless surveillance, restricted access to health or other social resources, restricted entry into a country (Deliverska, 2013; O'Doherty et al., 2021) and other intentional and unintentional harms. Primary dangers identified by consumers while providing their genetic data are: (i) denied employment, (ii) provision of unacceptable offers from health insurance companies based on customer's genetic predispositions to diseases, (iii) risk of discrimination in job search and (iv) risk of "identity theft" and of cloning without explicit consent (Briscoe et al., 2020). Moreover, recent studies showed that DTC-GT reports, offered by key market players are not supported by solid scientific evidence and may undermine consumers' trust in general medicine (Delfanti, 2011). Therefore, it is crucial to develop strong ethical guidelines and policies to regulate the use of genetic data for business purposes and protect consumer's privacy rights to promote sustainable product development and to ensure customers that their DNA is safely stored and governed.

6 Conclusion

Authenticity is the top competitive advantage in content management. Genomics can create personalized products and services based on customers' genetic makeup, enabling hyper-personalization. Genomic marketing uses genetic data for profiling and one-to-one segmentation, revolutionizing product development by creating products and services sui generis. Achieving full sustainability is theoretically impossible due to the exponential increase of entropy over time (Ljungberg, 2007; Schäfer & Löwer, 2021). However, businesses can contribute to sustainability by promoting smart consumption and demand for sustainable products and services and positively affect society and the environment. Dr. Francis Collins, director of the National Institutes of Health (NIH), said that "genetics loads the gun, and

environment pulls the trigger." Businesses, as a part of that environment, have a unique opportunity to promote sustainability by educating consumers in smart consumption, encouraging demand for sustainable products and services, and ultimately pulling the trigger in a positive way with the help of genetic data.

Future research could explore new marketing fundamentals that reflect novel models of RFM segmentation to identify new purchasing behavior patterns, observation and analysis of CLTV of DTC-GT consumers and developing a framework for innovation management of DNA-based products and services. All of these would support sustainable product development practices to align with the SDGs, particularly SDG 12: Responsible Consumption and Production. One approach to that might be Schumpeter's *creative destruction* (1950), which describes the process that sees new innovations replacing existing ones that are rendered obsolete over time to tackle innovative practices in response to intense environmental changes. In all cases, genetic data governance should be adequate addressed by legal bodies to ensure consumers' privacy data is well protected, which genetic data extends also to their relatives.

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DEVELOPMENT OF TOURISM SECTOR THROUGH SMALL AND MEDIUM-SIZED ENTERPRISES: THE CASE OF ALBANIA

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Abstract Small and Medium-sized Enterprises (SMEs) are considered the main actors of national and regional development because of their important role in the modern economy. SMEs are job creators and contributes to the competitive state of the market leading to better satisfaction of consumer's need. Tourism is the world's largest industry, making a major contribution to the economies of most countries. Its multiplicative effect generates income from goods and services consumption by tourists and taxes on businesses in the tourism industry, provides employment in services related to tourism and creates jobs in the tertiary sector. The Covid-19 marked a major turning point in its development, intensifying the effects because tourism is a labour-intensive industry and most companies in the sector are SMEs. The aim of this paper is analysing the economic dimensions of sustainability for tourism SMEs, as vital actors for enhancing innovation, competitiveness, entrepreneurship and establishment of an effective innovation system for developing countries. In conclusion tourism brings positive impact on the local economy and entrepreneurial development in particular. As regard, will be given some recommendation on measures and actions which have to be taken by the competent authorities for further stimulation of SMEs taking in consideration the sustainability goals.

Keywords:
tourism, sustainability, sustainable development, small and medium-sized enterprises, Albania

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1 Introduction

Tourism is considered an important socio-economical phenomenon which is characterized by dynamic development, resulting in many positive direct as well as indirect economic effects. As an industry that generates income from goods and services consumption by tourists as well as from taxes, this industry provides employment in services related to tourism and also contributes to create jobs in the tertiary sector by having a multiplicative effect. In this context, are of great importance the small and medium tourism enterprises which dominate in the tourist destinations because they provide direct contact with tourists and encourage tourists for spending in a local community. In this regard, the main objective of this paper is to analyze how SMEs can affect the development of tourism in Albanian context taking in consideration the sustainability principles.

2 Literature Review

Tourism has become a worldwide industry and the competition between tourism destinations in the world is increasing. In the global context, tourism serves as an important facilitator for providing employment opportunities and supporting countries' economic growth (UNWTO, 2022). This is because where tourism activity emerges, new opportunities for jobs and economic activity emanates. Tourism is also an opportunity for host community to participate in urban growth, infrastructure overhaul and planning, rural development, environmental restoration, coastal protection and cultural heritage preservation.

The tourism sector is mostly composed of small enterprises and micro-businesses (Mair et al., 2016). Based on the positive advantages of tourism, it is of much interest on analyzing the effect of small businesses in the tourism industry. In today's age of globalization and technology, SMEs, and especially those focused on the tourism sector, face new challenges to be successful in the increasingly complex operating environment within which they encounter unpredictable events at the economic, social and institutional aspects. This is because tourism has proved to be one of the most vulnerable sectors because of economic or financial, health, climate, energy, environmental, political issues, etc. The orientation towards sustainability, both at programmatic, strategic level and at the level of projects, represents a success factor

in the development of tourism, through its multiplier effect highlighted in the related fields (Manolescu et al., 2019).

Looking at more recent studies of resilience in tourism with a focus on private businesses, Badoc-Gonzales et al. (2022) suggest that tourism SMEs are particularly vulnerable to systemic shocks. Existing research suggests that resilience can explain a SME's ability to recover a pre-existing condition after an exogenous shock/crisis, and that SMEs are highly dependent on the resilience of the whole system in which they are embedded (Pal et al., 2014). Resilience is necessary though not sufficient to attain sustainability (Espiner et al., 2017), but achieving tourism sustainability necessitates tourism resilience as an important factor (Saarinen & Gill, 2019).

SMEs are the engine of the national economy, because they contribute in raising the living standards of society by stimulating the economic activity, the diversity of products offered to consumers and creating new jobs. Dynamism, flexibility, adaptability, mobility and their innovative potential are considered to be essential for the harmonious development of the economy and may ensure the cohesion of the economic structure, good economic growth and, of course, creation of new jobs. Furthermore, SMEs' easy access and exit of the markets renders economies more flexible and competitive. However, they face different difficulties which come at two levels. In least developed economies, and in some transition and developing economies deficiencies in both the macroeconomic and microeconomic environments pose challenges: high budget deficits and unstable exchange rates and legal, regulatory and administrative environment poses major obstacles to access of SMEs specially to financing. In more advanced developing countries, where there is reasonable progress in the fundamental institutions, SME may still face challenges in accessing formal finance in the form of bank loans, guarantees, venture capital, leasing and so on.

According the World Travel & Tourism Council, most businesses operating in the tourism sector are also small ones - 80% according to the latest estimate. The contribution of tourism in the economic development on regional and local levels is due to its multiplier effect on the other sectors. There are celebrated cases internationally where small businesses have created an identity for a destination that has subsequently been harnessed by local municipalities. In this regard, tourism offers opportunities to open up businesses which would ultimately benefit the

destination region and its people. As a result, tourism SMEs can also be a source of innovation and help shape destination development.

An economy based on tourism must take into consideration the "sustainable" with the "development" aspects. SMEs operate as a catalyst for local economic development and therefore their sustainable development is vital not only to it, but also as a vehicle for physical and electronic infrastructure investment and popular uptake, and in providing larger frameworks for managing and maintaining prosperity from the natural resource.

However, the reality can be more complex based on the fact that sustainability is becoming a necessity due to changing perspectives around the world. In this regard, the destination-hosting environment must first be environmentally sustainable. However, no matter the size and structure of a company, debate still exists as to whether sustainability efforts are economically justifiable. With this notion, it becomes essential that a company can see strong economic benefit to implementing these new environmentally friendly processes. In this regard, sustainability is important for tourism SMEs for some main reasons:

1. *Economic sustainability:* The development of a healthy economy can serve people's needs and improve their living standards while avoiding future economic crises or stagnation and protecting future generations.
2. *Social sustainability:* Through social sustainability are provided chances for all members of society to be equal, thereby reducing the risk of social conflict or war.
3. *Environmental sustainability:* It is vital to encourage sustainable development through a circular economy, which aims to maximize the use of natural resources while also conserving and improving the quality of life.
4. *Helps improve brand and competitive advantage*: Tourism businesses can improve their brand's reputation, develop trust with partners and the social community by demonstrating concern and respect for environmental and social considerations.
5. *Attract investments and funds:* Many financial and investment experts have found that organizations with sustainability plans are likely to attract investors more than those who do not have one.

The benefits of tourism sustainable development must be expressed in the form of a positive long-term impact for all stakeholders: local communities, governments, investors, tourists, the environment, etc. During the recent years, SMEs have faced major disruptions and unprecedented challenges such as the armed conflicts in Syria and Ukraine, the global financial crisis in 2008 and the COVID-19 pandemic. In conflict situations, internal / external tourist flows change dramatically, causing macroeconomic imbalances. In order to best manage this difficulties, resilience and adaptability are crucial for leading them through continuous cycles of change. Thus, in order to achieve the long-term efficiency, effectiveness and competitiveness of tourism and to strengthen the resilience of the sector, solutions must be identified to neutralize the factors that can generate sectoral crises and to minimize their effects, but also is needed the adoption of some appropriate practices for crisis management. Under these conditions the results obtained will be: improved image of tourism destination (safety and security), increased economic performance of tour operators and the business value, increased operational efficiency, increased societal and environmental protection.

3 Methodology

This paper follows a qualitative research approach. Its point of view presents the idea that SMEs have an important role in the overall economic development of a country. It aims to analyse the economic dimensions of sustainability for tourism SMEs, based on a qualitative research method. In this regard, it provides some descriptive data on the number of SMEs, reflecting their importance in the Albanian economy (taking in consideration that tourism sector is mainly composed by SMEs).

4 The Case of Albania

Tourism is currently a significant contributor to the socioeconomic development of the country, which effects the entire society in many ways by being one the most prominent service sector. According to the Bank of Albania, the income of tourists for the 6 months of 2022 is calculated at around 1.13 billion euros, which highlights its importance in Albanian economy. Tourism is an industry sector that is generally composed of SMEs which play a prominent role in the socioeconomic development of a country especially to the developing ones like Albania. Their role in economic

Table 1: Data on enterprises 2019 – 2021

Indicators	Number of enterprises			Number of employed			Turnover (mln All)			Investments			Value added		
Year	**2019**	**2020**	**2021**	**2019**	**2020**	**2021**	**2019**	**2020**	**2021**	**2019**	**2020**	**2021**	**2019**	**2020**	**2021**
Micro (1-9 employed)	96,924	95,558	97,022	196,403	186,400	191,250	474,255	481,945	582,764	27,863	25,815	30,723	130,770	121,554	147,002
Small (10-49 employed)	5,736	5,674	5,608	114,451	111,347	111,318	729,171	673,675	810,182	78,938	62,475	63,942	143,274	142,153	184,030
Medium-sized (50-249 employed)	1,251	1,173	1,227	122,330	114,767	121,002	583,552	555,661	702,931	58,150	55,151	38,240	147,422	142,847	174,155
SMEs (1-249 employe)	**103,911**	**102,405**	**103,857**	**433,184**	**412,514**	**423,570**	**1,786,978**	**1,711,281**	**2,095,877**	**164,951**	**143,441**	**132,904**	**421,466**	**406,554**	**505,186**
Large (250+ employed)	179	169	174	97,669	91,472	95,669	476,774	436,518	556,363	76,870	50,438	41,104	160,617	142,026	159,031
Total	**104,090**	**102,574**	**104,031**	**530,853**	**503,986**	**519,240**	**2,263,752**	**2,147,799**	**2,652,240**	**241,821**	**193,880**	**174,008**	**582,083**	**548,580**	**664,217**

Source: Instat (2023)

growth has been quite satisfactory and there can be little doubt that small and medium-sized enterprises play an important part in destination competitiveness (www.oecd.org).

In 2021, Albania's 103,857 small and medium-sized enterprises represented 99.8% of all enterprises in the economy. Their contribution to employment in the business sector slightly increased by 2.68 % as compared to 2020. Meanwhile, the investment has decreased by 7.24 %, although the value added has been increased by 24 %, emphasizing once again the important impact they have on the economy. In this regard, Tourism being a multidimensional sector that belongs to many subsectors, more SMEs are needed to be established in this sector to flourish this dynamic industry, especially based on the fact that Albania is an economy dominated by services.

SMEs which are traveler-friendly, nature-friendly and community-friendly are the best promoter of sustainable tourism. In this regard, by being traveler-friendly SMEs create an attractive environment with comfortable facilities for tourists by offering them opportunities to explore and discover the local nature and culture. These SMEs must aim to produce zero waste in order to be nature-friendly. Being community-friendly involves close communication with locals on all aspects of the tourism-related business, employing local staff where possible and constantly looking for ways to promote the local culture. As long as the local people benefit from the tourism business, any SME is likely to be warmly welcomed into the local community and contribute to the tourism development.

5 Discussion and Conclusion

Tourism applies in all economies, it is essentially international in focus, is information intensive, covers a range of directly and indirectly associated businesses, and often has low entry barriers by creating business opportunities for small entrepreneurs in various tourism-related business activities, including in local agricultural, manufacturing, services and construction-related businesses.

It is an industry sector that is generally composed of SMEs which play a prominent role in the socioeconomic development of the country especially to the developing ones like Albania. In this context especially important are small and medium tourism

enterprises which dominate in the tourism destinations according to their number, originating a variety of benefits for them by providing direct contact with tourists and by encouraging tourist for spending in a local community. The prospect of SMEs in this sector is huge through which development of entrepreneurship, enhancement living standard of the local rural people, and poverty reduction by engaging more people in the industry is possible. So, well-developed tourism SMEs is a prerequisite to attain higher growth of tourism. So further studies should be carried out on small tourism businesses in order to identify any support needed by them. Despite the case, future studies should also look into the different impact of foreign and local tourism on small business performance.

The development needs of SMEs must be considered as a system, which operates in relation to yet more complex systems of sustainable environments, sustainable technologies, sustainable cultures and sustainable economies. The sustainability of an economy depends on the introduction of appropriate production, distribution, and consumption to promote environmental sustainability, as well as on economic growth. This is why SMEs, that often constitute the backbone of any economy, should adapt this concept and embed it into their daily functioning and should view sustainability not as a burden, but an opportunity to better promote their business. In so doing, sustainable SMEs will attract the rapidly growing consumer group who are willing to pay more for environmentally-friendly products and services. In this regard, a good start for small businesses stepping towards sustainability is to consider environmental certification.

It is of great interest to encourage the cooperation between SMEs, because the more these SMEs communicate and interact, the more are they likely to satisfy their customers. Such success leads to cuts in transaction costs (economics of scale), sharing resources, and openly discussing further strategies of cooperation. This can be achieved through joint workshops where can be presented the benefits of a "supply chain" consisting in the SMEs that can be included in offering a set of services that are complementary to each other.

In a fast-changing business, political and social world, SMEs need to become better prepared to tackle sudden economic and political shocks, building the resilience needed to navigate an uncertain future. But, there is little empirical evidence on how organizations, especially SMEs, may achieve degrees of resilience.

The resilience of tourism implies the adoption of political and economic measures to improve the response capacity of governments and to prevent the negative effects of crises. In this regard, government have a role to play in:

- Improvement of legislation in terms of accelerating the creation of SMEs.
- Alignment of Albanian legislation in the field of SMEs with European standards.
- Review of fiscal legislation in terms of enhancing tax transparency and easing the tax burden
- Creating support programs, particularly in terms of financial and technical assistance to increase the competitiveness of SMEs towards regional markets, European and international markets.

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Can the Concept of the Common Good be the Foundation of Ethical Marketing?

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Abstract Marketing is currently immersed in a reconceptualization that allows it to adapt its role in an ethical and sustainable economy. From the criticisms of marketing, it is inferred the need for an ethical support for marketing that so it is clear about the ends and not confuse it with the means and that allows a new relationship with people, that transcends their dimension as consumers and treats them as citizens. In this article, we analyze both from a theoretical perspective and qualitative research with marketing professionals whether the concept of the common good is a valid ethical foundation for marketing, as well as whether it is adequate to respond to the current socioeconomic paradigm. By virtue of what was observed in our research, the common good is adequate to guide marketing at the time of change that it is experiencing to adapt to the new social demands towards the company. We believe it is appropriate because it brings together characteristics that resolve the criticisms of marketing observed by consumers and professionals, especially its short-termism that leads it to confuse means with ends and the reduction of people to the role of consumers. Consequently, we conclude this article with a definition of marketing for the common good.

Keywords:
common good, ethical marketing, common good marketing, sustainability, sustainable economy

JEL:
M3, M30, M31

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1 Introduction

Marketing has been criticized for prioritizing profit over the interests of consumers, despite its potential to address cultural paradoxes such as poverty, injustice, and environmental problems (Kotler et al., 2010). To address this negative perception, there is a growing need for an ethical foundation for marketing that prioritizes the common good and establishes a new relationship between companies, citizens, and consumers. This involves recognizing consumers as citizens with rights and responsibilities beyond their role as consumers (Sheth & Sisodia 2005, 160).

Marketing should represent the interests of consumers within the company, not just represent the company to consumers. To achieve this, marketing needs an ethical foundation that prioritizes the common good and fosters a sustainable relationship between companies, citizens, and consumers. This article aims to explore if the concept of the common good serves as a basis for ethical and sustainable marketing, our working hypothesis.

The article will examine the theoretical concepts related to this research question, including the concept of the common good, ethical marketing, and the relationship between marketing and the common good. By exploring these key concepts, the article seeks to provide guidance for marketers committed to ethical and sustainable practices and contribute to a deeper understanding of the role that marketing can play in promoting the common good.

2 Theoretical Background

2.1 The common good

The concept of the common good has been of philosophical and political interest since antiquity, and its definition and application have varied according to the social, political, and cultural context. It is rooted in the recognition of human beings as social creatures who seek a good that extends beyond the individual realm. According to Aristotle and Aquinas, living in a community is not only necessary but also essential for human happiness (Murphy, 2018). In modern times, the concept has been linked to individual and human rights and emphasizes the political conditions in which individuals can achieve their personal ends. While the concept

has been criticized as vague and open to political manipulation (Jaede, 2017), it is currently experiencing renewed interest as it seems adequate to face global challenges.

Definitions of the common good are partial and temporary, never static or universal (Dahl & Soss, 2014). Based on the contemporary utility of the term, we can define it as the one that seeks conditions so that the members of a community can achieve their individual purposes, while generating a whole in the community through relationships or aggregates that allows us to achieve exclusive intrinsic goods of a community (Murphy, 2005). It refers to the contextual conditions that contribute to human wellbeing, such as prosperous communities and environmental sustainability (Haugh & Doherty, 2022).

We can construct a common good identifying the common interest that people have as citizens (Pettit, 2004, 169) We can also face the common good from universalism, defining it as a global concept that includes shared community values, including respect for dignity and human rights and the promotion of social, economic and environmental well-being (Melé, 2009; Kotler, 2019).

There has been a tendency to identify the common good with a value in vogue, such as social justice or sustainability today, but the common good is a concept that, paradoxically, tends to become empty of content when it is identified with a particular value or right.

As a summary of the different contemporary trends, we can say that the common good is a concept whose legitimacy arises from social co-creation and not from a higher authority; process-oriented, not merely a shared social code; actionable, looking for the application and based on the promotion of social justice, equal opportunities, the protection of human rights and citizen participation in decision-making.

2.2 Ethical marketing

Ethical marketing addresses the ethical challenges associated with relationship marketing, technology, and the globalization of companies (Nill & Schibrowsky, 2007). It involves balancing moral principles with economic considerations in the

development of marketing strategies and actions to achieve individual and social well-being and to get marketing to recognize and develop shared utilities (Kadirov & Varey 2014, 193).

The roots of the marketing concept lie in the 1970s, with a clear ethical orientation that limited corporate behaviour (Kotler, 1977; Spratlen, 1972; Dawson, 1980). However, ethical marketing has evolved over time, with various approaches proposed in the 1990s, including virtue ethics (Williams & Murphy, 1990), deontological, pluralist, dialogic ethics (Nill & Shultz, 1997), from the ethics of care. As of the economic crisis of 2008, ethical marketing experienced a new impulse and new directions emerged, such as sustainability, issues related to health and safety, or the treatment of consumers most disadvantaged (Murphy & Martin, 2016).

There are two main approaches to ethical marketing: instrumental, that examines how marketers behave in different ethical situations and normative, that identifies the ideal ethical practices that they should follow (Laczniak & Murphy, 2014). The challenge with ethical marketing is determining what is understood by ethical (Bufalini, 2003). To address this dilemma, different positions have been taken, ranging from hyper-norms to professional self-regulation. Since the economic crisis of 2008, ethical marketing has experienced renewed interest, with sustainability, health and safety issues, and the treatment of disadvantaged consumers becoming important considerations.

Nowadays we can define ethical marketing as the one whose objective is to combine moral principles with economic principles in a balanced way in the formulation of its strategies and actions, getting marketing to recognize and develop shared utilities. It is marketing "practices that emphasize transparent, trustworthy and responsible personnel and/or organizational marketing policies and actions that exhibit integrity as well as fairness to consumers and other stakeholders" (Murphy et al, 2005, XVIII).

In practice, ethical marketing ranges from companies focused solely on economic benefit to those whose primary aim is consumer satisfaction (Smith & Quelch 1996, Sciarelli 2006). Shared values, such as honesty, responsibility, justice, respect, transparency, and citizenship, have been established as a common basis for ethical marketing professionals (AMA, 2020). Ethical marketing typically contributes to a

more culturally sensitive and socially conscious business culture (Tranver et al., 2021).

3 Methodology

To examine our research hypothesis, which states that the common good concept provides adequate philosophical support for ethical & sustainable marketing, we used qualitative conceptual analysis in this study. After presenting a theoretical framework that included concepts such as ethical marketing and the common good, we explored, based on secondary data, definitions and frameworks related to the practice of ethical marketing and the application of the common good in economics and marketing. We used content analysis to analyze various definitions and approaches to the relationship between marketing and the common good and identify relevant patterns or themes. These patterns, themes, and keywords helped us conceptualize marketing for the common good.

4 Results

The relationship between marketing and the common good is relevant because both concepts implicitly address human needs. The most accepted definitions of marketing emphasize the concept of value creation, contribution, and transmission to consumers. The common good is considered a guiding ethical principle in macro-marketing, which uses distributive justice as a tool for implementation. Critical marketing has analyzed the relationship between marketing and the common good for consumers and society to demystify ideological approaches underlying marketing practices and propose new possibilities and visions.

We analysed 13 articles published between 2000 and 2020 that establish a relationship between marketing and the common good. We compiled a table of definitions of marketing and the common good based on the key ideas of the articles (see Table 1).

In the contributions analysed we find that when related with the common good, sustainability and ethical values appear in almost all definitions. The relationship between marketing and the common good is relevant because both concepts implicitly address human needs. The most accepted definitions of marketing

emphasize the concept of value creation, contribution, and transmission to consumers.

Table 1: Summary definitions of marketing and the common good

Author	Key Idea
Mick, 2007	The maximum potential of marketing is in the good common (in addition to **socio-ecological** obligations and public appreciation).
Mish and Miller, 2013	A sustainable aggregate marketing system allows resources to be managed to satisfy needs and wants while being **constrained by social forces and natural resource limits**.
Pittz et al, 2019	Common good as a guiding ethical principle and distributive **justice** as a tool.
Sherry 2013, Saren 2007, Tadajewski and Brownlie 2008; Zwick and Cayla 2011	May marketing be **humanized and broaden** its vision.
Kotler et al, 2010 Moreno Martínez and Margounato, 2011)	Marketing must be focused on **human beings** and must recognize the global humanity as a subject of rights and deserving of the common good.
Kotler (in Fernandez and Seijo 2010)	Conjunction of 3 objectives: the **well-being of people**, the satisfaction of consumer needs and the profit of the company.
Sarkar and Kotler (2018)	**Activist** brands: their activity protects and serves good common.
Baptista and Suarez (2010)	Marketing and the common good implicitly **satisfy human needs.**
Melé (2002)	Philosophical anthropology, property rights, the nature of the company, business sense, obligations, **corporate responsibilities, other responsibilities** and the resolution of conflicts of interest.
Gaski and Etzel (2013)	**Treat customers fairly** while maintaining product quality, charging reasonable prices, providing adequate service and launching appropriate and truthful messages about their offers (Marketing Mix for the common good).
Sherry (2013)	A geocentric and econocentric orientation that seeks the **systemic common good** and not individual satisfaction.
Urbany (2013)	Marketing as clarity: Companies are obliged **to create a better world** and society, which challenges marketing to establish a relationship between the company and the client based on **honesty and dignity.**
Sherry (2013) Hardt and Negri (2009)	**Lasting happiness** (eudemonia) as a common good and a marketing utopia.

These definitions have a systemic approach and are not based on the objectives of the companies. Humanity and not only customers must be the focus of companies' marketing. Even in the most operational definitions, such as the marketing mix (Gaski & Etzel, 2013), they include ethical values and references to sustainability.

The most accepted definitions of marketing emphasize the concept of value creation, contribution, and transmission to consumers. The common good is considered a guiding ethical principle in macro-marketing, which uses distributive justice as a tool for implementation. The relationship between marketing and the common good for consumers and society help demystify ideological approaches underlying marketing practices and propose new possibilities and visions.

5 Discussion and Conclusion

When analyzing the definitions, we find that it is a contextual common good, adapted to today's society. On the one hand, they try to avoid the common criticisms of marketing regarding the generation of needs and short-termism, and on the other, they try to integrate universal values. They also include complete humanity as a subject, something that also occurs in the latest definition of marketing from the American Marketing Association (AMA, 2017).

As a conclusion, we can say that, according to the current literature, the concept of the common good can provide a philosophical basis for ethical marketing, as well as sustainable marketing.

Based on our analysis, we propose a definition of marketing for the common good: Marketing for the common good is the philosophy, processes and organizational activities that aim to cover real needs of society and facilitate collective happiness by creating value and seeking, through commitment to honesty, justice, sustainability and human dignity, a triple positive impact on the economy, society and the environment.

Due to the limitations of this work, we have had to put aside social and business dimensions that derive from an ethical and sustainable approach to marketing. In future research, both quantitative and qualitative we want to addresss challenges associated with the common good as the ethical support for marketing include the lack of agreement on the concept and potential tensions between ethical considerations and business objectives. Also, we will create a model that includes all this references and offer an actionable path for marketing professionals.

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FUTURE WAYS IN SUSTAINABLE ECONOMIC HIGHER EDUCATION

BOTOND GÉZA KÁLMÁN

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Abstract The purpose of this study is to examine the question of whether the current form of economic higher education meets the goals of sustainable education. In order to do this, author examined whether university students studying economics perform better in a special financial field, in their answers to the question of borrowing. For this purpose, author analysed the results of his own previous questionnaire survey using statistical methods. Among the questions in the questionnaire was selected those that examine theoretical and practical knowledge related to loans. The results show that the level of theoretical and practical financial knowledge of Hungarian higher education students can still be improved. In order to do this, the basic knowledge should be generally taught in the financial courses in higher education, while more specific knowledge should be differentiated. A limitation of the research is that it only examined Hungarian university students, it may be worthwhile searching for foreign students with another query. Its originality, on the other hand, is the demonstration that in sustainable higher education, in addition to the introduction of new educational content and methods, students shall also acquire the ability of lifelong learning.

Keywords:
sustainability, higher education, financial knowledge, lifelong learning, economics

JEL:
A22, G53, Q01

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1 Introduction

The purpose of this study is to examine what sustainability in education means in terms of learning content and methods. The ever-accelerating scientific and technical development and increasingly frequent crises require adaptation. Education is one of the most important areas of the sustainability issue, as this sector lays the foundation for our future. As a result of Industry 4.0, the output requirements of higher education have changed. This study focuses on a special area, financial behaviour and decision-making.

2 Theoretical Background

The economic crisis of 2008 and its effects on everyday people focused the attention of specialists on several key areas. Such an area is, for example, financial literacy, knowledge and efficient management of everyday finances (Kershaw & Webber, 2004). The financial knowledge and behaviour of university students was already a question in early research (Chen & Volpe, 1998; Danes & Hira, 1987). Later research (Altıntaş, 2009) showed that teaching investment skills can remarkably increase the financial knowledge of participating subjects. Studies have also been published in the literature on the relationship between the major studied by the students and the level of financial knowledge (Chemlíková & Svoboda, 2017). Jain & Jain (2018) described that students of economic courses perform 5-35 percentage points better in everyday questions compared to other majors. There is a correlation between the ability to plan long-term and university studies, too (Treger & Wendel, 2021). In such situations, the role of education comes to the fore (Horowitz et al., 2021). After reviewing the literature, author formulated the below hypotheses.

H1. University students studying economics have better theoretical knowledge and practical skills related to loans than their peers studying other subjects.

H2. The development of differentiated financial education programs in higher education is recommended for students studying in different majors

H3. In addition to financial programs, lifelong learning (LLL) skills and competencies must be established in higher education, preparing students to follow future changes and keep their knowledge up-to-date

The performance of higher education is also part of the Global Competitiveness Index of the World Economic Forum (Schwab, 2020). The university rankings used and recognized worldwide (QS, 2020; THE, 2022) can also be understood as indicators of competitiveness. Competitive attractive and valuable study programs attract more students and promote collaboration between the economic sector and higher education (Mian et al., 2020) This promotes the sustainability of both sectors.

In the rest of the article, it will first describe the research methodology, then the study will be concluded by drawing conclusions and summarizing the results obtained.

3 Methodology

The study is based on own previous research conducted in 2019-2020 among university students. This research also became the basis of author's PhD dissertation. The research took place in two phases. The first survey took place in the fall of 2019, and the second survey took place in the fall of 2020. The most important event between the two periods was the COVID-19 pandemic, with the effects of which was the model of the economic crisis situation. This study now analyses a small part of this research based on new aspects. The current goal was to find out whether students of economics majors know more about credit-related theoretical and practical knowledge than their fellow students studying in other majors. The questionnaire used for the original research is a self-developed, voluntary and anonymous paper-based questionnaire. This form allows the highest response rate and the least biasing effect (Dillman & Smyth, 2014; Ilieva et al., 2002; Lavrakas, 2008). After data cleaning and coding, the answers to the questionnaires were processed using statistical methods, used IBM-SPSS, MS-Excel and Jamovi programs for this purpose. In this study, the mainly used methods are descriptive statistics. With the help of these, it is possible to compare the theoretical and practical knowledge and skills of university students in different courses related to credits. 1004 respondents filled out the questionnaire during the first survey, and 1155 respondents during the second survey. On both survey nights, approximately 50% of the respondents were students studying vocational education in economics, the proportion of law students was almost 25%, and the same proportion of respondents included humanities, pedagogy and art students.

4 Results

Based on the analysis of the entire questionnaire, the students were classified into three groups (Figure 1). In addition to the group of students majoring in economics and the group of law students who performed equally with them, the students of the liberal arts-pedagogy-art majors were placed in the third group. An average of 15% of the respondents had credit when filling out the questionnaire. This ratio did not change significantly between the first and second survey. Among humanities-pedagogy-art students, there was an observable increase of 4 percentage points in the proportion of students with loans, while the change in the group of law students is in the opposite direction, they show a decrease of 2 percentage points.

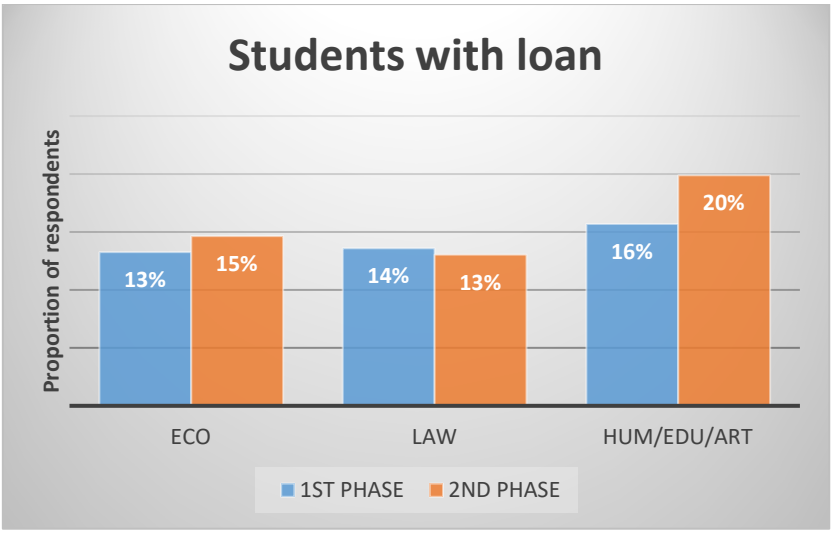

Figure 1: Proportion the students loan payable
Source: Author's calculations.

Examining the typical approach (Figure 2), regardless of the university major, students primarily approach finance from a theoretical perspective. The practical approach characterizes only about a quarter of the students in the entire sample. It can be observed that, as a result of the crisis, in the second phase, the practical activity of economics students decreased, while that of lawyers increased. A particularly interesting result is that the students of the humanities-pedagogy-art majors produced the greatest increase (10 percentage points). This suggests that these students were forced to manage their finances better and more actively as a

result of the changes due to the crisis. The withdrawal of law students from financial matters indicates that they recognized the dangers of wrong decisions and typically reacted to new problems with a risk-averse attitude.

Another question is, that to which part of the practice the interviewees performed best in. As a result, the most important thing for all respondents, regardless of their university major, is to know the total amount to be repaid at the end of the loan term, and the size of the repayment instalments when taking out the loan.

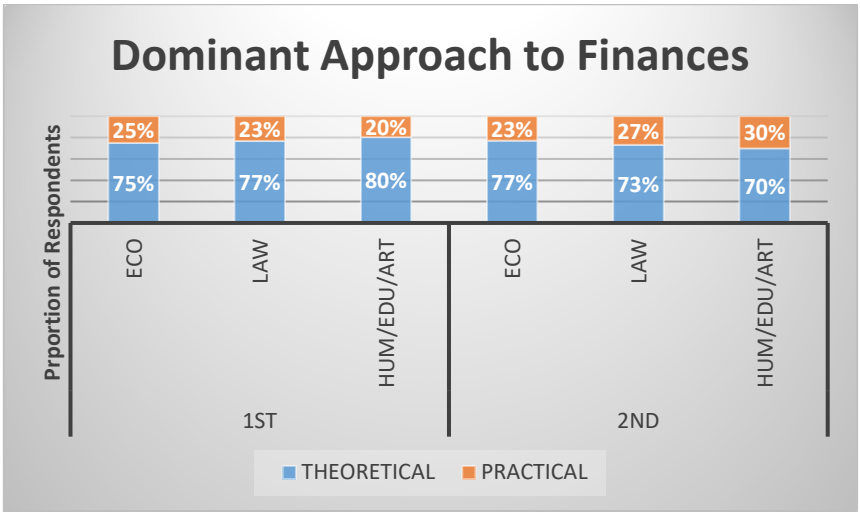

Figure 2: Dominant Approach to Finances
Source: Author's calculations.

Then author examined how students who currently have loans answered the theoretical and practical questions about loans. The most unfavourable of the results is that these students cannot list the items that determine how big the repayment instalment will be. They don't even know what their creditor's financial situation is and what resources they use to ensure their own financial situation. These deficiencies can be seen in all groups of students, regardless of the major they study. Another result worth paying attention to is that 70% of students who do not have credit are aware of the role of credit brokers, that is, that with the help of credit brokers we can save time and costs and have the opportunity to find the most favourable loan for us. Unfortunately, those students who currently have loans to

pay did not use a loan broker at all before making their loan decision. This is true even for students studying economics.

Another pivotal question is a basic mathematical operation already expected at the skill level in high school: interest calculation (Figure 3). In this, the economics students met the expectations, 99% of them answered that they know how to calculate interest. This ratio is the same between students majoring in economics with and without credit. In the entire sample, the same ratio was 90% in the first phase and 87% in the second phase.

The reason for the difference is primarily the lower performance of law students, for whom the performance of those with loans did not even reach 50% at the time of the first inquiry. Among both law students and humanities-pedagogy-art students, the proportion of those who knew the method and process of interest calculation was higher than among students without credit.

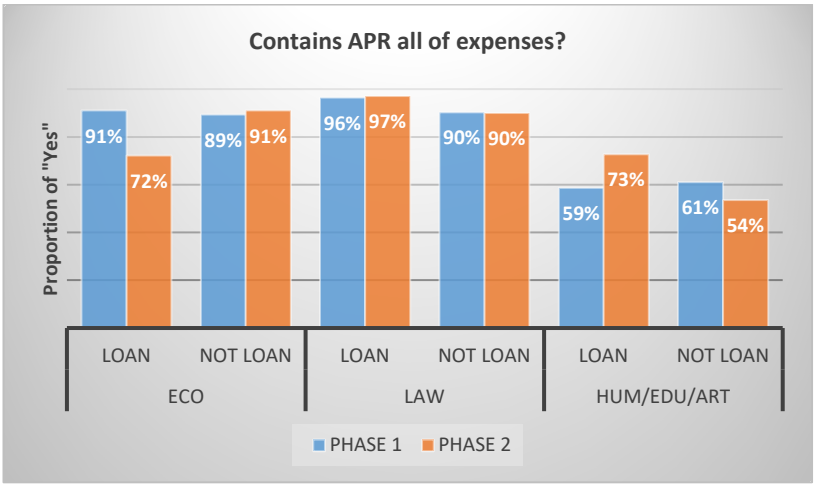

Figure 3: Calculating Interest
Source: Author's calculations.

On the other hand, law students are the best at knowing the Total Loan Interest Ratio (APR). This is true even when we examine law students with loans and even when we focus on law students without loans (Figure 4). The probable reason for this result may be that the law student can answer the question correctly based on their legal knowledge. Economics students are not significantly behind law students,

but unfortunately, economics students who have loans perform worse. Students majoring in humanities-pedagogy-art perform the worst, with 55-75% of correct answers. At the same time, among them, the biggest increase occurred as a result of the crisis: among students with loans: it was found an improvement of 14 percentage points. This indicates that they feel the consequences of the crisis to be the most threatening, so they try to minimize their risks.

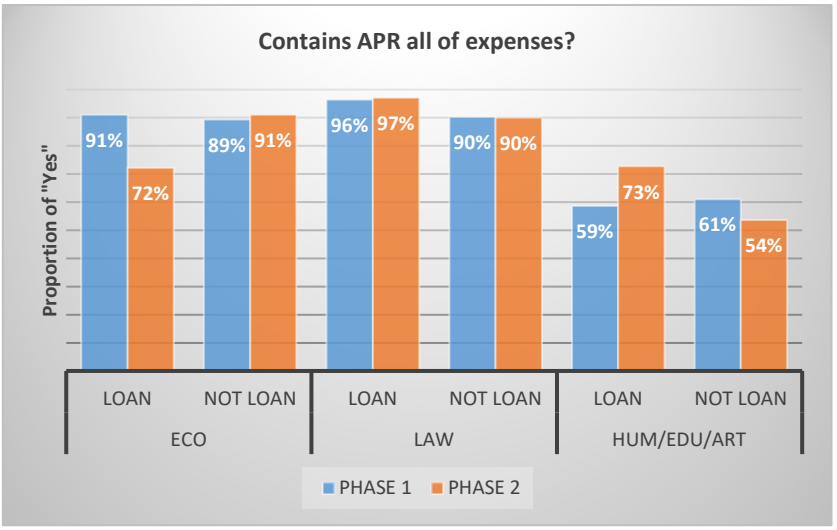

Figure 4: APR Knowledge
Source: Author's calculations.

5 Discussion and Conclusions

The economic effects of crises affect not only states and companies, but also individual people. The knowledge that an individual can use in practice is of paramount importance. As a result of crises, reserves often run out and people are more often forced to take out loans to overcome everyday financial difficulties. These skills must be learned and taught. And the most suitable environment for education is education in the school system. In this study, it was investigated how efficiently this happens in higher education, where there is the last opportunity to teach usable financial knowledge before entering the labour market. It was paid special attention to the students in economics, as they should also perform better than their peers in other majors due to their specialization.

According to results, 15% of students have loans to pay. This data is much more favourable than the latest international statistics, because in these 55% of students have to pay some kind of loan (Forbes, 2022). As a result of the crisis, the number of people taking out loans increased slightly, by 4 percentage points, among students of humanities-pedagogy-arts majors. This represents an opposite change compared to literature data, which indicated a 5-8% decrease (Berg, 2021). The direction of the change correlates with the decrease among law students, but in terms of its magnitude, the decrease according to the literature is higher than the 1 percentage point value was measured. The 2 percentage point increase among students studying economics is a good indicator that these students are aware of the risks of taking out a loan, so they only choose this option carefully.

The approach to the credit question is primarily theoretical, only a quarter of the students approach the problem from a practical perspective. This indicates that teaching of practical tasks should be improved (Faisal et al., 2022; Grijalvo et al., 2022). Although educational methods are being modernized, this does not mean a higher level of knowledge at the same time. This statement is well justified by the issue of interest calculation. As expected, almost all economics students know how to calculate interest. Among students studying in other majors, on the other hand, this ratio is only 47-91%. Humanities-pedagogy-arts students are the least informed about the APR (Annual Percentage Rate), students of economics and law know more than them.

In the light of the above findings, it can be said that the hypothesis H1 was only partially confirmed. Economics students only perform best in certain areas, but in general the performance of law students is similar. Students of humanities, pedagogy and art programs are most at risk. Therefore, hypothesis H2 is accepted on the condition that differentiated education programs must include basic knowledge (interest calculation, importance of APR) for all specializations. However, the H3 hypothesis was fully confirmed. Sustainability in higher education can therefore be realized in two parallel ways: by incorporating new knowledge and methods, and by teaching the ability of independent LLL.

A limitation of the research is that it only examined Hungarian university students, it may be worthwhile to search for foreign students with another query. Its originality, on the other hand, is the demonstration that in sustainable higher

education, in addition to the introduction of new educational content and methods, students must also acquire lifelong learning skills.

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SOCIALLY RESPONSIBLE TOURIST BEHAVIOUR IN THE GORIČKO NATURE PARK

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Abstract The aim of this paper is to empirically evaluate a conceptual model which uses socially responsible behaviour (SRB) as its central component. Past research has focused primarily on social responsibility consequences, but little is known about the impact of a destination's image on SRB. We conducted an opinion poll to test our structural model shaped to measure the SRB. Our sample were visitors to the Goričko Nature Park in Slovenia. After testing the content validity, convergent validity, discriminant validity and reliability of constructs, results show that a) the destination image is an important precursor to three perceived SRB dimensions (economic, social, environmental), and b) that SRB dimensions have a positive impact on visitor satisfaction, intention to revisit the destination, and to spread a positive wordof-mouth. Results provide a comprehensive view of SRB, which proves the important role of the tested constructs as well as the cause, and the consequence for/of SRB.

Keywords:
destination image, socially responsible behaviour, visitor satisfaction, revisit intention, Goričko nature park

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1 Introduction

Corporate social responsibility (CSR) has become a central concern in the business world. CSR-oriented organisations are aware of the interdependency between their employees, environment, community, business partners, and good management, and thus responsibly sum up their decisions and activities to sustainable development, including the health and well-being of the society, and transparent and ethical behaviour, all in accordance with applicable legislation and operating norms, and implement all requirements and norms in their relations (Mulej et al., 2017).

Perceived socially responsible behaviour (SRB) is result of three dimensions and a set of interrelated constructs. Our model is adapted and upgraded from perceived sustainability models for tourist behaviour designed by Kim, Thapa and Kim (2017). Although models were developed to measure individual constructs (e.g. tourist satisfaction, revisit intention) related to perceived sustainability (Kim et al., 2017), we have not found factors influencing the SRB. Among the antecedents of factors influencing SRB, our research includes the destination image; among the consequences, we included visitor satisfaction, revisit intention, and positive word of mouth (WOM).

Based on the above, the main aim of our research was to investigate whether the destination image affects the perceived SRB in the GNP, and which are the consequences of the perceived SRB in the destination.

2 Conceptualization of Socially Responsible Behaviour and Related Constructs

The concept supposed to influence the SRB is the *destination image*; it is considered to be *the* element that makes the differentiation between tourism destinations possible, and an important criterion in the decision-making process which destination to choose (Lee et al., 2014). The concept "destination image" consists of people's beliefs, ideas, and impressions about the destination (Chaulagain et al., 2019).

Destination image has not yet been extensively researched in relation to the SRB. Papadimitriou et al. (2015) argue that tourists form behavioural intentions towards a destination based on general perceptions. Some other authors expose the subjective perception of tourists (including choice of destination) (Chaulagain et al., 2019; Chen & Tsai, 2007). The destination image – as perceived by potential customers – is crucial for their post-trip evaluation and their future behaviour (Zhang et al., 2014). On this basis, we propose the first three hypotheses:

H1: The perceived image of the Goričko Nature Park (GNP) has a positive effect on *socially* responsible behaviour of visitors.

H2: The perceived image of the GNP has a positive effect on *environmental* SRB.

H3: The perceived image of the GNP has a positive effect on *economic* SRB of visitors.

Customer satisfaction is a frequently researched concept (Keshavarz & Jamshidi, 2018; Milfelner et al., 2010). It may derive from SRB. Some research (Chu, 2002) is based on Oliver's (1997) expectation dis/confirmation theory, defining satisfaction as the degree up to which a product (or service) satisfies the customer's pre-purchase expectations. Satisfaction thus reflects the difference between consumer's prepurchase expectations, and the after- purchase evaluation (Milfelner et al., 2010).

The concept of sustainability with the triple bottom line model (Elkington, 1994) strives to minimise negative social, environmental, and economic impacts of the organisation; it became an important component of the CSR, as it shows that such approach enables the organisations to also achieve economic goals (Latapí Agudelo et al., 2019).

CSR and sustainable development are interdepending, and do not function without each other (Lawrence, 1993). Literature review shows that all three sustainable development dimensions (social, environmental, and economic) have a positive effect on tourist satisfaction (Basak et al., 2021). Therefore, we propose the next three hypotheses:

H4: Perceived *social* responsibility of the GNP (as a tourism destination) has a positive effect on visitors' satisfaction with the destination.

H5: Perceived *environmental* responsibility of the GNP (as a tourism destination) has a positive effect on visitors' satisfaction with the destination.

H6: Perceived *economic* responsibility of the GNP (as a tourism destination) has a positive effect on visitors' satisfaction with the destination.

The *intention to revisit* can also be a result of SRB; it is therefore crucial for tourism organisations as repeated visitors cost less than attracting first time visitors (Xu et al., 2021); further, Chen and Tsai (2007) argue that revisit intentions involve "visitor's judgement of the likelihood" to revisit the destination.

In their research model, Kim, Thapa and Kim (2017) confirm the significant impact of sustainable development on revisit intention. Similarly, Su and Huang (2018) note that a destination's CSR has a positive effect on tourist satisfaction, which, in turn, has a positive effect on the revisit intention. We therefore set the following three hypotheses:

H7: Perceived *social* responsibility of the GNP has a positive impact on the revisit intention.

H8: Perceived *environmental* responsibility of the GNP has a positive impact on the revisit intention.

H9: Perceived *economic* responsibility of the GNP has a positive impact on the revisit intention.

WOM plays an active role in destination promotion among relatives and friends (Quan et al., 2021): it is considered an important source of information (Chao et al., 2021). WOM can create a favourable image of a destination and increase its visibility (Chao et al., 2021).

Literature shows a significant relationship between different types of behavioural intentions and WOM in the tourism context. Even more, CSR has a direct impact on customer's willingness to buy and is related to customer loyalty (Lee et al., 2012). Such consequences are manifested through consumer behaviour (e.g. WOM). We tested the positive WOM consequences with these final three hypotheses:

H10: Perceived *social* responsibility of the GNP has a positive effect on positive destination WOM.

H11: Perceived *environmental* social responsibility of the GNP has a positive effect on positive destination WOM.

H12: Perceived *economic* social responsibility of the GNP has a positive effect on positive destination WOM.

3 Methodology

Measuring instrument

Based on the literature review, we first selected and adapted the questionnaire items. 6 items for the SRB were adopted from Sánchez-Fernandez et al., (2019) and 8 further items from Kim et.al (2017). The six items applied for the field of visitors satisfaction, and the four items applied for assessing the destination image were based on scales previously used by Milfelner et al. (2010). Items measuring the revisit intention were adopted from Tosun et al., (2015) and Wang and Hsu (2010). Finally, for WOM, three items were based on the measurement instrument constructed by Kim et al. (2017). Individual statements were measured using a 5-point Likert scale (1 = not agree at all; 5 = fully agree). Visitor satisfaction was assessed using a 5-point scale with values reaching from "very dissatisfied" to "very satisfied". In the next step, the indicators and relevant definitions were reviewed by two tourism- and one marketing experts. In addition, five potential visitors to the GNP assessed the scales.

Sample selection and description

Data was collected by printed self-completion questionnaires in the GNP. A total of 422 questionnaires were completed. 49 were excluded due to missing data. 373 questionnaires were valid and completed by 41% male and 59% female respondents.

64.3% or 240 respondents visited the destination for the first time. The majority was aged 31 to 40 (30.0%), followed by those aged 41 to 50 (22.5%), and those aged 51 to 60 (20%). 13.4% of respondents were aged 61 or older. Respondents aged under 30 (10.7%) represented the smallest share.

Dimensionality, reliability, and validity of constructs

We used the software AMOS (version 27) to perform a confirmatory factor analysis (CFA) and assess the validity of our measures. CFA shows the multidimensionality of one scale (SRB). In total, four items were eliminated one after another according to the modification and fit indices. The final model contained 12 indicators for the SRB, 5 indicators for the perceived image, 4 indicators for visitor satisfaction, and 3 indicators for revisit intention and for WOM. The measurement model converged with an acceptable fit ($\chi 2$ 563.289; df = 301; RMSEA = 0.048; TLI = 0.978; NNFI = 0.988; CFI = 0.990 and GFI = 0.904.).

All indicator loadings exceeded the value of 0.7. Composite reliabilities reached a value of 0.9 and exceed the proposed 0.6 threshold, meaning that measuring instruments are well operationalized. Similarly, results of convergent validity for all constructs (AVE coefficients ranging from 0.841 to 0.989) show that coefficients are suitable and satisfy the criterion that the coefficient should exceed 0.5 (Diamantopoulos & Siguaw, 2000).

4 Results

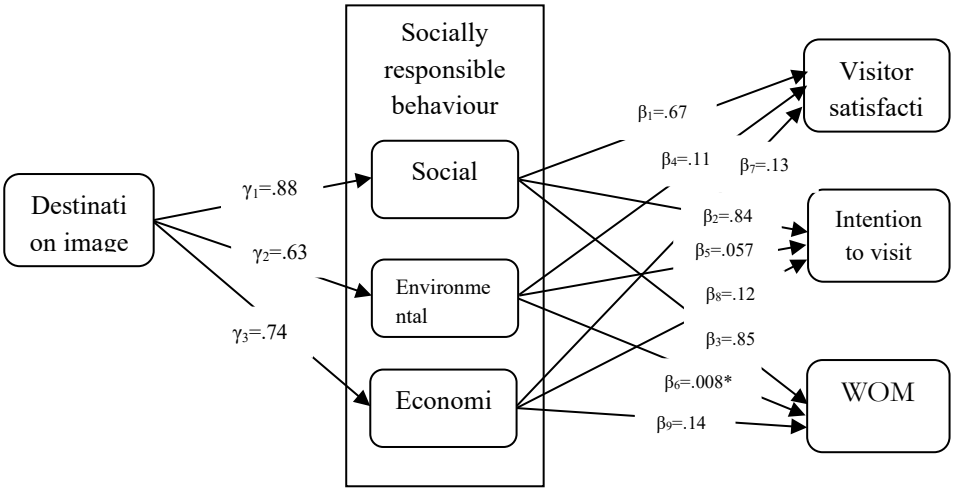
The parameters in the structural model were estimated using the ML estimation procedure. The model showed good fit to the data: $\chi 2(276) = 540.292$; GFI= 0.900; RMSEA=0.051; CFI= 0.989; TLI=0.987; IFI=0.989. All indices, except $\chi 2$, which was characteristic, were distributed within appropriate intervals.

Results confirm that the destination image has a positive and strong influence on the *economic* dimension of SRB ($\gamma_3 = 0.746$; $p<.001$), on its *social* dimension ($\gamma_1 = 0.889$; $p<.001$), as well as on its *environmental* dimension ($\gamma_2 = 0.633$; $p<.001$). The hypotheses H1, H2 and H3 are confirmed.

The SRB's *social* dimension influence on visitor satisfaction ($\beta_1 = 0.671$; $p<.001$), on their revisit intention ($\beta_2 = 0.844$; $p<.001$), and positive WOM ($\beta_3 = 0.855$; $p<.001$) was positive, strong, and statistically significant, therefore hypotheses H4, H7 and H10 are confirmed.

The SRB's *environmental* dimension has a much weaker influence on visitor satisfaction ($\beta_4 = 0.111$; $p<.001$) and on revisit intention ($\beta_5 = 0.057$; $p<.01$), *as the social one* yet still a positive influence. As it is statistically significant, hypotheses H5 and H8 are confirmed as well. The SRB's environmental dimension path to positive WOM was not statistically significant ($\beta_6 = 0.008$; $p>.05$), we therefore reject the hypothesis H11.

The influence of SRB's *economic* dimension on visitor satisfaction ($\beta_7 = 0.136$; $p<.001$), on *revisit intention* ($\beta_8 = 0.126$; $p<.001$), and *positive WOM* ($\beta_9 = 0.147$; $p<.001$) have a weaker, yet still positive and statistically significant influence, thus hypotheses H6, H9 and H12 are confirmed, too. Results are presented in Figure 1.



* - path significant at p<.001
** - path significant at p<.01
*** - path not significant at p.>05

Figure 1: Structural model and standardized regression paths
Source: Authors' compilation.

5 Discussion and Conclusion

The SRB model used in this research applied at the GNP, which was developed by the authors by upgrading the existing models, presents a new research perspective. The SRB concept assumes a variable with a positive and strong influence on the perceived SRB and that the discussed central concept affects some variables as well.

We conclude that the destination image influence on perceived SRB is positive and strong. This indicates that the destination image contributes to strengthening the visitor SRB in a destination. Destination managers must thus be aware that perceived SRB is a multidimensional construct, where economic, social, and environmental dimensions are crucial.

Research results also reveal that the social dimension of SRB has a positive and strong influence on (i) visitor satisfaction, (ii) positive WOM, and (iii) revisit intention. Research by other authors (Basak et al., 2021; Kim et al., 2017) shows similar findings.

Previous research (Jasrotia et al., 2021) reports that the *economic* dimension of sustainable development usually does not affect tourists' satisfaction, while our research, exploring the impact of the SRB's *economic* dimension on (i) visitor satisfaction, (ii) revisit intention, and (iii) positive WOM shows a weak, yet positive influence.

The interlinkage-analysis between the constructs also showed that the SRB's *environmental* dimension is affecting visitor satisfaction and their revisit intention, while it is not affecting the WOM. This can be explained by the fact that the majority (64.3%) were first time visitors to GNP, and thus could have no place attachment.

5.1 Limitations of the study and recommendations for further research

As the results relate only to the GNP visitors they cannot be generalised beyond the scope of our research. Nevertheless, the conceptual model developed in this study allows further verification by including additional factors, e.g. positive and negative emotions, perceived value, or memory of travel. Qualitative research methods (in-

depth interviews) should be considered in addition to quantitative research: this could reveal more causes and consequences of SRB.

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Balancing Exploration and Exploitation in Organizations: The Role of Organizational Design, Leadership Style and Employee Personality

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Abstract This study examines the relationship between macro- (organizational design), meso- (leadership behavior) and micro-level (employees' personality) organizational characteristics and the individual's ability to manage the exploration–exploitation duality (balancing of exploring new and exploiting existing paths). This study aims to reveal how employees' ability to manage this duality can be enhanced and how these characteristics interact with each other. It is a work in progress, focused on building theoretical background and applying a new research design. An experiment is planned on two samples of Master students with a business background from Austria and Slovenia, using an experimental vignette methodology. Outcomes of this research will enable department and human resource managers to provide conditions at work for employees to balance their intention to explore new avenues while at the same time exploiting existing ones, as both behaviors are necessary to trigger organizational innovation and growth. This study will contribute to the organizational ambidexterity literature by recognizing the contextual and interactive role of macro-, meso- and micro-level organizational antecedents of individuals' ambidextrous behavior.

Keywords: exploration–exploitation duality, organizational design, leadership style, individuals' personality, experiment

JEL: M12, O31

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1 Introduction

In the business world, organizations face an apparent dilemma. On the one hand, they have to cut costs and push efficiency to stay competitive, applying "exploitative behavior" strategies. On the other hand, organizations also have to meet trends and be innovative so that they do not fall behind their competitors in the future, applying "explorative behavior" strategies (Zacher et al., 2016). These are rather opposing behavior strategies, which are difficult to combine and yet it is vital to balance them to secure the organization's future. Notably, the balancing act between exploring and exploiting has always been a challenge; however, due to a more global business world, which comes along with increasing environmental uncertainties and more technical advancements, it has become even more important for organizations in recent years (Birkinshaw et al., 2016).

This paper is a work in progress as part of a bilateral research project between Slovenia and Austria,[1] which focuses on the balancing act of explorative and exploitative behavior to enhance the innovation, and thus secure the future, of organizations. Its goal is twofold. First, the study examines the question of to what extent organizational structure, leadership style and employee personality affect the balance between exploration and exploitation in an organization. As organizational structure represents the macro level in organizations while leadership style represents the meso and personality the micro level, this paper will also contribute to the questions regarding which level – macro, meso or micro – most strongly affects the exploration–exploitation balance. Second, the study aims to reveal combinations of organizational structure, leadership style and employee personality that make it particularly easy to balance exploration and exploitation behavior. Overall, the insights of this study will be valuable for processes regarding organizational learning and development as well as personnel selection. This paper focuses on building a theoretical background and proposing a research design for the project.

[1] Research results are part of research activities of the bilateral Project BI-AT/23-24-033, co-financed by the Slovenian Research Agency (ARRS) and Austria's Agency for Education and Internationalization (OeAD) under the Programme for Scientific & Technological Cooperation (WTZ).

2 Theoretical Background

The maintenance and growth of organizations partly depend on the employees' ability to balance the duality between exploration and exploitation activities (Pertusa-Ortega et al., 2021).

The ability to explore new avenues while at the same time exploiting existing ones is termed "ambidexterity." It represents "the capability of individuals to perform contradictory activities and switch between different mindsets and action sets" (Bledow et al., 2009, 322). Organizations that foster employee ambidexterity remain more adaptive to external and internal changes, appear more flexible in times of crisis and are particularly successful when representing the nonmanufacturing industry (Junni et al., 2013; Luu et al., 2019).

Organizational design, also referred to as organizational structure/architecture, is defined as a configuration of relationships with respect to the allocation of tasks, responsibilities and authority (Jones, 2004). It shapes the actions of employees, thereby directing their activities (Davis et al., 2009). Organizations can be more or less structured – meaning that they show high or low formalization, standardization, centralization and steep hierarchy (Burns & Stalker, 1966; Davis et al., 2009). Research offers a number of ideas on how to implement ambidexterity on an organizational level, e.g., by implementing structural, sequential or contextual solutions (e.g., O'Reilly III & Tushman, 2013; Raisch & Birkinshaw, 2008). However, little is known about how organizational structure impacts employee ambidexterity (Pertusa-Ortega et al., 2021).

Transformational leadership is part of Bass and Avolio's (1994) full-range model of leadership and comprises idealized influence, inspirational motivation, intellectual stimulation and individualized consideration. Research shows that transformational leadership relates to individual, group and organizational performance (Hoch et al., 2018; Judge & Piccolo, 2004; Waldman et al., 2001). Even though the organizational effects of transformational leadership are well researched, up to now no insights exist on whether transformational leadership impacts employee ambidexterity. Based on the circumstance that employees led by transformational leaders feel more inspired, intellectually stimulated and encouraged to go new ways, it is expected that transformational leadership positively relates to employee exploration behavior.

However, when it comes to the question of whether transformational leadership also relates to employee exploitation behavior, expectations are less clear.

Personality traits are important drivers of organizational success on the micro level (Barrick et al., 2001). Personality traits are a central reason for why different individuals act differently in the very same situations. They can be divided into cognitive traits and socio-emotional traits (Kanape & Bergner, 2015). General mental ability (GMA) as a cognitive trait denotes a very general mental capability that involves, for example, the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience (Kanape & Bergner, 2015). Research on the importance of GMA on employee ambidexterity is nearly nonexistent, with the exception of Good and Michel's (2013) simulation study, which revealed that individuals with higher cognitive abilities more easily balance explorative and exploitative behavior.

With respect to socio-emotional traits, most attention has been directed at the Big Five model of personality, which comprises the five traits Openness, Conscientiousness, Extraversion, Agreeableness, and Emotional Stability (Costa & McCrae, 1992). Research on the link between the Big Five and ambidexterity is scant. First results reported by Keller and Weibler (2014) demonstrate that more open individuals engage more strongly in exploration tasks. In contrast, more conscientious employees are significantly more engaged in exploitation tasks than their less conscientious colleagues. It is expected that GMA and openness enhance an employee's exploration behavior while conscientiousness enhances exploitative behavior. With regard to the remaining traits (extraversion, agreeableness, emotional stability) no specific expectations can be derived from research. From the above reasoning we propose the following in a rather explorative manner:

Proposition: Specific combinations of organizational structure, transformational leadership and personality traits are positively related to employees' ambidextrous behavior.

3 Methodology

To address the project's aims an experiment is planned with the three factors 1) organizational design, 2) leadership style and 3) employee personality. As all factors will have two levels, a 2 (high/low structure) x 2 (high/low transformational) x 2 (high/low personality score) between-subjects design is planned. The dependent variables will be the employees' exploitation and exploration behavior. The sample will consist of Master students with a business background from the University of Graz and Ljubljana. Including students from both countries will increase the sample's diversity and will thus result in it being more representative. To estimate the sample size a power analysis was performed, where the alpha level (α=0.05), the power (80%) and the expected effect sizes were taken into account. Based on research conducted by Al-Atwi et al. (2021), we expect a medium-sized interaction between organizational structure and ambidexterity. We also expect a medium-sized interaction between transformational leadership and ambidexterity, based on Weibler and Keller's (2014) research, and a medium-sized interaction between most personality traits of interest and ambidexterity (e.g., extraversion; Good & Michel, 2013). The power analysis revealed a required sample size of N = 158. We aim to collect data of 200 participants to obtain equal sample sizes per condition and thus comply with recent recommendations (Lonati et al., 2018).

Once the experiment is set up, pretested and preregistered, students will be recruited through classes and will be able to sign up for the experiment with a given time slot. As is common in organizational research, the experimental vignette methodology will be used (Finch, 1987). According to suggestions on vignette studies provided by Aguinis and Bradley (2014), we will develop vignettes for so-called "paper people" studies. This means that study participants will be presented with a short and pretested, carefully constructed description (=vignette) of an organization and leader they need to imagine they work for. The description of the organization and leader will be systematically varied. After that, participants will be asked to complete an exploration/exploitation task, which allows their level of ambidexterity to be measured (e.g., What might be the most acceptable way to deal with a product that needs a makeover?). The study participants' GMA and Big Five personality traits will be measured via respective questionnaires (e.g. the Wonderlic Personnel Test, NEO-PI-R).

4 Expected Outcome, Discussion and Conclusion

This research will contribute to research and practice on ambidexterity. First, the study will reveal in what way organizational structure/design affects employee ambidexterity. Based on research outlined above (Sitar & Škerlavaj, 2018), we expect that tightly structured organizations enhance exploitative behavior while loosely structured ones enhance exploration behavior. Second, we will be the first to test the relationship between transformational leadership and employee ambidexterity. We assume transformational leadership increases employee exploration because transformational leaders foster new ways of work and innovation – which are prerequisites of exploration. Third, this study will be the very first to study the link between employee cognitive ability and ambidexterity and it will also be among the first attempts to see how ambidexterity is related to the Big Five traits of employees. Fourth, this study is set up to reveal how organizational structure, leadership and personality interact in terms of employee ambidexterity. As research is scant to nonexistent regarding these questions our project will enrich the literature with unique insights on how to foster ambidexterity.

Regarding practice, two main implications are expected. First, the study will provide us with insights on how to foster individual ambidexterity. This insight can be used in human resource management or organizational learning to set up organizations where employees find the best circumstances to be both explorative and exploitative. Second, learnings from the study findings will inspire managers and leaders on how to change policies to help employees increase ambidextrous behavior. Doing so would be advantageous for contemporary organizations facing disruptions.

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CSR-PERFORMANCE RELATIONS FROM THE HOLISTIC POINT OF VIEW: APPLICATION OF CAUSAL LOOP DIAGRAMS

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Abstract The increasing relevance of Corporate Social Responsibility (CSR) for sustainable development, reinforced by the pandemic and resulting crisis, requires adequate measures of various CSR activities in business operations. Various measures, such as investments in CSR, social costs, CSR index, and ESG index can be identified within the literature. Previous research is mostly focused on partial CSR-performance relation so that integration of these CSR-performance relations into the wider framework is missing. Causal Loop Diagrams (CLDs) as the tools of System Dynamics are selected to integrate these relations into a holistic framework. Given the results of previous research, a CLD representing CSR-performance relations has been created. Some positive and negative links were identified, as well as positive and negative feedback loops which can help predict the company's future behaviour: social costs stimulate net income, which positively influences ROA, EPS, and market value, while investments in CSR lead to lower net income.

Keywords:
CSR,
CSR indicators,
CSR-performance relations,
holistic framework,
CLDS

JEL:
M10, M15

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1 Introduction

Corporate Social Responsibility (CSR), which has become imperative in the conditions of the pandemic, has a different impact on the efficiency of the business operations. According to the stakeholder theory, the company should respect the goals and interests of all stakeholders. Shareholders will certainly be more interested in financial performance, while other stakeholders will be more interested in social responsibility performance, which has three m main dimensions, such as environmental, social, and corporate management. This is especially important for a company in order to sustain in the long term in the contemporary business environment, characterised as extremely turbulent, unpredictable, uncertain and complex, which was the case in the pandemic caused by COVID-19. It is inevitable for the companies to take care of their employees, environment, local and wider social community, as well as corporate governance practices. The question is how the investment in environmental, social and governmental activities is going to reflect on financial and market performance.

Numerous studies confirm the positive impact of CSR activities, measured through certain CSR indicators on business performance (Barauskaite & Streimikiene, 2020; Radu & Smaili, 2020; Bassetti et al., 2020; Broadstock et al., 2020; Albuquerque et al., 2020; Huang, 2021), while some others indicate negative influence (Kim et al., 2020; Demers et al., 2020; Shaikh, 2022). Still, these studies are predominantly focused on the isolated effects of some CSR indicators on performance. Their integration requires appropriate holistic tools. To overcome the identified research gap, we used Causal Loop Diagrams (CLDs) as the relevant holistic tools of System Dynamics to demonstrate various CSR-performance relations, mutual CSR indicators relations as well as mutual performance relations. The main goal of the paper is to emphasize the main decision-making point which can help predict future effects of CSR activities on business performance. The main research question is how CLDs can help predict future effects of CSR activities on business performance.

The paper is structured as follows. After the introduction, literature review related to the main research results indicating the impact of CSR indicators on performance is identified. The methodology is then briefed. The main results, as well as

discussion, follow. Finally, the main conclusions, implications and future research are presented.

2 Literature Review

Proponents of the concept of social responsibility emphasize that CSR activities increase value for shareholders by aligning their goals with those of all stakeholders to increase customer loyalty and employee satisfaction and build a favourable corporate image. In contrast, critics point out that companies try to serve the interests of stakeholders at the expense of shareholders by allocating resources outside of their core business, resulting in lower profits.

Barauskaite and Streimikiene (2020) analyse the benefits and drawbacks of CSR based on a systematic literature review and develop a conceptual framework for linking CSR with financial performance. The authors point out that the companies, which perform socially responsible activities, can achieve a competitive advantage due to creation of a good image and reputation in the public and generate more profit and return on investment. Radu and Smaili (2020) examined how companies balance financial and ESG performance. Using cluster analysis, the authors identified three patterns of corporate performance, which they labelled as financial, balanced, and social responsibility performance. Most companies focused on financial performance (47.6%) and significantly less on ESG performance. The companies that focused on balanced performance (25.7%) had better financial, social, and environmental performance than the average level of the sample. Finally, companies that focused only on social responsibility performance (26.7%) had the lowest financial performance and the best social and environmental performance. The sample included 241 companies in Canada in the period from 2014 to 2018, that is, in the period before the pandemic.

Investments in environmental protection can require a significant cost to the company, which can lead to a negative relationship between environmental performance and short-term accounting measures such as the rate of return on assets - ROA (Kim et al., 2020). However, regarding the market performance measures, which respect future cash flows and profitability (for example, Tobin's q), it can be stated that environmental performance increases the value of the company (Kim et al., 2020). This is because better environmental performance can increase a

company's value by reducing compliance costs, generating net savings, and reducing the risk of environmental lawsuits, all of which put the company in a better position to respond to tightening regulations. Bassetti et al. (2020) examined the impact of environmental performance on economic performance. The results of the research show that environmental performance, measured in terms of environmental orientation and innovation, positively affects the rate of return on the company's assets and capital. Rates of return depend on the capacity of green businesses to generate the same revenue streams as non-green businesses, but with less capital. In other words, green businesses tend to become more efficient in generating future wealth.

Broadstock et al. (2020) examine the relationship between ESG performance and market performance in the context of a pandemic-induced financial crisis. The authors find that ESG performance mitigates financial risk and is positively and significantly correlated with excess returns during the COVID-19 pandemic. This conclusion points to the fact that companies that appreciate ESG performance become more resistant to the crisis caused by the COVID-19 pandemic. R. Albuquerque et al. (2020), also support the fact that companies that respect environmental and social performance have greater resilience to the pandemic. The authors focus on the US stock market and find higher returns, lower volatility, and higher rates of business gain for companies with higher ES ratings in the first quarter of 2020. Some authors find a neutral or even negative relationship between ESG performance and company efficiency under pandemic conditions. Namely, Demers et al. (2020) conclude that the impact of ESG on market performance is not significant in the first quarter of 2020, while it becomes significant and negative during the market recovery in the second quarter of 2020.

Huang (2021) investigated the relationship between ESG activities and company performance and found that there was a positive, statistically significant, but economically moderate relationship, which is in line with theoretical expectations. Bose et al. (2022) examine the impact of COVID-19 on changes in firm value and take firm sustainability performance as a mediator. The authors find a less negative impact of COVID-19 on the value of firms with better sustainability performance. Companies that pay attention to ESG performance experienced fewer declines in value during the pandemic.

Shaikh (2022) estimates that the appreciation of ESG performance leads to a decline in ROA and ROE and thus to a lower market value of the company. The environmental dimension harms accounting and market performance, while the social dimension has the opposite effect, that is, it significantly affects profitability. The dimension of corporate governance reveals a positive impact on business efficiency and the company's market value. Thus, the results of empirical research show that sustainability practices and financial performance are significantly related.

Table 1 shows the selected research results of many authors. Namely, there are selected those CSR and financial performance measures, which are introduced into the Causal Loop Diagram.

Table 1: Researh review on the relationship between CSR and financial performance

Authors	Year	Relationship	CSR measure	Financial Performance Measure
Ahemd, Islam and Hasan	2012	Positive	CSR index based on surveys	Return on assets, earnings per share
Babalola	2012	Negative	Investments in CSR	Net income
Kanwal, Khanam, Nasreen and Hameed	2013	Positive	Social costs	Return on assets, net income
Mentor	2016	Negative	ESG indeks	Market value of the enterprise, Earnings per share
Zakari	2017	Positive	Social costs	Net income, earnings per share

Source: Adapted from Barauskaite and Streimikiene, (2020).

3 Methodology

Taking into account the variety of the above-mentioned CSR-performance relations, we indicate the relevance of their integration into a wider framework. It requires the application of appropriate holistic tools. Therefore, Causal loop diagrams as the tools of System Dynamics have been selected to show how various CSR indicators affect business performance as well as how they are interrelated. One of the main theoretical features of SD is feedback. An information feedback system exists whenever the environment leads to decisions resulting in actions. Such actions in turn affect the environment and thus future decisions (Forrester, 1972, 14). The

basic theoretical assumption of System Dynamics as a relevant functionalist systems approach to management reads as follows: the system's behaviour is preliminarily caused by its structure.

Accordingly, to anticipate the future effects of socially responsible behaviour of the organizations, some tools for representing feedback structure are necessary (Zlatanović et al., 2022). Consequently, causal loop diagrams (CLDs), showing the orientation of feedback as well as the key variables and their mutual interactions, have been used. Variables are related by causal links represented by adequate arrows. Relations that produce a change in the same direction (rising or falling) are marked with a positive sign in the causal loop (Nikolić et al., 2018). The positive feedback link means that "if the cause increases, the effect also increases above what it would otherwise have been. Also, if the cause decreases, the effect decreases below what it would otherwise have been. Opposite to that, the negative feedback link means that if the cause increases, the effect decreases below what it would otherwise have been; and if the cause decreases, the effect increases above what it would otherwise have been"(Sterman, 2000, 139). As Nikolić et al. (2018) emphasize "a positive feedback loop is known as a 'positive loop' (marked as +), or as a 'reinforcing loop' (marked 'R'). A negative feedback loop is known as a 'negative loop' (marked as -) and as a 'balancing loop' (marked 'B'). So, each relation is characterized by a certain polarity", i.e. the direction of effect that the influencing variable has on the influenced variable (Lane, 2008). CLDs can contribute to the ease of communication between decision-makers by helping decision-makers exchange and discuss the set of causal assumptions. In addition, simulation models representing the system's future behaviour can be derived from CLDs.

4 Results

According to the above presented CSR-performance relations, i.e. the research results demonstrating the positive or negative impact of CSR activities on performance, the following Causal Loop Diagram, connecting various CSR indicators and their impact on business performance, as well as mutual relations between business performances, is presented (Figure 1). The Causal Loop Diagram is based on the research results presented in the Table 1.

As it is shown in Figure 1, positive links exist between the following: CSR index and Return on Assets (ROA), social costs and net income, as well as social costs and earnings per share. At the same time, negative links exist between ESG index and the market value of the enterprise, the ESG index and earnings per share, as well as investments in CSR and net income. Additionally, we point to the following mutual relations between business performance, such as positive link between net income and ROA, earnings per share as well as share price; the positive link between share price and market value of the enterprise; while a negative link is identified between ROA and market value of the enterprise.

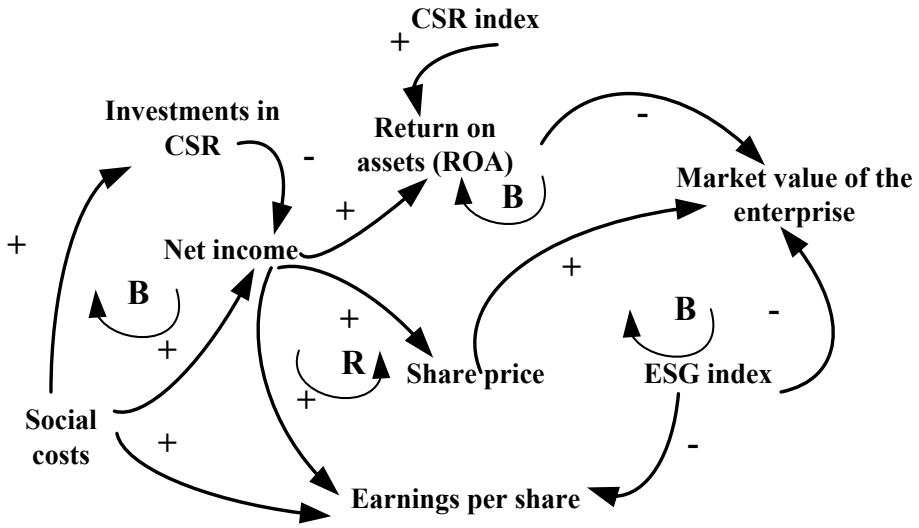

Figure 1: CLD representing CSR-performance relations
Source: Authors' elaboration.

Also, the link between social costs and investements in CSR is marked as positive. So, one can conclude that the loop connecting social costs, investments in CSR, and net income is marked as a negative or balancing loop (B), since social costs positively influence investments in CSR which then negatively affect net income. Positive or reinforcing loop (R) can be identified between net income, earnings per share, share price and market value of the enterprise, while negative, i.e. balancing loop exists between net income, ROA and market value of the enterprise. Also, the negative loop is identified between CSR index, ROA and market value of the enterprise, as

well as between ESG index, the market value of the enterprise, and earnings per share.

5 Discussion and Conclusion

Various researchers come to the conclusion that some CSR activities measured through CSR indicators improve organizational performance. However, previous research is mostly focused on partial, isolated studies of CSR-performance relations. The above indicates the relevant knowledge gap which we tend to overcome with this research. Therefore, a holistic framework representing various CSR-performance relations, mutual CSR indicators relations as well as mutual business performance relations have been introduced. Originality of the research is derived from methodological features and it is reflected in enabling the methodological tool for predicting future CSR performance. The presented systemic framework illustrating feedback loops enables decision-makers to focus on the key decision-making points and predict the future effects of CSR activities on business performance.

Based on these findings, some practical implications can be proposed. First, enterprises should encourage social costs as they stimulate net income, which positively influences ROA, earnings per share, share price, and market value of the enterprise. On the other hand, enterprises should carefully consider investments in CSR as they lead to lower net income. Analogous to that, the ESG index negatively affects the market value of the enterprise and earnings per share.

Taking this into account, the paper's primary contribution is related to methodological support in decision-making about various CSR activities. However, the findings are based on the previous research results, not on our own empirical research results. It can be seen as the key limitation of the paper which can be eliminated in the future research. Still, this framework can be a good base for decision-makers regarding CSR-performance relations.

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SMART EDUCATION FOR CORPORATE SUSTAINABILITY REPORTING

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Abstract "The European Green Deal" (EGD) is an integral part of the EU's strategy to implement the United Nations Agenda 2030. Companies with more than 500 employees are required to include non-financial reporting (NFR) on their operational, social, and environmental data. In 2023, the Corporate Sustainability Reporting Directive (CSRD) extends reporting to all companies over 250 employees and certain SMEs, which will be required to report on nonfinancial aspects of their business since 2024–2028. The number of companies, subject to reporting will quadruple. Managers and responsible employees will have to cope with new challenges. Erasmus+ project Smart Education for Corporate Sustainability Reporting (SECuRe) is filling a gap in VET programmes dealing with knowledge in sustainability reporting, building up a common approach for VET teachers and learners across the EU to respond to the requirements of the future job market. The project started with a knowledge repository, a questionnaire about stakeholder' needs and wishes, and state-of-the-art in reporting. Job profiles and training course with 6 learning units were prepared. An interactive e-learning platform, a gamification approach, and experimental online training will bring the final contents of the course.

Keywords: corporate reporting, e-learning, EU directive, education, sustainability

JEL: I29, M53, Q56

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1 Introduction

The Brundtland Commission defined sustainable development but did not provide guidance on how to implement action (Baumgartner and Rauter, 2017). Many concepts have been developed that address corporate sustainability and consider the triple bottom line (people, planet, profit), including corporate sustainability reporting. However, mainstreaming corporate sustainability, e.g., with the circular economy concept, can lead to different results depending on whether the company selects SDG targets or indicators (Opferkuch et al., 2022).

For this reason, many authors have emphasised the need for alignment of different reporting frameworks (Kücükgül et al., 2022). Mandatory disclosure of information is usually accompanied by an increase in its credibility and a focus on a wide range of stakeholders, not just shareholders (Ioannou and Serafeim, 2017). As a result, companies also tend to disclose more social and environmental information (Madaleno and Vieira, 2020). A need has emerged for companies to communicate their sustainability in corporate reports also in a graphic way with symbols (Bovea et al., 2021). The next step in corporate sustainability reporting is a paradigm shift from standardised disclosures to an understanding of sustainability as a way to stay within the planet's boundaries (Shaer and Hussainey, 2022; Erlandsson et al., 2023). The creation of new job profiles with corresponding competencies can support the implementation of sustainability concepts in the value chain (Walińska and Dobroszek, 2021).

The EU launched the ambitious initiative "The European Green Deal" (EGD) as an integral part of the United Nations Agenda 2030 and its sustainable development goals (SDGs). Reliable, comparable, and verifiable information plays an important part in enabling consumers to make more sustainable decisions and reduces the risk of 'greenwashing'. As a part of the EGD initiatives, large companies are required to report against a standard methodology and to assess their impact on the environment. In current practice, the Non-Financial Reporting Directive (NFRD, EP&CD 2014) lays down the rules on disclosure of non-financial information by companies and is fully transposed in all EU Member States (including partners' countries – Czech Republic, Poland, Romania, Slovenia, Spain). However, as the reporting obligation applies to companies with over 500 employees, only, the proportion of businesses disclosing non-financial information is low. Moreover, several problems were identified, regarding companies' capacity in delivering such

reports; various analyses reveal that in many cases, information is provided at a general level and/or data are incomplete and non-comparable.

In 2022, the EU reached an agreement to replace the NFRD with the Corporate Social Reporting Directive (CSRD) that extends its scope to companies with over 250 employees and certain SMEs that will be required to report on nonfinancial aspects of their business since 2024–2028 (EP&CD, 2022). The number of companies, subject to the mandatory reporting will thus increase from 11 700 to approximately 50 000 (EC, 2023). The managers and responsible employees will have to cope with new challenges.

The project Smart Education for Corporate Sustainability Reporting (SECuRe) is dealing with knowledge in sustainability strategy and reporting and builds up a common approach for vocational education and training (VET) across the EU to respond to the requirements of the future and maintain a flexible job market.

The project started with a knowledge repository, an online database that systematically captures, organizes, and categorizes knowledge-based information, helping learners to connect with information and expertise globally. State-of-the-art reviews in partner countries, and a questionnaire, returned by 77 stakeholders, presenting their needs and wishes. Based on the analysis phase, the SECuRE Manager job profile has been built, aligning the learning outcomes in terms of knowledge, skills and competencies. The training course with 6 learning units was prepared: 1) European legislation and sustainability standards, 2) sustainability management, 3–5) environmental, social, and corporate dimensions, 6) sustainability reporting. An interactive e-learning platform with gamification approach, several multiplier events, a pilot application, experimental online training together with other activities will bring the final contents of the course.

2 Theoretical Background

EU law requires all large companies to disclose information on their risks and opportunities arising from social and environmental issues, and the impacts of their activities on people and the environment. This helps investors, civil society organisations, consumers, and other stakeholders to evaluate the sustainability performance of companies. Under the NFRD, large companies must publish information related to: a) environmental matters, b) social matters and treatment of

employees, c) respect for human rights, d) anti-corruption and bribery, and e) diversity on company boards.

Guidelines on NFR were published by European Commission (EC, 2017, 2019) to help companies disclose environmental and social information. These guidelines are not mandatory, and companies may decide to use international, European, or national guidelines according to their own characteristics or business environment.

On January 2023 the CSRD entered into force. This directive modernises and strengthens the rules about the social and environmental information that companies must report. A broader set of large companies, as well as listed SMEs, will now be required to report on sustainability.

New rules will ensure that investors and other stakeholders have access to the information they need to assess investment risks arising from climate change and other sustainability issues. They will also create a culture of transparency about the impact of companies on people and the environment. Finally, reporting costs will be reduced for companies over the medium to long term by harmonising the information to be provided.

The first companies will have to apply the new rules for the first time in the financial year 2024, for reports published in 2025. Companies subject to the CSRD will have to report according to European Sustainability Reporting Standards (ESRS). The CSRD also makes it mandatory for companies to have an audit of the sustainability information that they report. In addition, it provides for the digitalisation of sustainability information. The rules introduced by the NFRD remain in force until companies must apply the new rules of the CSRD.

The *EU taxonomy* (EC, 2023) is a classification system, establishing a list of environmentally sustainable economic activities. It could play an important role to help the EU scale up sustainable investment and implement the EGD providing companies, investors, and policymakers with appropriate definitions for which economic activities can be considered environmentally sustainable. In this way, it will create security for investors, protect private investors from greenwashing, help companies to become more climate-friendly, mitigate market fragmentation and help to shift investments where they are most needed. The Taxonomy Regulation

establishes 6 environmental objectives: 1) climate change mitigation and 2) adaptation, 3) sustainable use and protection of water and marine resources, 4) transition to a circular economy, 5) pollution prevention and control, and 6) protection and restoration of biodiversity and ecosystems.

3 Methodology

The first part of the methodology consists of literature search which is collected in the Knowledge Repository (KR). It is an online database that systematically captures, organizes, and categorizes knowledge-based information. KR has a user-friendly structure and is included in the web site of the project as an open access, to establish an active link between the project and the users' community.

The second part of methodology includes partners' overviews of the situation in their countries regarding the state-of-the-art in the usage of NFRD, and preparative activities for the CSRD introduction. Stakeholder needs and barriers were collected by applying a questionnaire with at least 15 respondents from each partner country. The developed course will be tested, evaluated, and improved in several consecutive steps: a) 5 multiplier events, one in each country with at least 20 participants, b) joint staff event Train the trainers with 15 participants, c) Course pilot application, and d) Experimental online training – final test with 80 individuals.

4 Results

4.1 State-of-the-art review

Overviews from partner countries indicate that most large companies are publishing annual NFR information, either nationally or as a member of an international group. The following trends in Environmental, Social, and Governance (ESG) reporting have been observed for the companies included in the survey:

- Reporting companies have a clear preference for communicating ESG information via a separate report.
- There is a growing interest in using recognized reporting standards like the Global Reporting Initiative (GRI).

- Only for few reports an opinion is issued by an independent verifier. In most cases, the opinion is of limited assurance and relates to a narrow set of indicators.
- Concerns about climate change are increasing at the local level with targets for reducing greenhouse gas (GHG) emissions. But only a few companies are reporting at the local level on the risks associated with climate change.

The results show that companies are increasingly following the Task Force on Climate-related Financial Disclosure (TCFD) by accepting their recommendations (TCFD, 2022).

4.2 Questionnaire results

To understand the state of knowledge in companies, the needs, and the main barriers of companies, a questionnaire with 37 open and closed questions was sent to stakeholders in each partner country. 77 of them responded. Most of them were managers or experts on sustainability issues from large companies and SMEs. The environmental dimension and sustainability management are the most frequently reported issues, while the social and governance dimensions are less frequently reported. 52 % of the companies are not familiar with the CSRD guidelines. Customers are the most important stakeholder, followed by company owners, stakeholders, investors, or banks. 43 % of companies are not required to report non-financial data, and 55 % of them do not have a person responsible for sustainability reporting. The most important constrains in corporate sustainability reporting are missing knowledge (30 %), and lack of data (25 %).

4.3 Training course contents

The course is addressing the area of VET, and combines academic perspective with hands-on practical work, giving the participants the knowledge, skills and experience they need to develop a career in sustainability and specifically in being able to develop sustainability management and reporting services. The training content is designed to give participants the opportunity to develop clear alternatives for professional organizations to secure a sustainable future in economic, environmental, and social terms.

Six learning units are being developed. Each one starts with expected learning outcomes – knowledge, skills, and competences. The learning outcomes are structured in accordance with the standards outlined in the European Qualifications Framework, EQF and the European credit system for vocational education and training, ECVET. Each learning unit has a value of 5 ECTS (European Credit Transfer and Accumulation System).

The four main topics of the course are including:

1) *Sustainability management* (characteristics, strategy, business models). Sustainability and environmental protection are already at the foreground of economic and political debate, after spending decades on the periphery of public and corporate concerns. The capabilities to complete sustainability is increasingly regarded as a sign of a well-managed organization. As the private sector shifts toward more sustainable practices, we are getting closer to reaching a critical mass that can have a significant impact on the global economy. Sustainability management can also be defined as economic production and consumption that reduces environmental impact while increasing resource conservation and reuse.
2) *Environmental dimension* (use of resources, pollution, climate change). Companies are expected to provide detailed information on their environmental policies, strategies, targets, and performance, as well as risks and opportunities related to environmental issues. The environmental dimension of ESG reporting is becoming increasingly important as businesses and investors recognize the importance of sustainability and the need to mitigate the impact of human activities on the planet. The learning unit introduces basic knowledge regarding natural capital and its actual status, how to manage natural resources and biodiversity and why it is important; what are the key elements of climate change, its risks, and opportunities, how business can assess their emissions, and plan for climate change mitigation and adaptation. Further, the overall business impact on the environment is presented by using specific indicators. Finally, the unit presents the key requirements of environmental reporting and how to assess the overall environmental performance.
3) *Social dimension* (diversity and equality, consumer protection, human rights). Human rights, cultural and other fundamental rights and freedoms represent a substantial part of SDGs as well as the European Social Charter and future

EU sustainability legislation. Business enterprises can profoundly impact the human rights of employees, consumers, and communities wherever they operate. These impacts may be positive, such as increasing access to employment or improving public services, or negative, such as polluting the environment, underpaying workers, discriminating gender, racial or social groups, or forcibly evicting communities.

4) *Corporate governance dimension* (management structure, employee relations). It refers to the relations between the company's management, its board, shareholders and broader stakeholders, as well as the way in which the company's goals are achieved, the structure of its bodies and the guiding principles (internal policies) directing all of its operations – from compensation, risk management, and employee treatment to financial results, reporting, and dealing with impact on the climate, environment, human rights, etc. Corporate governance that calls for upstanding and transparent company behaviour leads a company to make ethical decisions that benefit all its stakeholders.

5 Discussion and conclusion

Step-by-step guide on how to integrate sustainability in a company outlines the key components, objectives, and goals of an effective and efficient reporting system focused on sustainability. The goal of such a guide for a sustainable reporting system is to provide a roadmap for companies to enhance their sustainability reporting, improve the transparency and credibility of their sustainability practices, and to create a more sustainable future for all.

Sustainability reporting is the essential aspect of corporate responsibility and sustainable development. It enables companies to identify and manage risks and opportunities, build trust and reputation, align with the SDGs, and contribute to sustainable development. As the demand for sustainable products and services continues to grow, companies that report on their sustainability performance will be better positioned to meet the needs of their stakeholders and succeed in the long-term.

Standardization and digitalization of data ensure that it is accurate, consistent, and reliable. Standardization helps to establish a common set of rules and guidelines for collecting, storing, and reporting data, while digitalization improves the efficiency

and effectiveness of data management. However, digitalization also has its own set of challenges, such as ensuring the security of the data and the significant investment in technology, personnel, and processes.

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CONTRIBUTION OF INDUSTRY 4.0 TO SUSTAINABLE DEVELOPMENT

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Abstract The main purpose of this paper is to discuss how implementation of Industry 4.0 principles in organizations contributes to sustainable development. Based on desk research of literature, several contributions of Industry 4.0 to sustainable development are outlined. We discussed the issue of monitoring of Industry 4.0 contributions to sustainable development in the context of existing models for assessing Industry 4.0 implementation level. The paper provides fertile ground for further examination in this field and development of relevant model for assessment Industry 4.0 implementation level, while also considering Industry 4.0 contribution to sustainable development.

Keywords: Industry 4.0, sustainable development, maturity assessment models, SDG-17, models for assessment

JEL: L21, L30, L60, M14

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1 Introduction

The importance of social responsibility in organizations has grown significantly in recent years (Potocan & Nedelko, 2021). In the last period, there has been a lot of talk about sustainable development, which can be supported by implementing the principles of Industry 4.0 in organizations (Ching et al., 2022; Sierra-Henao et al., 2020).

The central purpose of sustainable development phenomena is to establish such a way of functioning of individuals and all entities in society, with special emphasis on organizations, which will enable a decent life for the generations that come after us (Elkington, 2004).

The principles of Industry 4.0 have been intensively implemented in organizations in the last decade, mainly with the aim of improving productivity, operations in general, reducing costs, automating operations, and gaining other advantages (Črešnar et al., 2022; Dabić et al., 2023). Naturally, there is a strong tendency towards research that would connect the concepts of sustainable development and Industry 4.0 (Sierra-Henao et al., 2020).

In this context, there are sporadic studies that mainly represent the expected contributions of Industry 4.0 to sustainable development (Ching et al., 2022; Mukhuty et al., 2022; Varela et al., 2019). But, despite the increased interest from researchers on examining the impact of Industry 4.0 on sustainable development (Ghobakhloo et al., 2021; Khan et al., 2021), relatively little is still known about how these benefits can be measured and monitored in practice.

We will emphasize several benefits how implementation of the Industry 4.0 principles in organizations can contribute to sustainable development. We will further discuss how we can measure the level of contribution of the implementation of the principles of Industry 4.0 to sustainable development, within the framework of known models for evaluating the level of implementation of Industry 4.0 in organizations. We will provide some starting points for further work and model development.

2 Literature Review

Digitalization has become an important part of the daily operations of organizations in the last decade. In the beginning, the researchers paid attention mainly to the development of the concept of Industry 4.0 (Zhou et al., 2015), which was followed by a large share of research that examined the effects of the implementation of the Industry 4.0 concept in the practice of the organizations. For example, through case studies (Otles & Sakalli, 2019) and in connection with lean and six sigma concepts (Wagner et al., 2017; Yeen Gavin Lai et al., 2019).

Industry 4.0 for organizations brings productivity improvement, cost reduction, energy consumption reduction, etc. At the beginning, the implementation of the principles of Industry 4.0 was mainly in the manufacturing sector (Tortorella & Fettermann, 2018), but later the implementation also started in the service sector, as well in public administration (Ghobakhloo et al., 2021). The monitoring of changes in productivity due to the implementation of Industry 4.0 principles was often highlighted (Dabić et al., 2023; Fragapane et al., 2022; Tortorella & Fettermann, 2018).

Due to the emergence of new challenges related to the implementation of Industry 4.0 in organizations, researchers began to point out the importance and relevance of soft factors in the implementation of Industry 4.0 in the organization (Črešnar et al., 2022; Schneider, 2018). One such challenge is the contribution of Industry 4.0 to sustainable development.

Sustainable development is a key concept in the framework of ensuring the welfare of society and its members. Concern for sustainable development or the socially responsible operations of the organization is today strongly articulated in various documents, whereby it is the most exposed in recent times United Nations 2030 Agenda for Sustainable Development Goals (SDGs -17). This agenda allow us to judge how much the organization contributes to sustainable development (Mukhuty et al., 2022).

There are few sporadic attempts that outline the association between the implementation of Industry 4.0 and its effects and contribution to sustainable development (Ching et al., 2022; Ghobakhloo et al., 2021; Khan et al., 2021).

In order to make implementation easier and to know the state of the organization's digitalization level, many models for assessing the level of Industry 4.0 implementation have been developed. These models reveal to us the dimensions of digitalization of organizations through various aspects. For instance, commonly used are models developed by Fraunhofer institute and University of Warwick (Agca et al., 2017; Črešnar et al., 2022). We also know the model, where management tools are used in the assessment of Industry 4.0 implementation level (Črešnar et al., 2020).

Seen through the prism of assessing the level of Industry 4.0 implementation in organizations, the most frequently used models do not directly and to a lesser extent indirectly include items related to the sustainable development. For instance, we can find in those models increased productivity, lead times, real-time tracking, etc.

After reviewing the existing models for assessing the level of implementation of Industry 4.0, it soon becomes clear that the existing models do not contain or to a very small extent, items that would enable us comprehensive assessment of the contribution of Industry 4.0 to sustainable development, within the framework of assessments of the level of implementation of Industry 4.0 in organizations.

Therefore, in the following section, we will present a series of contributions of Industry 4.0 to sustainable development, which will represent items to complement the existing assessment models.

3 Industry 4.0 and its Contribution to Sustainable Development

Industry 4.0 can contribute to sustainable development in several ways:

1. Increased efficiency and productivity: Industry 4.0 technologies, such as Internet of Things (IoT), artificial intelligence (AI), and big data analytics, can enhance the efficiency and productivity of manufacturing processes, reducing the amount of energy and raw materials required to produce goods.

2. Reduced waste: Smart manufacturing processes enabled by Industry 4.0 technologies can reduce waste by optimizing material usage, minimizing rejected products, and decreasing the consumption of energy and water.

3. Improved traceability and transparency: Industry 4.0 technologies can enable greater traceability and transparency in supply chains, empowering consumers and stakeholders to make informed decisions about sustainable products and ethical sourcing.

4. Lower carbon footprint: Smart factories enabled by Industry 4.0 technologies can reduce their carbon footprint through the use of renewable energy sources, energy-efficient equipment, and reduced energy consumption.

5. Support for circular economy: Industry 4.0 technologies can support the shift towards a circular economy by enabling more efficient and effective resource management, recycling, and repurposing of materials.

6. Innovation in sustainable products: Industry 4.0 can foster innovation in sustainable products by providing new design and production capabilities enabled by digital technologies, such as additive manufacturing and virtual prototyping.

7. Sustainable supply chain management: Industry 4.0 technologies can enable better supply chain management, reducing transportation emissions, optimizing logistics and reducing waste along the supply chain.

8. Improved water management: Industry 4.0 technologies can help monitor and manage water consumption in factories and identify opportunities for reduction or reuse of water, contributing to sustainable water management.

9. Safety and health benefits: Industry 4.0 technologies can improve worker safety and health through the use of automated processes, wearable devices, and virtual training, reducing workplace accidents and injuries.

10. Social responsibility: Industry 4.0 technologies can enhance social responsibility by promoting ethical and sustainable practices in production, increasing transparency and accountability, and improving working conditions for employees.

4 Discussion and Conclusions

It can be concluded that there is an extremely large amount of literature on the topic of sustainable development, which has been intensively developed in the last two or three decades. But the connection between the implementation of Industry 4.0 and sustainable development is still weak. Even more, models for assessing the level of Industry 4.0 implementation do not include items that would enable a comprehensive assessment of Industry 4.0 implementation, while also taking into the consideration the sustainable development dimension. However, we can find a lot of indirect links where, based on the assessment of individual criteria regarding implementation of Industry 4.0, we can decide what the contribution could be or impact on sustainable operations. But this is not enough for a comprehensive evaluation of the contribution of Industry 4.0 to sustainable development.

The listed contributions of Industry 4.0 to sustainable development are thus a starting point for creating criteria for assessment (e.g. KPI) of the impact of Industry 4.0 on sustainable development. The existing models for assessing the level of implementation of Industry 4.0 principles would thus need to be complemented with the items measuring "sustainable development". This would give us a more comprehensive picture of the level of implementation of Industry 4.0, while also considering sustainable development goals of the society.

One of the most important directions of further research will be the development of a comprehensive model for assessing the level of implementation of Industry 4.0, which will also include items that will enable the assessment of the level of contribution of Industry 4.0 to the sustainable functioning of organizations.

The central limitation of this paper stems from a purely theoretical study of the contribution of Industry 4.0 to the achievement of sustainability goals.

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7TH FEB INTERNATIONAL SCIENTIFIC CONFERENCE: STRENGTHENING RESILIENCE BY SUSTAINABLE ECONOMY AND BUSINESS – TOWARDS THE SDGS

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Abstract Sustainability is an increasingly important mechanism for the resilience and competitiveness of economies and businesses in a dynamic and unpredictable global environment. The SDGs guide the implementation of sustainability in many areas of the social, economic and environmental activities of individuals, organizations and societies. The recent global health crisis, climate change and international geopolitical turmoil increases the importance of sustainability for societies and organizations and make it imperative to transform corporate business models towards sustainability. These developments are triggering changes in harmful socio-economic trends and the determinants of global competitiveness of economies and businesses. The contributions of these Proceedings address the current economic and business challenges facing countries and businesses in the era of the new development paradigm, and cut across all fields of economics and business sciences.

Keywords: sustainability, resilience, competitiveness, global environment, SDGs

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