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THE IMPACT OF PRODUCT INNOVATION ON FEMALE ENTREPRENEURSHIP SUCCESS: A CASE OF SAUDI ARABIA

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***Abstract:** Recent reforms in Saudi Arabia granted empowerment to women, opening new entrepreneurial avenues for them. This study aims to assess the influence of product innovation on the success of female entrepreneurs in Saudi Arabia. Employing a quantitative approach, data was collected through a survey questionnaire. The primary data set included responses from 256 Saudi female entrepreneurs. SmartPLS was utilized for analysis, employing the PLS-SEM statistical technique. The results revealed a positive overall effect of product innovation on female entrepreneurs and their intentions. The study offers practical insights for female entrepreneurs and the Saudi government to address challenges faced by Saudi women. Recommendations include the formulation of policies that provide sustained support for women entrepreneurs. Additionally, the study suggests potential avenues for future research in this domain.*

***Keywords:** Product Innovation, Innovation Creed, Innovation Conviction, Innovation Mindset, Female Entrepreneurship, Saudi Arabia*

INTRODUCTION

In the current business environment, the entrepreneurial population of female ventures is growing rapidly, which holds huge potential for making a major contribution towards wealth creation, innovation, and employment generation around the world (Demartini, 2018). Innovative businesses have created prominent opportunities for female entrepreneurs to enhance their competitiveness. Because trends in female entrepreneurship are growing around the world, the representation of female entrepreneurs is still quite low in comparison with male entrepreneurs. As mentioned in the study of Al-Kwafi et al. (2020), the unequal status of women compared to men in most developing countries is a major factor that restricts women from carrying out their entrepreneurial activities. Particularly in the context of the Middle Eastern region, unequal status for women is regarded as one of the major challenges to women's entrepreneurship. However, most countries have now recognized the important role of women entrepreneurs in economic well-being, so they are making efforts to harness equality and open up the opportunity for women to practice their entrepreneurial activities (Ahmad & Bajwa, 2022; Ahmad & Bajwa, 2021).

Saudi Arabia is one of the countries recently acknowledging the importance of prioritizing entrepreneurship and encouraging women's involvement in these endeavors to realize economic prosperity and growth (Bereczki, 2015; Danish & Smith, 2012). Female entrepreneurs, similar to their male counterparts, are now considered catalysts for innovation

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and job creation. The government's efforts to transform women's status in society by creating different opportunities for them (Welsh et al., 2014). However, despite different reforms and initiatives from the KSA government, women entrepreneurs are still faced with an apparent form of discrimination when taking part in entrepreneurial activities. According to (Bulsara et al., 2014), innovation works as an instrument or catalyst for entrepreneurship to achieve its main goals; thus, an effective entrepreneurial society requires continuous and steady development of innovation and entrepreneurship. Similarly, Peter Ducker, one of the most prominent authors and educators of management studies, has stated that innovation is a particular feature of entrepreneurship, that bestows resources with a new capacity to generate wealth (Agarwal, 2019). As per (Dastourian et al., 2017), in the evolution from an industrial society to a knowledge and information society, the component of innovation and product development plays a crucial role in providing a distinctive advantage to entrepreneurs. While innovation positively influences different entrepreneurial activities, it eases up the attainment of resources, and the appropriate application of new knowledge and ideas tends to reduce risk, improve learning levels, and simplify different entrepreneurial activities.

Though research investigating the impact of product development on entrepreneurship in general is ample (Lee et al., 2016; Nambisan et al., 2018; Ressin, 2022), evidence of the impact of product innovation on women's entrepreneurship is scarce. Women's empowerment remained one of the understudied research areas in Saudi Arabia. Recent reforms empowering Saudi women across diversified domains, it attracted researchers' attention in recent years (Alotaibi, 2020). However, women's entrepreneurship is a relatively less explored area. Particularly, its relationship with product innovation and how it is influenced by that is almost unexplored in Saudi Arabia. Though evidence from other geographical contexts has generally provided a positive relationship, both variables have been studied from different perspectives, as discussed in the literature review. By addressing prevailing gaps, this study aims to contribute to the body of knowledge in the following ways:

Firstly, while previous studies mainly focused on product development, this research shifts the focus to product innovation. product innovation has been conceptualized with three dimensions: innovation convention, innovation mindset, and innovation creed.

Secondly, current studies investigate the role of product innovation in entrepreneurship in general, whereas this study primarily focuses on female entrepreneurship. Female entrepreneurship is conceived with three dimensions: perseverance, a need for achievement, and risk-taking behavior.

Thirdly, this study provides empirical evidence of women's entrepreneurship from Saudi Arabia, where women have recently been empowered. Therefore, the body of knowledge on this novel area is very limited.

Lastly, this study contributes to the global body of knowledge with relatively novel insights on how innovation conventions, innovation creeds, and innovation mindsets can lead women to entrepreneurial success. The expected findings hold important implications for Saudi female entrepreneurs, the government, society, and future researchers, as discussed in the end.

LITERATURE REVIEW

Entrepreneurship and Female Entrepreneurs' Success

The term 'entrepreneurship' refers to the process of establishing a new business venture by bearing all risks associated with it to generate a substantial profit (Ramadani et al., 2015; Syed et al., 2019). Radovic-Markovic and Salamzadeh (2012) defined entrepreneurship as the process of creating new value by entrepreneurs through the investment of their financial resources, time, and efforts to attain greater monetary profits and success in the corporate sector. However, due to the lack of a universal definition of entrepreneurship, numerous definitions highlight the different perspectives (Burns, 2016; Drucker, 2014).

However, a successful entrepreneur needs analytical thinking, expertise, creativity, and competitiveness that enable the individual to take the lead in the market regardless of their gender, identity, and background (Goby & Erogul, 2011; Terjesen & Lloyd, 2015). In the current era, the world is moving towards modernization, where males and females are at an equal pace with each other to attain success and take the lead in a professional environment. In this regard, female entrepreneurs are those women who intend to and possess the potential to start their business venture either based on innovation (Danish & Smith, 2012). According to Arab News (2017), there were 37% of female entrepreneurs in Saudi Arabia in 2017, compared to 35% in 2016.

Female entrepreneurship success refers to the ability of a woman to successfully initiate and manage an entrepreneurial startup that shows financial resilience, survives, and sustains in the long run. A successful female entrepreneur possesses a clear vision for the business and the resilience to overcome obstacles along the way. They exhibit perseverance to pursue their goals despite facing gender biases and systemic barriers in society. In addition, they are high-risk takers and possess a higher need for achievement. These components are elaborated on in the following sections.

Perseverance

The term perseverance refers to the phenomenon of the persistence of an individual to achieve a certain goal by remaining adhered to the plan (Manzanera-Román & Brändle, 2016). Noguera et al. (2015) stated that perseverance plays an imperative role in successful entrepreneurship because it motivates individuals to keep trying and remain focused on goals by overcoming all the obstacles that stand in their way. In the competitive era, being a successful business leader in a dynamic market is highly difficult, and most people tend to give up in the initial stage without striving further for success (Radovic-Markovic & Salamzadeh, 2012). For female entrepreneurs, perseverance is important because social obstacles and a lack of support greatly hinder their journey to becoming successful entrepreneurs. Al-Kwafi et al. (2020) implied that the culture of the Kingdom of Saudi Arabia (KSA) specifies that females of the country should head towards running the business and refrain from communicating with the opposite gender due to societal, religious, and cultural norms. Similarly, Meyer and Mostert (2016) asserted that the structure of society and the male dominance concept confine females to the home and create a barrier for women who intend to work professionally.

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Need for Achievement

The concept of a need for achievement is defined as the inner desire and source of motivation of the individual to achieve excellence and take the lead in a competitive environment. Tanveer et al. (2013) asserted that the need for achievement can be considered the motivating factor for entrepreneurs that urges them to stand firm against all barriers and fill the market void. However, Poggesi et al. (2016) argued that the need for achievement reflects the competitive behavior of an individual that motivates them to move in a smooth forward direction. McClelland's need for achievement theory states that a person motivated by a high achievement orientation does not get easily influenced by monetary benefits or other external factors (Khurana & JOSHI, 2017). Similarly, Lai et al. (2010) advocated the need for achievement as the principle of motivation and consistency in attaining success. The phenomenon of the need for achievement can be different for both male and female entrepreneurs, depending on their requirements (Barba-Sanchez & Atienza-Sahuquillo, 2011). Furthermore, for female entrepreneurs, the need for achievement can be related to competing with the main players in the market at an equal level, standing strong in a dynamic environment, and making an impact on different segments of the state's economy (Popescu et al., 2015).

Risk-Taking Behaviour

In entrepreneurship, risk and uncertainties are major factors that are directly associated with the new business idea or venture because competition and a dynamic environment can impact the particular business negatively or positively (Yordanova & Alexandrova-Boshnakova, 2011). It is essential for entrepreneurs to always prepare themselves to bear any sort of risk in newly established businesses because, without taking the risk, they cannot accelerate in a forward direction (Bolton & Lane, 2012). Eroglu and Picak (2011) defined risk as the attribute that can cause loss or failure in certain ventures and drag the organization into crises. Makhbul and Hasun (2011) implied that it is evident that where the rate of profits and success is greater, the number of risks associated with it is also high. The risk-taking behavior reflects the potential, willingness, and persistence of entrepreneurs to achieve new heights and set unique milestones (Sánchez, 2011). According to Makhbul and Hasun (2011), the risk-taking behavior of female entrepreneurs depends on their general attitude, and they depend on a substantial amount of strategic planning before adopting any risk associated with their business venture.

Product Innovation

The term innovation has multiple definitions and concepts that vary according to the perception and knowledge of every individual (Bucherer et al., 2012). De Medeiros et al. (2014) defined innovation by highlighting that it is the process of presenting a new creative idea regarding the establishment of certain products or services that can help create a competitive advantage and a firm position. Furthermore, Evanschitzky et al. (2012) advocated that innovative ideas can help fill the void in the market and can be generated from experience, problem-solving skills, and the creative thinking process. However, Hughes et al. (2012) advocated the concept of innovation by stating that it involves making new changes and incorporating creativity into existing products or services. product innovation refers to the development and establishment of a product by introducing a product that does not exist in the

market already or possesses some creative feature that adds to the uniqueness of the product and encourages the consumers to purchase that certain product (Berends et al., 2014; Galanaki & Papalexandris, 2017; Zivanovic et al., 2023). In a complex business environment, innovation helps entrepreneurs compete with key players in the market, establish their position, and effectively attract consumers' attention toward new ventures (Lai et al., 2010). However, the likelihood of failure of a certain innovative product is always high because of the resistance of the target audience to new changes (Slater et al., 2014).

Innovation Conviction

The term innovation conviction (ICN) refers to the attitude towards commitments and achieving a certain goal (Lai et al., 2010). Every entrepreneur tends to establish their business venture with some mission and vision statement they intend to address in the future (Waychal et al., 2011). However, over time, the goals do not align with the actual practices and activities of the organization. Some entrepreneurs lack the ability to deliver specified commitments due to the absence of determination and motivation (McAdam et al., 2014). Conviction is necessary to transform the innovative idea into a real-world entity, and it keeps the entrepreneurs motivated toward their goal of achieving success through an innovative idea (Romero & Martínez-Román, 2012). Motivation and determination are two major components that act as the driving source for innovation conviction because the sole attitude of the entrepreneur toward innovation cannot bring success if motivation is absent (Waychal et al., 2011). Furthermore, a lack of innovation conviction among entrepreneurs also affects the behavior of their employees in the workplace, because when they experience the non-alignment of the mission statement of the organization and business activities, negative perceptions are created for their employer (Popescu et al., 2015).

Innovation Mindset

The innovation mindset (IMT) reflects the attitude and approach of entrepreneurs towards innovation and new business ventures. In general, there are two different types of people: first, they always seek to follow the conventional pursuit and refrain from innovation (Abu-Saifan, 2012; Lai et al., 2010). Whereas, some individuals are flexible towards new changes and innovation. (Gundogdu, 2012) advocated that for the success of an organization that follows the innovation pursuit, its employees must possess a positive mindset and be flexible enough to embrace it.

Similarly, (Secundo et al., 2015) claimed that if entrepreneurs manage to change the attitude of the employees towards the adoption of innovation in a positive way, then they are quite close to success because, in dynamic and competitive environments, creativity and uniqueness can help them to accelerate smoothly. However, Israel and Johnmark (2014) specified that strategic changes and uniqueness in product or service characteristics are required to encourage and motivate employees towards innovation in a positive manner. If entrepreneurs tend to follow conventional pursuits from scratch and intend to transform them into an innovation mindset, suddenly they might need to face resistance from their employees (Durkin & Gunn, 2016).

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Innovation Creed

The phenomenon of innovation creed (ICD) is closely related to the concept of innovation conviction because ICD reflects the beliefs of entrepreneurs that are derived from their attitudes (Lai et al., 2010). If entrepreneurs possess a strong belief in their innovative ideas, it would work as a source of motivation for them to pursue and transform their innovative ideas into a successful reality (Schaltegger & Wagner, 2011). Rettberg (2016) asserted that personal beliefs can help entrepreneurs withstand their innovation convictions firmly and struggle to achieve success through continuous motivation. The study accumulated by Evanschitzky et al. (2012) highlighted that a lack of belief and confidence in an innovative idea can demotivate entrepreneurs to step back due to uncertainties and a lack of motivation.

Impact of Product Innovation on the Success of Female Entrepreneurship

Entrepreneurs do not solely depend on innovation to seek opportunities and achieve success; sometimes innovation is derived from the need for a certain product or service in the market (Brush & Cooper, 2012). Innovation is a significant prospect for successful entrepreneurship. The phenomenon of successful entrepreneurship can be different for both males and females because obstacles and barriers in their way of success are also different, which leads to a difference in attitude, mindset, and belief of the individual towards innovation (Noguera et al., 2015). For female entrepreneurs, cultural, financial, and societal pressures are major barriers that hinder their way of attaining success, specifically in Middle Eastern countries such as KSA (Danish & Smith, 2012). According to the study accumulated by Al-Kwafi et al. (2020), in KSA, despite the numerous initiatives of the government, female entrepreneurs have to face strong setbacks and discrimination when they struggle to contribute to the economic development of the country. However, innovation conviction, which is their firm belief in their innovative idea, and a positive attitude can help them remain motivated towards the achievement of success (Valdivia, 2015). Subsequently, the study assembled by (Lai et al., 2010) asserted that for women entrepreneurs, continuous motivation is necessary to remain intact with their goal and lessen the influence of external pressure on them. This discussion led us to the following hypotheses:

H1: Innovation conviction positively impacts female entrepreneurship success.

H1a: Innovation conviction positively impacts the need for achievement.

H1b: Innovation conviction positively impacts perseverance.

H1c: Innovation conviction positively impacts risk-taking behavior.

H2: Innovation mindset positively impacts female entrepreneurship success.

H2a: Innovation mindset positively impacts the need for achievement.

H2b: Innovation mindset positively impacts perseverance.

H2c: Innovation mindset positively impacts risk-taking behavior.

H3: Innovation creed positively impacts female entrepreneurship success.

H3a: Innovation creed positively impacts the need for achievement.

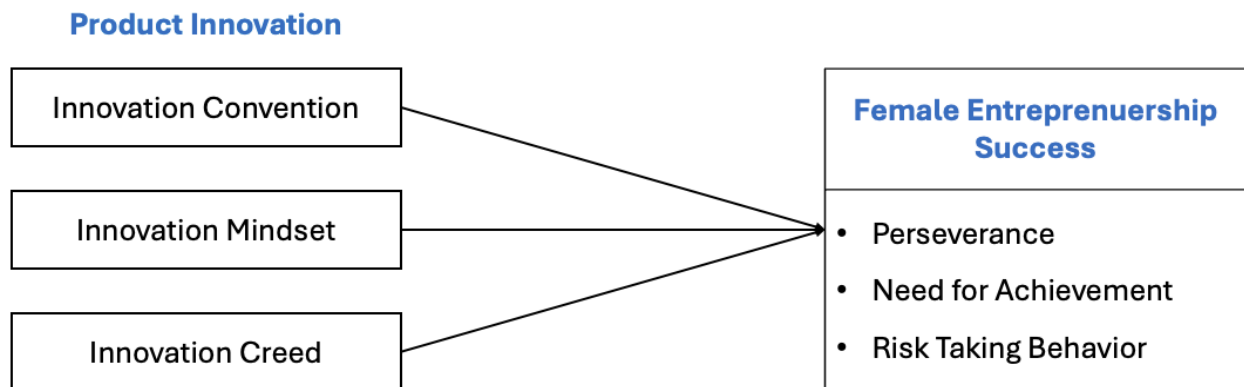
H3b: Innovation creed positively impacts perseverance.

H3c: Innovation creed positively impacts risk-taking behavior.

Based on these hypotheses, the conceptual framework of the study is presented in Figure 1. The framework highlights innovation conviction, innovation mindset, and innovation creed (three facets of product innovation) as independent variables that positively influence

female entrepreneurship success. Female entrepreneurship success is a dependent variable with three dimensions: perseverance, the need for achievement, and risk-taking behavior.

Figure 1
Conceptual framework of the study



METHODS

The population of this study includes women entrepreneurs in Saudi Arabia, as the study aims to examine the role of product innovation in women's entrepreneurship success. An exclusive list of women entrepreneurs' population is not available. To determine the minimum sample size, we followed the 10:1 rule proposed by [Hair et al. \(2021\)](#), where ten responses are required for each indicator. The questionnaire includes 24 indicators, thus requiring a minimum sample size of 240.

Since the exact population size is not known, this study employed the snowball sampling technique to reach out to the desired respondents from across Saudi Arabia. The authors initially sent the online survey link through personal contacts to female entrepreneurs and requested them to snowball it to their contacts. A total of 489 responses were received. However, 233 responses were incomplete or unengaged, which were dropped from the analysis. A total of 256 complete responses were considered for final data analysis, yielding a 52% response rate. The majority of the female entrepreneurs (44%) were aged between 26 and 40 years, followed by around 28% between 41 and 55 years. 64% of the entrepreneurs had a graduate degree, followed by secondary education (17%), and a minor percentage (1%) had no formal education, while 10 percent had a master's or higher degree.

The survey questionnaire was designed with due care and following the guidelines outlined by [Saunders et al. \(2016\)](#). It was structured to gather data for the six latent constructs of this study using Likert scales, alongside collecting anonymous demographic details. Respondents' responses were collected using a 5-point Likert scale, with 1 representing strong disagreement and 5 representing strong agreement.

To operationalize the study variables, we utilized pre-validated measurement instruments for product innovation from [Lai et al. \(2010\)](#), and for women entrepreneurship success from [Gupta and Mirchandani \(2018\)](#) and [Abd Rani and Hashim \(2015\)](#). To ensure the suitability of these measurement scales for this study, reliability was ensured through confirmatory factor analysis and Cronbach's alpha. Additionally, the scales underwent testing

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for convergent and discriminant validities, as well as face and content validity with input from three experts.

The final data was analyzed using SmartPLS 4 statistical software, employing a partial least squares (PLS) approach of structural equation modeling (SEM). This approach was mainly used due to non-normal data distribution and reflective nature of study constructs, as used by other similar recent studies such as [Bajwa et al. \(2023\)](#), [Mahmood et al. \(2022\)](#), and [Ahmad and Iqbal \(2022\)](#). Following [Hair et al. \(2021\)](#) guidelines, the analysis was conducted in two stages: the first stage involved assessing the validity and reliability of the latent variables, while the second stage focused on evaluating the structural model to test the research hypotheses.

RESULTS

Measurement Model Specifications

The foremost prerequisite for the primary quantitative investigation is to assess the reliability of the designed instrument. In general, reliability is used to evaluate internal consistency in the responses that are measured through instruments; specifically, when the construct produces consistent results, this implies that the instrument is accurately designed and is reliable to be used for survey questionnaires. Similarly, a second important prerequisite for the analysis is the validity of the construct; the validity of the construct refers to the extent to which an instrument measures what it was intended (planned) to measure. To assess the reliability of the scales, [Hair et al. \(2021\)](#) recommended factor loading scores above 0.60 and Cronbach's alpha values above 0.60.

As shown in Table 1, factor loadings for all the items of the latent variables are greater than 0.60, which has been used as a rule of thumb to accept the factor into the SEM modeling. Any items loaded below the 0.60 threshold were excluded from the analysis. For instance, one item for perseverance had a value of 0.249; hence, it was dropped from the final dataset. For the acceptable value of Cronbach's alpha and composite reliability, scholars recommend a value greater than 0.60 and 0.70, respectively. As the value of all six constructs for Cronbach's alpha and composite reliability exceeded the threshold, there is enough empirical evidence to claim that measurement instruments for all latent variables are reliable.

Table 1
Reliability and validity results

	Factor Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Innovation Creed		0.835	0.892	0.677
ICD1	0.650			
ICD2	0.864			
ICD3	0.844			
ICD4	0.767			
Innovation Conviction		0.790	0.865	0.617
Icon1	0.884			
Icon2	0.895			

ICon3	0.858			
ICon4	0.624			
Innovation Mindset		0.766	0.852	0.592
IM1	0.649			
IM2	0.803			
IM3	0.845			
IM4	0.766			
Need for Achievement		0.864	0.908	0.712
NA1	0.833			
NA2	0.877			
NA3	0.908			
NA4	0.750			
Perseverance		0.707	0.831	0.585
P1	0.863			
P2	0.906			
P3	0.249 (Dropped)			
P4	0.843			
Risk-Taking Behavior		0.846	0.895	0.682
RTB1	0.753			
RTB2	0.839			
RTB3	0.866			
RTB4	0.841			

To assess the convergent validity of the measurement scales, scholars have suggested three conditions: 1) the average extracted variance (AVE) value should be greater than 0.5, 2) CR values should be greater than 0.7, and 3) the CR value should be greater than the AVE value. As shown in Table 1, all AVE and CR values significantly exceeded their respective thresholds, and all CR values were greater than their corresponding AVE values. Hence, it is evident that the instrument measures what it is designed to measure.

Discriminant validity, on the other hand, ensures that the measures that are theoretically expected to be unrelated are indeed not strongly correlated. There exist several methods to assess the discriminant validity of the scales. While Fornell and Larcker (1981) and cross-loading have been the traditional methods to ensure discriminant value, the Heterotrait-Monotrait (HTMT) ratio of correlations is the most recent, stringent, and recommended method. As per Henseler et al. (2015), the value of HTMT should be less than 0.9 to confirm that the two measures are distinct conceptually. As presented in Table 2 the HTMT ratio between the constructs is less than the threshold of 0.9; thus, it can be claimed that there is discriminant validity and that the constructs being used in the paper measure different concepts and are unrelated as well.

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Table 2
Discriminant validity by HTMT ratio

	Innovation Conviction	Innovation Creed	Innovation Mindset	Need for Achievement	Perseverance
Innovation Conviction					
Innovation Creed	0.587				
Innovation Mindset	0.812	0.722			
Need for Achievement	0.494	0.471	0.559		
Perseverance	0.695	0.515	0.795	0.691	
Risk-Taking Behaviour	0.808	0.613	0.706	0.687	0.856

Structural Model Specifications

In structural equation modeling (SEM) the explanatory power of the model is discussed to evaluate the extent to which the observed variable is being explained by the regressors of the model. For this purpose, the coefficient of determination (R-squared) for each observed value is used to assess the explanatory power of the model (Sarstedt et al., 2017). This study has only one dependent variable i.e. Women entrepreneurship success which is a higher-order construct with three dimensions including the need for achievement, perseverance, and risk-taking behavior. However, in this study, it has been examined in first order with the independent variables. Table 3 illustrates the specifications of the revised model after dropping one factor from perseverance.

Table 3
Model specifications

Dependent Variables	R Square	R-Square Adjusted
Need for Achievement	0.262	0.253
Perseverance	0.365	0.358
Risk-Taking Behavior	0.547	0.542

Therefore, the three observed variables are the need for achievement, perseverance, and risk-taking behavior and have R-squares of 0.262, 0.365, and 0.547, respectively. As shown in Figure 2, it is found that the regressors of the model, which include innovation conviction, innovation creed, and innovation mindset, can explain 26.2% of the variability of the need for achievement, 36.5% of the variability of perseverance, and 54.7% of the variability of risk-taking behavior, respectively. It infers that there is residual in the model, and residual is explanatory power that has not been explained by regressors, and residual can only be estimated and explained by variables that are not included in the model. Thus, the inclusion of the other variables in the model could explain the residual variable and further strengthen the model. Meanwhile, it can also be interpreted that other regressors could be used to predict the need for achievement, perseverance, and risk-taking behavior among the women entrepreneurs in Saudi Arabia.

Table 4 provides the results of hypotheses testing using path coefficient (β). The table infers that if there is one unit of positive variation in the innovation conviction, then it will

affect the need for achievement, perseverance, and risk-taking by 0.181 [$p = 0.023$], 0.239 [0.001], and 0.523 [0.00], respectively. This clarifies that innovation conviction has a significant and positive impact on the need for achievement, perseverance, and risk-taking; this means women entrepreneurs' determination and readiness to accept innovation and sincerity to deliver commitments are the innovation factors that lead to the success of the business.

Figure 2
Final measurement model

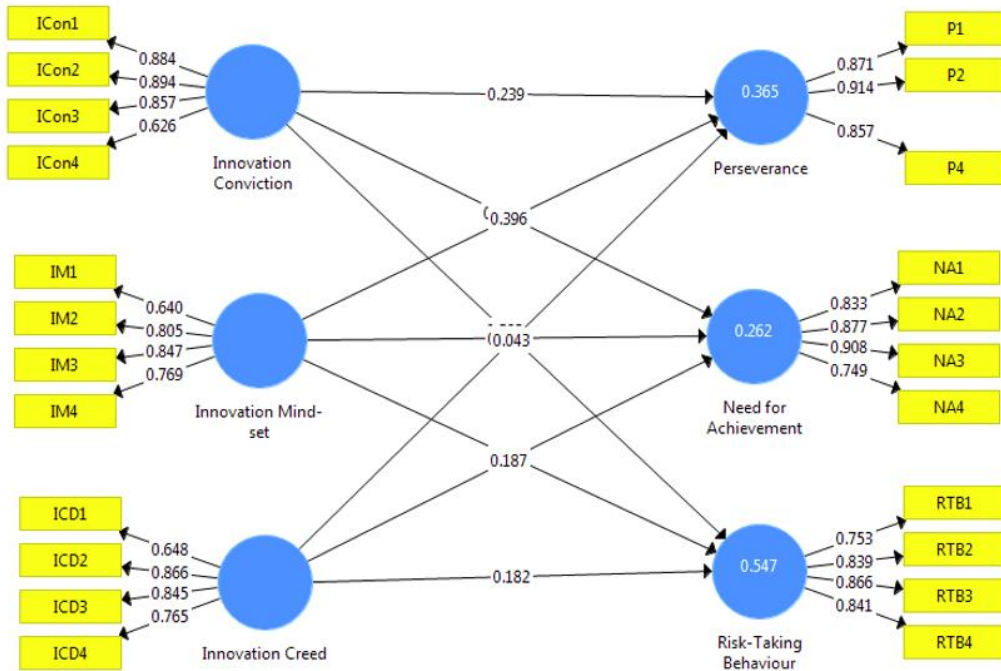


Table 4
Model coefficients estimation output

Path	Path Coefficient	T Statistics	P Values
Innovation Conviction -> Need for Achievement	0.181**	2.288	0.023
Innovation Conviction -> Perseverance	0.239***	3.448	0.001
Innovation Conviction -> Risk-Taking Behaviour	0.523***	8.982	0.000
Innovation Creed -> Need for Achievement	0.187***	2.611	0.009
Innovation Creed -> Perseverance	0.043	0.758	0.449
Innovation Creed -> Risk-Taking Behaviour	0.182***	3.395	0.001
Innovation Mindset -> Need for Achievement	0.238***	2.663	0.008
Innovation Mindset -> Perseverance	0.396***	5.833	0.000
Innovation Mindset -> Risk-Taking Behaviour	0.148**	2.362	0.019

***: showing significance at 1%; **: showing significance at 5%

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On the other hand, if there is one unit of change in the innovation creed, then it is expected that needs for achievement, perseverance, and risk-taking will change by 0.187 [$p = 0.009$], 0.043 [$p = 0.449$], and 0.182 [$p = 0.001$], respectively. This implies that innovation positively and significantly affects the need for achievement and risk-taking behavior, but perseverance is being affected insignificantly. Therefore, it implies that women entrepreneurs's beliefs and motivations for innovation play an important role in the success of their businesses, but this belief does not influence their perseverance. This can be interpreted as a sign that entrepreneur women do not believe that facing adversity can significantly contribute to the success of the business.

In addition to this, a single unit of variance in the innovation mindset would change the need for achievement, perseverance, and risk-taking by 0.238 [$p = 0.008$], 0.396 [$p = 0.000$], and 0.148 [$p = 0.019$], respectively. Therefore, it can be determined that all regressors have a positive and significant impact on the observed variables. Meanwhile, this can also be translated into that an innovation mindset means envisioning and projecting the future positively influencing the success of the business and significantly affecting the need for achievement, perseverance, and risk-taking behavior. Following the path assessment, the summary of hypotheses is presented in Table 5.

Table 5
Summary of hypotheses

Hypotheses	Results
H1: Innovation convention positively impacts female entrepreneurship success.	Accepted
H2: Innovation mindset positively impacts female entrepreneurship success.	Accepted
H3: Innovation creed positively impacts female entrepreneurship success.	Accepted

DISCUSSION AND IMPLICATIONS

In the contemporary business environment, women seek equal rights in every aspect of life, including business, which has led to significant growth in female-led ventures around the world (Demartini, 2018). Meanwhile, the competitiveness of men or women lies with the approach and characteristics of the entrepreneurs, and it has been determined by Lee et al. (2016), Provasnek et al. (2017), and Nambisan et al. (2018) that the characteristics of the men and women entrepreneurs tend to differ based on the gender difference. However, the phenomenon of factors affecting the success of the business remains uniform in either condition. In addition, the equal status of women in the Western world has not been completely adopted in the eastern countries (Ghita, 2015), specifically Middle Eastern countries, including Saudi Arabia. However, recent developments have suggested that female entrepreneurship in the Middle East has been stimulated by the government's support and changing perceptions within the region, and this has provided numerous opportunities for women (Danish & Smith, 2012). In contrast to governmental support and societal change, women have been facing discrimination while pursuing entrepreneurship in the country.

Apart from this, product innovation has been studied to determine how certain characteristics of women have been affecting the success of entrepreneurship, and it has been found that innovation conviction and innovation mindset have been affecting the need for achievement, perseverance, and risk-taking behavior significantly and positively. This implies that sincerity in conveying commitments and a positive attitude toward innovation affect the success of entrepreneurship. In contrast, the innovation creed has been found to have a statistically insignificant effect on perseverance, which means that belief and motivation for innovation do not influence success even after facing adversity in business. Meanwhile, based on the current findings of the study, it can be stated that women's entrepreneurship in Saudi Arabia has been growing, but product innovation can significantly influence the success of entrepreneurship; it is also critical that women have achievement, perseverance, and risk-taking behavior. It is because the need for achievement enables women to consistently work in a direction that is aligned with the mission statement and are eager to achieve something, irrespective of hardship. Similarly, perseverance has also been found critical, along with risk-taking behavior, where both factors have been significantly affected by product innovation. These findings have important practical implications as discussed below.

Towards government and regulatory authorities, there is still a long way to go to bring gender equality in businesses specifically and in society generally. Although Vision 2030 emphasizes innovation and gender equality in society, its implementation will take its due course. Our findings highlight the importance of cultivating innovation conviction, mindset, and creed in women entrepreneurs to be successful in their entrepreneurial ventures. In this regard, the government can take several practical steps to promote women's entrepreneurship and remove the barriers that hinder women's participation in entrepreneurship in the country.

The government needs to implement legal and regulatory reforms to create gender equality, simplify the business registration process, provide equal access to financial resources, and provide dedicated funding programs, loans, and financial incentives for women entrepreneurs. In addition, the government may enhance entrepreneurial skills and foster acumen for innovation in women by developing educational and training programs and even including courses at the school and university levels.

Likewise, the government needs to facilitate networking events, industry-specific forums, and mentorship programs that connect women entrepreneurs with experienced mentors, industry leaders, and potential collaborators. These platforms can provide valuable guidance, support, and access to networks and resources. In addition, innovation and entrepreneurship can be encouraged through incentives, grants, and support for research and development initiatives. Other than that, the government can launch awareness campaigns to promote the benefits of women's entrepreneurship by highlighting the success stories of women entrepreneurs and showcasing their achievements.

Overall, this requires building a supportive ecosystem for women entrepreneurs by investing in infrastructure, such as co-working spaces, incubators, and accelerators, that provide access to facilities, resources, and support services. Additionally, fostering partnerships between government, the private sector, academia, and civil society organizations can create a collaborative environment conducive to entrepreneurship.

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LIMITATIONS AND FUTURE RESEARCH DIRECTION

In this study, the impact of product innovation on the success of female entrepreneurs in KSA has been analyzed with the help of quantitative data gathered through the surveys. Therefore, the findings are limited to the quantitative assessment. However, future researchers can extend this study by incorporating and investigating the qualitative information that can help them compare both findings and explore the phenomenon further in detail. Moreover, future researchers can identify numerous other factors to investigate the impact of product innovation on female entrepreneurs's success in Saudi Arabia and beyond. In addition, they can also investigate the challenges and barriers faced by women in Saudi Arabia and other countries that hinder their way of attaining entrepreneurial success.

CONCLUSIONS

Innovation is considered a vital component for the success of a business venture because it allows the creation of a competitive advantage and takes the lead in a complex business environment. However, from the analysis carried out in this research, it was determined that the beliefs, attitudes, and mindsets of individuals play a central role in keeping entrepreneurs motivated toward innovation and objectives. For female entrepreneurs, motivation is considered the driving force that allows them to adhere to their business goals and accelerate in a forward direction, standing firm against all barriers and challenges. Furthermore, empirical results suggest that perseverance, the need for achievement, and risk-taking behavior are imperative determinants that reflect the success of women entrepreneurs in KSA. In this regard, the impact of innovation, such as innovation convention, innovation creed, and innovation mindset, was tested over perseverance, need for achievement, and risk-taking behavior. Every determinant of innovation has a positive impact on women's entrepreneurship success in KSA. Considering this aspect, the research has certain implications for the government of KSA, which needs to create opportunities to support women and promote the ones already in business.

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CULTURAL AND SOCIO-ECONOMIC FACTORS AFFECTING THE FORMATION OF LEADERSHIP IN ACHIEVING SUSTAINABLE MANAGEMENT: IN THE CONTEXT OF UKRAINE

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Abstract: *New challenges for leaders in the field of sustainable management are awareness of cultural and socio-economic factors in the practice of organizational development and organizational change. The purpose of the article is to contribute to the existing body of knowledge through a systematic study of the influence of culture and socio-economic factors on the formation of leadership in the context of sustainable management. The research methodology includes a literature review, analysis of cultural and socio-economic aspects that influence the formation of leadership for sustainable management. The study is based on the analysis of empirical data obtained through questionnaires. The research results highlighted the impact of culture on leadership in Ukraine, some age differences in the perception of culture as an important element of the triad "sustainable management - leadership - cultural and socio-economic factors", the importance of socio-economic factors and the crucial role of education in the development of leadership for sustainable management. Leaders must adapt their approaches to management, considering cultural aspects, economic conditions and societal demands.*

Keywords: *leadership, sustainable management, culture, social-economic factors, education, Ukraine.*

INTRODUCTION

The triad "sustainable management - leadership - cultural and socio-economic factors" is an important complex of interrelated elements and is relevant in the modern world, as dynamic changes in the economy, social and cultural sphere require new approaches to management and development. Taking this triad into account will allow us to develop effective strategies for achieving sustainable development.

Sustainable management is a key aspect of modern business. It is a strategic approach to management that considers environmental, social and economic aspects. Zvarych and Rivilis (2023) highlighted that "crises have encouraged companies to increasingly include social and environmental aspects in their business activities". Ensuring sustainable development is one of the most urgent problems in the world and is focused on human development, maintaining stability, and reducing social problems which in turn will enhance leadership development.

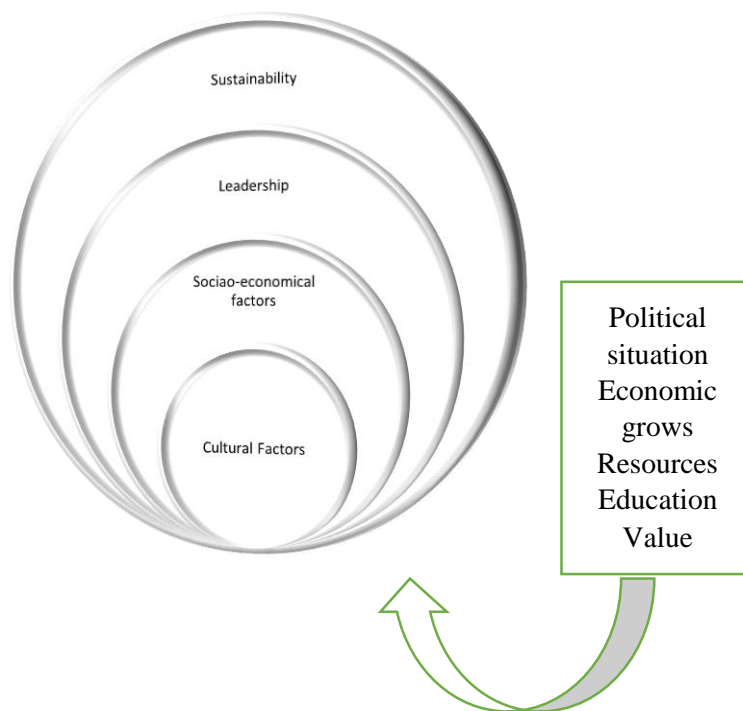
Sustainable management should focus on the practices and strategies used to achieve sustainability in a specific context. This involves responsible and efficient use of resources, minimizing the negative impact on the environment and considering social and economic factors in the decision-making process. Turchyna et al. (2023) proved that businesses that have implemented the principles of environmental, social and management sustainability are easier to adapt to changes.

Leadership plays an important role in implementing the principles of sustainable. Effective leaders can mobilize people by channelling their energy and efforts towards the achievement of sustainable development goals. Tarí et al. (2023) stated, leadership is an influence on groups of people that motivates them to achieve a common goal. Leadership researchers have noted that leadership has positive effects across cultures (Bass & Avolio, 1994), while many scholars have noted the importance of culture, that the effects of leaders vary by geography (Budur & Demir, 2019a, 2019b).

Social and economic factors influence the ability of organizations and leaders to implement sustainable development strategies. In the framework of the implementation of this concept, World Commission on Environment and Development in their report (UN, 1987) mentioned there must be provision for equal dissatisfaction of people's needs and the development of life, including the quality of the environment, the level of culture and education.

Understanding the factors helps leaders make balanced and effective management decisions. We note that culture and socio-economic factors are significant moderators of the relationship between leadership and sustainability, and also share the same values (see the conceptual framework in Fig. 1).

Figure 1:
Conceptual Framework



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This study aims to contribute to the existing body of knowledge through a systematic study of the influence of culture and socio-economic factors on the formation of leadership in the context of sustainable management. By studying how specific cultural aspects, as well as socio-economic factors such as access to education, economic growth, stability of the political situation, shape the formulation of leadership, this study seeks to provide practical information for leaders and practitioners in the development of sustainable management practices. Moreover, understanding the subtleties of this relationship can help in the development of leadership tools aimed at achieving the principles of sustainable development.

LITERATURE REVIEW

Sustainable development is focused on meeting current needs without compromising the ability of future generations to meet their own needs (Buryak, 2023). The individual is the key source and engine of social progress in the context of sustainable development, and its successful provision depends on the creation of favourable conditions for the disclosure of intellectual and creative potential through the manifestation of leadership qualities and initiative of the individual.

In Reichmann's (n.d) research, the key competencies that are necessary for a sustainable development specialist are proposed for consideration: the competence of early, anticipatory thinking; competence of interdisciplinary work; the competence of cosmopolitan perception and change of perspective; competence to deal with incomplete and complex information; competence of participation; competence in interaction, cooperation; competence to deal with the conflict of goals; competence in self-motivation and motivating others; the competence of remote reflection in relation to individual and cultural models; competence to act independently and independently; competence to act ethically; capacity for empathy and solidarity

Daft (2008) claims, that leadership is an interaction between a leader and group members that promotes change and results that meet common goals.

Leaders must have a deep understanding of the cultural characteristics of stakeholders, which helps build trust and effective communication. Pastva (2005), researching leadership in the field of management, reveals it as follows: "Despite the fact that the concept of leadership can be understood differently in different cultures, it is basically defined as a process consisting of a series of constant interactions between the leader and by others. Leadership is also about influence, because leaders motivate other people to do certain things, and this takes place in a group context, involving many individuals and a common goal."

Psychologist Sheinov (2008) defines leadership as "the process of psychological influence of one person on others during their joint life activities, which is carried out on the basis of perception, imitation, understanding of each other. This is a psychological characteristic of the behaviour of group members, based on the principles of free communication and voluntary submission." But this definition does not consider all aspects of leadership, such as societal structures, cultural influences, and political factors. Goldsmith and Clark (2008) state that the purpose of a leader is to create: "relationships based on trust; learning environment; organizational structures, culture and processes that would allow ... to achieve balance in ... life."

According to Tomšič et al. (2015) leadership is one of the most important factors of success, which allows achieving the goal of sustainable development (and is defined as "the ability to influence individuals and mobilize organizations to realize a vision of long-term environmental and social sustainability" (Wolfgramm et al., 2015). Galpin and Whittington (2012) point out that a necessary condition for sustainable development is the involvement of employees, and therefore the involvement of their cultural values for building and cultivating the culture of a sustainable organization.

For all the importance of psychological sources of leadership, sociocultural factors exert the greatest influence on this phenomenon. Usually, scientists consider it as a mechanism of power, the emphasis is on studying its functionality or optimality, but at the time leadership is a culturally and historically determined phenomenon. This is due to the fact that culture is a phenomenon that characterizes the basic, truly human structures of the individual, including his motivational fields. Culture is how a person defines himself and his life and includes his thoughts, ideas and values. Culture is based on ordered systems of values and norms. Socio-cultural factors have the ability to capture, perceive, adsorb, process determining impulses through their own system of value orientations, turning them, ultimately, into direct motives of leaders' activity.

Cultural beliefs and practices influence the acceptance and support of sustainable development initiatives. Hofstede (1980) defines culture as "the collective programming of the mind that distinguishes members of one human group from another." According to him, culture represents various characteristics such as religion, language, traditions, norms or systems and generally it differs from one place to another. Understanding cultural differences helps leaders communicate effectively and implement sustainable management strategies. Cultural factors also influence the formation of leadership in a significant way, because cultural values, beliefs and norms determine what qualities are considered important for a leader and how he is perceived by others. Hofstede (Hofstede, 1996, 2003, 2009, 2011; Hofstede & Bond, 1984) also noted cultural differences in people management as the perception of the value of employees, the behavior of managers, the behavior of consumers and marketing related activities of organizations and customer feedback according to their culture.

The role of culture as a moderator of human resources and firm performance has been investigated (Den Hartog & Robert, 2004) and some types of culture, such as ethical culture, have been found to prevail over sustainability values (Closs et al., 2011). One type of organizational culture that seems compatible with people values (talent, leaders) and organizational outcomes (sustainability) is an ethical culture. Ethics have a strong influence on employee behavior, and an ethical culture ensures fairness and equality in the workplace (Pereira et al., 2017). Ethical values can also relate to the values of sustainable development: protecting the environment and supporting the regional economy (Closs et al., 2011).

This literature review clearly shows the interaction between culture, socio-economic factors and leadership in achieving sustainable development. Organizational culture and socio-economic factors serve as the foundation on which leadership is formed. Leaders must be aware of and attuned to the specifics of the culture, leveraging its strengths, and be able to anticipate and understand the impact of socio-economic factors while addressing potential challenges to create a sustainable environment. In the following sections of this study, an empirical study

will be considered to reveal the influence of culture and socio-economic factors on the formation of leadership for achieving sustainable development.

METHODOLOGY

Research design

To gain insight into the influence of cultural and socio-economic factors that influence the formation of leadership in achieving sustainable management, the authors developed a mixed methods study: in particular, a literature review was conducted from the following stages - planning, implementation, evaluation, and covered about 35 publications in English and in Ukrainian, related to the topic (reports in magazines and conferences, scientific works, official websites). The review process began with the development of research questions and a search strategy. After analyzing and summarizing the information, the authors compared them with the results obtained during their own survey. This was later confirmed by the collection of empirical data. The quantitative empirical research was conducted using a survey questionnaire designed according to individual steps within constructive alignment theory (Biggs & Tang, 2011).

Survey Questions

The data were collected using the web survey mode, and the questionnaire was programmed in the Google Form online data collection tool. The form was distributed through social networks. The questions encompassed narratives:

1. What role does culture play in shaping the concept of leadership in Ukraine?
2. Do national characteristics affect the attitude to leadership in Ukraine?
3. What socio-economic factors contribute to the development of leadership in Ukraine?
4. Does education play an important role in the development of leadership qualities in Ukraine?

Sample and Population

The collected information was analyzed using deductive and inductive approaches. The survey sample included 111 respondents from Ukraine. The survey targeted higher education teachers/academics, graduate students and masters students. All respondents are related to the High Education Sector of Ukraine. Sampling proved beneficial for this research due. However, with only 1111 represents this may not have represented the entire population, but that results show some trends.

The main demographic characteristics of the sample are presented in Tables 1 and 2. The largest share of respondents was with a PhD (46/8%) and a Master's degree (44/1%), and the sample was unbalanced by gender (51.0% men, 49.0% women). In the sample there were more people over 41 years old (69.1%), and the majority of respondents were pedagogically active in Ukraine (91.0%).

Table 1:

Representatives by sex/age

From 20 to 30 years	12
Women	9
Men	3
From 31 to 40 years	22
Women	18
Men	4
From 41 to 50 years	43
Women	41
Men	2
Older than 50	34
Women	30
Men	4
Grand Total	111

Table 2:

Representatives by degree

Bachelor	7
PhD	52
Master	49
Secondary school	3
Grand Total	111

Culture acts as a prism through which people perceive events, make decisions and respond to challenges (Kilag, et al., 2023). In the context of sustainable development, culture provides a meaning-making mechanism that guides leaders to achieve goals and determine appropriate responses (du Plessis et al., 2022).

Russia's aggression against Ukraine has created obstacles to achieving sustainable development, such as collecting quality and timely data. But authors were able to collect data and analyse it. In the next section, the authors will present research results on the influence of cultural and socio-economic factors that contribute to sustainable development on the formation of leadership in Ukraine.

RESULTS AND DISCUSSION

The analysis based on the literature provided insight into the complex interaction between culture and leadership formation in the context of sustainable development. As a result of the generalization of empirical data, the following important questions- themes arose proposed by the authors for discussion.

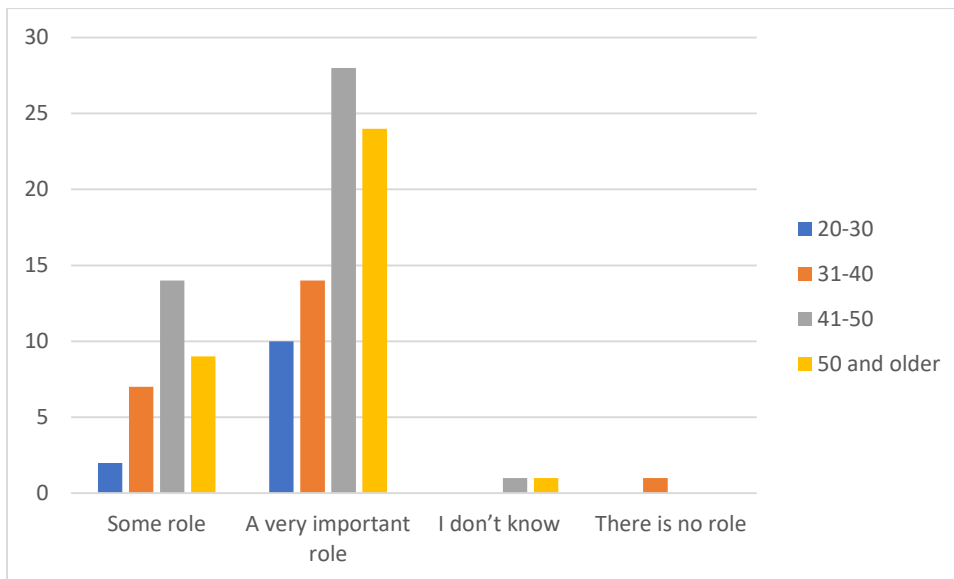
Question 1: What role does culture play in shaping the concept of leadership in Ukraine? (fig.2)

A synthesis of the results of the literature analysis revealed the influence of culture on the formation of leadership (Uy et al., 2023).

Previous research emphasizes that leadership has a strong connection with culture, which in turn affects competitive advantage in the long run.

Figure 2:

The role of culture in the formation of the concept of leadership in Ukraine



Leaders who work within the framework of cultural characteristics demonstrate the ability to innovate strategies in ensuring sustainable development, emphasizing the importance of matching cultural norms with dynamic requirements. The literature emphasizes the role of adaptability as a key attribute in culture that affects the orientation of leaders (Uy et al., 2023).

The mode in this case would be “A very important role” since it appears most frequently in the data. This shows that a significant proportion of respondents believe that culture plays a very important role in the formation of leadership concepts in Ukraine.

The difference in awareness of the role of culture in leadership formation between people aged 40+ and young people may be related to their experience and life situations. People 40+ have more opportunities to observe and experience, which allows them to better understand the influence of culture on leadership. While youth may be less aware due to lack of such life experience and limited opportunities to observe other cultural contexts. In addition, young people may be more prone to innovation and change, leading to less focus on traditional aspects of culture.

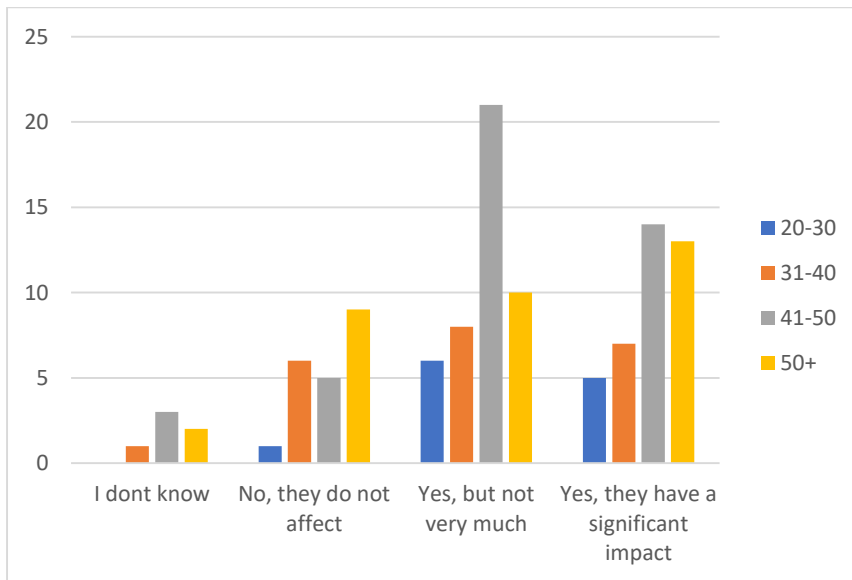
Leaders who consider the postulates of culture demonstrate understanding, confidence and a proactive position in ensuring sustainable development. This approach is characterized by openness to change, clear identification and will allow to form a leadership that is ready to give challenges in ensuring sustainable development. Question - theme 1 emphasizes the key role of culture in the formation of leadership in the conditions of sustainable development, particularly in the context of Ukraine. This widespread recognition suggests a strong belief in the influential role of culture in shaping leadership paradigms, thereby emphasizing its relevance for sustainable management practices (incorporating diverse perspectives and cultural values into decision-making processes promotes inclusivity, implementation of effective cross-cultural communication mechanism, management to align with local cultural norms and practices what demonstrates respect for indigenous knowledge and traditions etc.).

The positive correlation emphasizes the importance of the fact that the knowledge of cultural attributes will create a basis for the formation of leadership aimed at sustainable development. This aspect contributes to understanding and practical perception, emphasizing the need to explore cultural specificities as an asset for navigating sustainable development.

Question 2: Do national characteristics affect the attitude to leadership in Ukraine? (fig.3). Leaders who use cultural attributes to create a climate of trust, fostering an enabling environment for making more informed and optimal decisions (Meng & Berger, 2019).

Figure 3:

The influence of national characteristics on the attitude to leadership in Ukraine



The majority of respondents believe that national characteristics do not have a very significant influence on attitudes to leadership, which somewhat contradicts generally known facts. The reason for this may be Ukrainian society's tendency towards collectivism, where many people jointly make decisions, which can reduce the importance of an individual leader. In addition, in the historical context of Ukraine, there were many changes in the power and political system, which could lead to a more sceptical attitude towards leadership as such and considering the peculiarities of culture in management. Despite this, it is a positive fact that 35% of respondents believe that national characteristics significantly influence the attitude to leadership in Ukraine, because culture has its own unique values, beliefs and requirements for leaders. Cultural norms can determine what qualities are considered important in a leader, for example, whether an authoritarian leadership style is valued or whether teamwork is more sought after.

This question-topic has implications for leaders who seek to expand knowledge about the influence of national characteristics for the development of cultural strategies of management and communication in the international arena. The practical application of such knowledge can contribute to the improvement of cooperation and understanding of international partners and contribute to the successful sustainable management of business in the conditions of globalization.

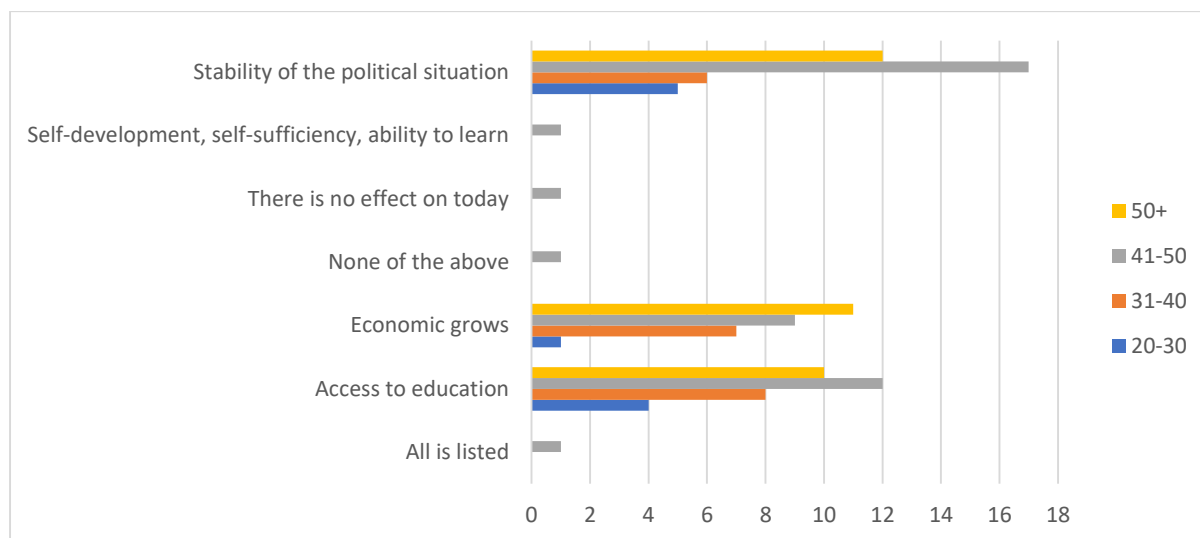
Question 3: What socio-economic factors contribute to the development of leadership in Ukraine? (fig.4)

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Socio-economic factors are vital for understanding the complexity of society, promoting economic development, making business decisions, and developing human capital. Recognizing the importance of these factors is essential to building a resilient, sustainable and thriving company.

Figure 4:

Socio-economic factors what contribute to the development of leadership in Ukraine



Literature highlights socio-economic factors that can create challenges and opportunities for organizations (Masuo et al., 2001). Some researchers (Thapa, 2007; Indarti & Langenverg, 2008) stated that education has a positive effect on business success. Raman (2004) noted that economic conditions lead to success. Rogoff et al. (2004) found that economic conditions, competitive environment, and governmental regulations significantly influence the success of businesses. Muhammad (2012) discovered that higher general education enables business people to understand the world. Leaders must understand the social and economic context in which they operate. This includes understanding the level of income, education, employment and other socio-economic indicators that affect the lives of their subordinates and stakeholders (Indarti & Langenverg, 2008).

Respondents noted that organizations that understood their socio-cultural factors were particularly associated with leaders who adopted optimal approaches to decision-making.

Some respondents noted that self-development, self-sufficiency, ability to learn are a group of factors that influence the development and formation of leadership. Leaders who work on self-development and have the ability to learn constantly increase their skills and understanding in their field. They are open to new ideas and approaches, as well as to feedback from their colleagues and employees.

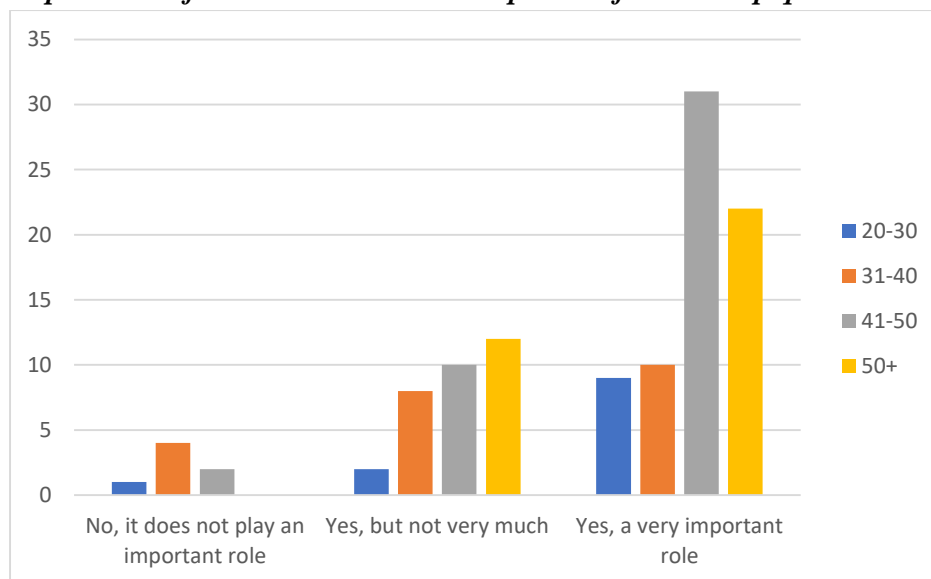
The results of the theme 3 analysis confirmed statements, demonstrating that social-economic factors such as access to education, economic growth, and the stability of the political situation contribute to the development of leadership in Ukraine.

Question 4: Does education play an important role in the development of leadership qualities in Ukraine? (fig. 5)

Some researchers found that the education has positive effect on business success (Lussiers & Pfeifer, 2001; Masuo et al., 2001; Thapa, 2007; Indarti & Langenverg, 2008). Astin and Astin (2000) stated leadership is based on personal status and professional recognition. At the same time professional recognition related to the development of professional knowledge, which is turn is obtained through the appropriate level of education. Black S. (2015) noted that leaders need a combination of leadership and management competencies. In order to get people knowledge, skills and opportunities for improvement, it is necessary to study and get a degree. And as a result, learn various aspects of leadership, such as communication, decision-making. Leadership contributes to the implementation of innovations, the development of new ideas and strategies, which balances social, economic and environmental development.

Figure 5:

Importance of education in the development of leadership qualities in Ukraine



The results of the analysis highlighted the importance of education in developing leadership skills. 75% said education plays an important role in developing leadership skills. It is worth noting that people over 40 have more self-confidence and are aware of this statement. Based on their experience and professional knowledge and skills, they know that managers with a solid education are able to better understand the complex problems of the modern world, work to solve them and implement sustainable development strategies in various areas of society, economic, social and ecological aspects.

Educated leaders are better equipped to devise and implement sustainable management practices across diverse sectors, encompassing societal, economic, and environmental aspects.

This topic provides valuable information for organizational leaders and highlights the need for a strategic and differentiated approach to human capital development. Together, these four themes contribute to a more comprehensive understanding of how cultural and socioeconomic factors influence leadership development in achieving sustainable governance.

The results highlight the need for managers to recognize the influence of cultural and socioeconomic factors on leadership development in order to achieve sustainable management. The identified themes provide a basis for further research and the clarification of theoretical foundations that guide the knowledge and integration of cultural and socioeconomic factors in the training of managers to achieve sustainable management.

CONCLUSIONS

This meta-analytic study is based on the analogy of the triad "sustainable management - leadership - cultural and socio-economic factors". The four identified questions - topics contribute to the generalization of information that emphasizes the relationship between culture, education, socio-economic factors and the development of leadership in Ukraine in conditions of sustainable development. Understanding and mastering these interrelated elements is essential to developing and shaping effective leadership practices that are responsive to cultural dynamics and promote sustainable management.

The first theme highlighted the positive relationship between cultural norms and values on leadership practice, emphasizing the need for leaders to align strategies with cultural dynamics. It has been found that leaders who cultivate a culture demonstrate increased resilience and a willingness to implement innovative strategies. It was also found that there is a marked difference in the perception of the role of culture in leadership between people aged 40+ and younger people. Older people, having more life experience, are more likely to recognize the influence of culture on leadership.

The second theme revealed some differences with the generally accepted notions, but despite the fact that the majority of respondents did not agree with the statement about the significant influence of national characteristics on attitudes towards leadership, a significant proportion of them still recognized their importance. This disagreement may follow from collectivist tendencies in Ukraine.

The third question-topic emphasized the importance of socio-economic factors such as access to education, economic growth and political stability in promoting leadership development in Ukraine, but respondents noted that leaders who constantly invest in self-improvement and self-sufficiency, as well as take advantage of opportunities for learning and improving their skills positively influence their leadership effectiveness.

Education became a central theme in the fourth question, emphasizing its role in building leadership skills. Well-educated leaders are better equipped to understand today's challenges, develop effective solutions, and implement sustainable development strategies.

We support Smolović et al (2023) with the conclusions that sustainable management assumes different knowledge and skills acquired by studying social sciences and different areas of natural sciences because it enables a comprehensive understanding of sustainability challenges, facilitates stakeholder engagement, supports evidence-based decision-making, and fosters innovation and problem-solving.

Leaders who integrate cultural and social-economic insights into their practices will be able to demonstrate proactive engagement and readiness to tackle challenges associated with sustainable development. This proactive stance, characterized by openness to change and clear identification of cultural, social and economic nuances, lays the foundation for cultivating leadership capable of effectively creating sustainable management.

Limitations of research.

More than 111 responses were required for clear trends in statistical tests. One of the limitations of this research was the time. It is generally accepted that people do not dare to spend their time on the survey, and the effectiveness of the survey largely depends on the response rate. Another limitation concerns response bias. This bias occurs when respondents

tend to give answers that they think are socially acceptable, rather than express their true opinions. Additionally, the validity of multiple-choice surveys may be compromised by the limited range of available responses.

Future research directions.

Future research directions could include investigating how leaders can innovatively use cultural aspects to achieve sustainable management, such as using cultural flexibility to drive change, or could focus on developing and testing leadership training methods that take cultural and socio-economic factors into account.

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NEETS INTEGRATION INTO SOCIAL AND ECONOMIC ACTIVITY IN A CONTEXT OF SUSTAINABILITY

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Abstract: *This article examines the integration of “Not in Education, Employment, or Training” (NEETs) into social and economic activities within the context of sustainability. NEETs represent a significant challenge for societies, as their exclusion from these activities can have adverse economic, social, and environmental consequences. The article explores sustainable approaches to address this issue, considering the potential of social entrepreneurship, green jobs, and environmentally friendly initiatives in fostering the integration of NEETs in different countries. Additionally, it discusses the importance of education and training programs that align with sustainable development objectives and empower NEETs to actively participate in a sustainable economy. The factor and regression analysis were used for this research. By exploring the nexus of NEETs integration, social and economic activities, and sustainability, this article offers insights and recommendations to policymakers and stakeholders aiming to promote inclusive and sustainable societies from the perspectives of examined countries.*

Keywords: *NEETs, education, employment, training, entrepreneurship, integration.*

INTRODUCTION

NEETs (the acronym for “Not in Education, Employment, or Training”) refer to individuals who are not engaged in any form of education, employment, or vocational training. This phenomenon typically applies to young people, often in the age range of 15 to 29, who are not enrolled in school, are unemployed, and are not participating in any training programs (Rahmani & Groot, 2023).

The term NEETs was first introduced by the Organisation for Economic Co-operation and Development (OECD) in the late 1990s. Now the OECD played a significant role in popularizing and conceptualizing the NEET category as a way to measure the disengagement of young people from education, employment, and training. The concept gained traction as researchers, policymakers, and international organizations began to recognize the importance of addressing the challenges faced by young people who are neither in education nor employed (Dluhopolskyi & Zhukovska, 2023; Zatonatska et al., 2022).

This study proposes an analysis of integration pathways into social and economic activity among NEETs representatives based on case studies from various EU countries. The research question consists in clarifying the differences in the trends of distribution of NEETs in European countries and generalizing the methods of their socio-economic adaptation.

LITERATURE REVIEW

The country that is most famous for researching the NEET phenomenon is Japan. NEET as a term gained rapid popularity in Japan after the publication of the “White Paper on Labor Economy 2004” by the Japanese Ministry of Health, Labor, and Welfare (MHLW). Mass-media, researchers, tabloids, newspapers, and NGOs made NEET definition popular and buzz (Rahman, 2007; Rahmani & Groot, 2023). The depletion of human capital, known as “scarring effect”, frequently leads to recurrent periods of unemployment and reduced future earning potential (Gangl, 2006).

The article (Schmidt, 2021) explores the phenomenon of NEETs in Japan, where there has been a notable increase in young people choosing unemployment, contrary to traditional social norms. While Japan has long upheld the ideal of lifelong employment, many young individuals are opting out of this conventional path due to various factors, including dissatisfaction with the demanding work culture, personal circumstances such as health issues or caregiving responsibilities, and changing economic realities. However, society often stigmatizes those who opt out of traditional employment, viewing them as lazy or even criminal. This stigma is deeply ingrained, to the extent that some individuals continue to maintain the facade of employment even after losing their jobs. Additionally, chosen unemployment is perceived as detrimental to the workforce and economy, exacerbating labour shortages in Japan. Despite societal disapproval, there is a growing trend of “neo-NEETs” who reject traditional employment but still find ways to earn income, often through online platforms or freelance work. While they may not conform to the conventional work ethic, they demonstrate a willingness to contribute to society on their terms (Schmidt, 2021).

Some researchers argued (Kosugi, 2005a; Kosugi, 2005b; Hoang, 2016; Rahman, 2007), that NEETs in Japan have different attributes from those in other countries, defining them in few categories (Table 1): yankee; hikikomori; tachisukumi; tsumazuki, and regard them as Japanese-style NEETs. Others, like K. Rahman (2007), Y. Hori (2005) define NEETs based on their background and values, namely reluctance to assume responsibility, socially reclusive, parasite single, ambition indifferent, and family ruining.

Table 1

Japanese-style NEETs

№	Type of NEETs	Characteristics
1.	Yankee-type	Antisocial type but seeks pleasure
2.	Hikikomori-type	Unable to build social relationships type and remains confined at home (reclusive or unsociable). “Those who are neither in work nor school, do not have social interactions and are socially withdrawn for more than 6 months”.
3.	Tachisukumi-type	Overly conscientious in job-hunting type but ultimately breaks down after failure (fear paralyzed)
4.	Tsumazuki-type	Job quitter type who finds employment, yet soon quits, loses confidence after a while, and then plunges into despair

Source: developed based on (Kosugi, 2005a; Kosugi, 2005b; Hoang, 2016; Rahman, 2007; Norasakkunkit & Uchida, 2012; Uchida & Norasakkunkit, 2015).

To gain a comprehensive understanding of the diverse NEET cohort, Eurofound (2016) suggests categorizing them into distinct subgroups (Table 2): economically active and economically inactive NEETs.

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Table 2
NEETs classification (Eurofound)

Economically active NEETs	Economically inactive NEETs
Unemployed NEETs – those actively seeking and available for work: - long-term unemployed NEETs – individuals unemployed for over one year; - short-term unemployed NEETs – individuals unemployed for less than one year.	Discouraged NEETs – individuals who believe no work is available despite their willingness.
	NEETs with a disability – those unable to work due to incapacity, illness, or disability.
	Care-giving NEETs – individuals with family responsibilities, such as caring for children or relatives.
	Re-entrants – individuals awaiting imminent re-entry into employment, education, or training.
	Other NEETs – a residual group encompassing: 1) voluntary NEETs engaged in individual activities like traveling, volunteering, or informal study; 2) those reliant on family financial support; 3) youth facing more complex life challenges.

Source: developed based on (Eurofound, 2016; Assmann & Broschinski, 2021)

The study (Assmann & Broschinski, 2021) delves into the concerning rise of young people categorized as NEET across European countries over the past decade. By utilizing fuzzy-set Quantitative Comparative Analysis (fsQCA) on aggregated EU Labour Force Survey data from 2018 across 26 European countries, the study uncovers the intricate relationship between institutional configurations and the prevalence of various NEET subgroups. The findings underscore that the institutional drivers of NEET status are as varied as the group itself. For instance, countries with insufficient family-related services coupled with weak formalized long-term care tend to exhibit higher rates of young NEETs with care responsibilities, particularly evident in Central Eastern European nations. Conversely, Northern European countries with generous yet ineffective disability benefit schemes tend to have elevated proportions of NEETs with disabilities, fostering disincentives for labour market participation. Additionally, countries experiencing economic crises alongside labour market rigidities and inadequate vocational training policies, such as Southern and some Central Eastern European countries, tend to have higher rates of unemployed and discouraged young NEETs.

The article (Avagianou et al., 2022) presents a theoretically grounded empirical investigation into the uneven spread of young individuals categorized as NEETs across the EU South, specifically in Italy, Spain, Greece, and Cyprus, spanning from 2008 to 2018. Through the lens of “youth spaces”, the analysis critically evaluates the economic, social, and political dimensions shaping the intricate relationship between youth and the labour market, particularly addressing the persistent prevalence of NEETs in the EU South. The forms of labour precariousness experienced by young people vary spatially and encompass unpaid internships, low-paying contracts, family labour without compensation, and non-standard or informal employment arrangements (Gialis et al., 2020; Avis, 2014; Quintano et al., 2018). These practices evolve from eroded collective social bonds and exclusionary labour market structures, shaping the reproduction of young labourers. Notably, Southern European countries within the EU are often characterized as fragmented socio-economic entities within semi-peripheral yet advanced capitalist systems (Gambarotto et al., 2019; Surmanidze

et al., 2023; Hajiyeva et al., 2023; Zvarych & Brodovska, 2023; Zvarych & Rivilis, 2023). These economies are service-oriented, historically providing limited well-paid permanent positions for young individuals (Leontidou, 2012; Ruesga-Benito et al., 2018). Labor precarity, informal employment practices, and insecure flexibility have long been prevalent among younger generations in these societies (Gialis & Leontidou, 2014; Okulich-Kazarin et al., 2024).

The paper (Maynou et al., 2022) examines the convergence of NEET rates across 274 European regions from 2000 to 2019. This study contributes to understanding regional differences in NEET rates and highlights the importance of tailored policy measures to address youth inclusion and employability. But further research is needed to explore the NEETs integration in social and economic activity in a context of sustainable development.

METHODOLOGY

The methodology employed in the article involves K-means clustering within the EU and further analyzing pathways for NEETs integration into the socioeconomic activities of their countries. K-means clustering, a technique rooted in vector quantization originating from signal processing, endeavors to segregate a set of n observations into k distinct clusters, with each observation assigned to the cluster possessing the closest mean, commonly referred to as cluster centers or cluster centroids, thus serving as an archetype of the respective cluster (Sharma, 2024).

The overall objective of k-means clustering is to minimize the within-cluster sum of squared distances, making it particularly useful for partitioning data into compact, well-separated clusters, which can be mathematically represented as (Sharma, 2024):

$$\sum_{j=1}^k \sum_{x_i \in C_j} \|x_i - \mu_j\|^2, \quad (1)$$

where the outer summation goes over all clusters and the inner summation calculates the sum of squared distances between data points and their respective cluster centroids within each cluster.

However, its performance can be sensitive to the initial selection of centroids and may not be optimal for datasets with non-linear or irregular cluster shapes.

The k-means clustering algorithm can be summarized by the following steps:

- 1) initialization – randomly select k data points from the dataset as the initial cluster centroids;
- 2) assignment step – assign each data point to the cluster with the nearest centroid. This can be represented mathematically as:

$$\operatorname{argmin}_j \|x_i - \mu_j\|^2, \quad (2)$$

where x_i represents the i th data point, μ_j represents the centroid of the j th cluster.

- 3) update step – recalculate the centroids of the clusters by computing the mean of all data points assigned to each cluster. This can be represented mathematically as:

$$\mu_j = 1/n_j \sum_{x_i \in C_j} x_i, \quad (3)$$

where C_j represents the set of data points assigned to cluster j , n_j represents the number of data points assigned to cluster j .

- 4) convergence – repeat the assignment and update steps iteratively until convergence criteria are met, such as minimal change in cluster assignments or reaching a maximum number of iterations;
- 5) final clustering – once convergence is achieved, the final clustering is obtained, where each data point belongs to one of the k clusters based on its proximity to the cluster centroids.

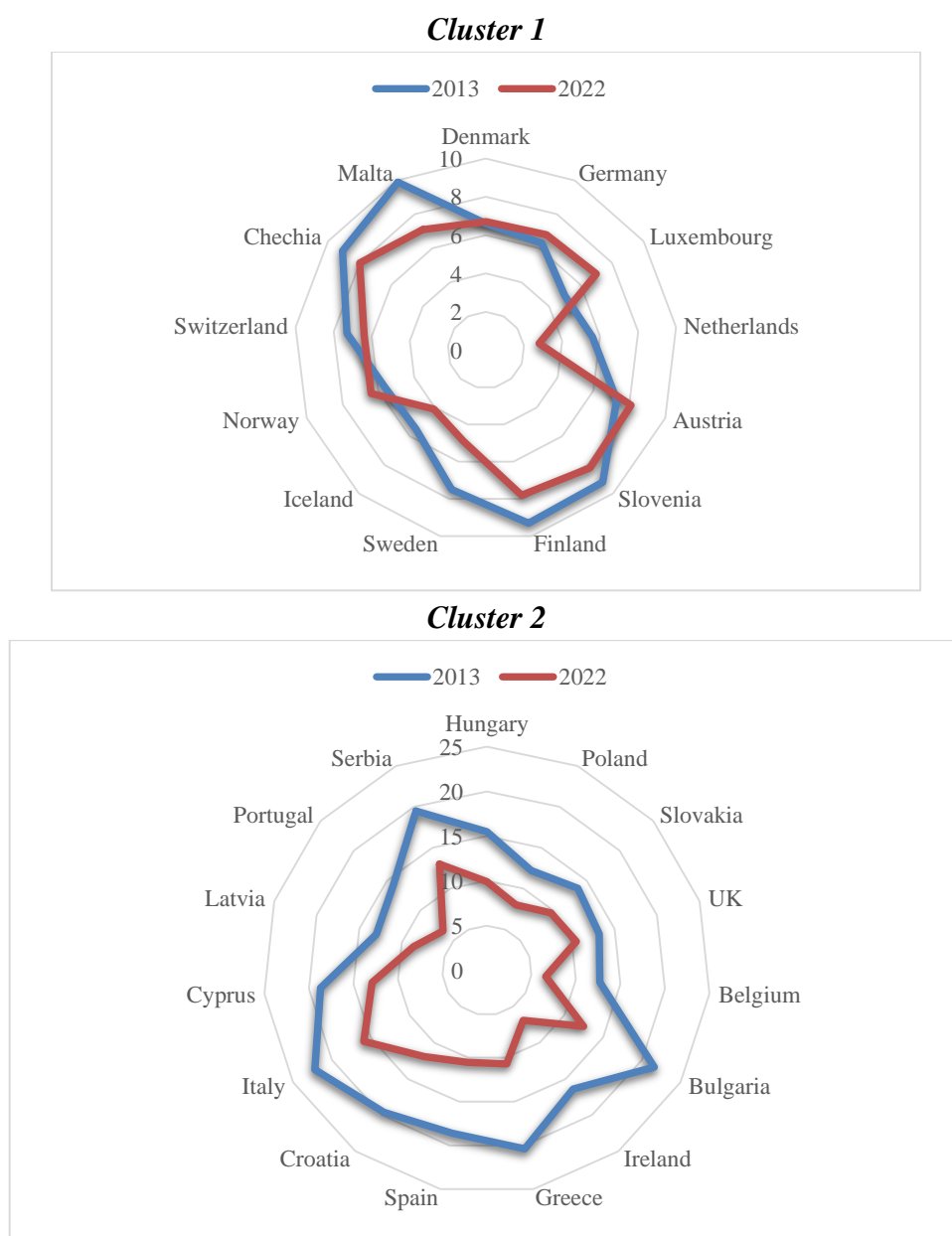
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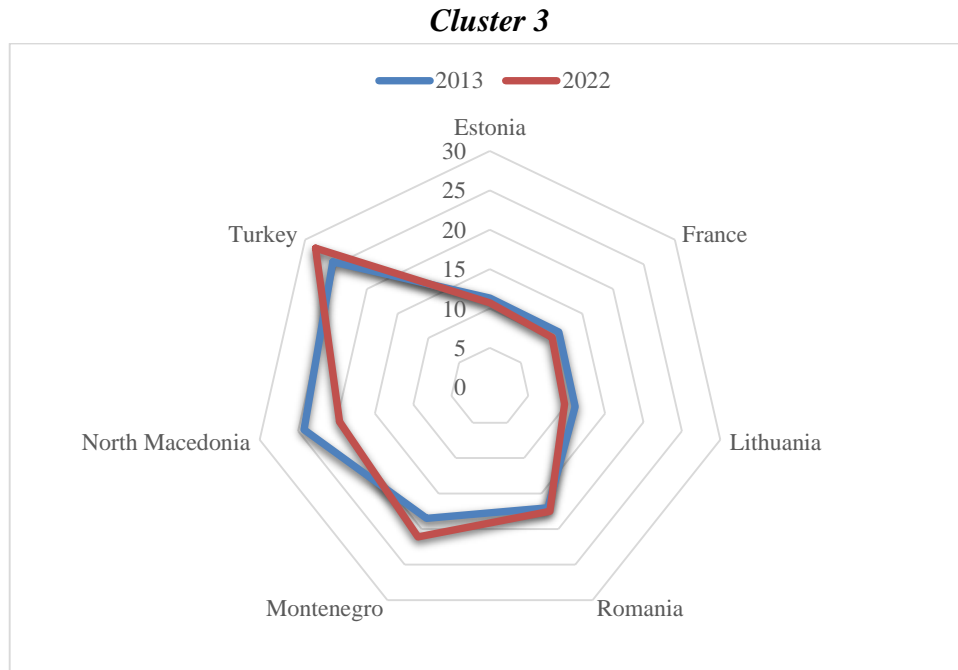
RESULTS

Currently, the phenomenon of NEET poses a significant national challenge, characterized by a notable lack of clarity regarding both its prevalence and the fundamental factors driving it. Effective solutions and interventions remain elusive, awaiting further exploration and understanding.

To cluster the countries based on their NEET rate dynamics, we can use the K-means clustering algorithm. As a result, we can group countries into three clusters (Figure 1, Table 3): cluster 1 – countries with consistently low NEET rates or positive changes; cluster 2 – countries with high NEET rates in 2013 but significant reductions by 2022; cluster 3 – countries with relatively high NEET rates and minimal improvements or even increases over the period.

Figure 1
NEETs clusters





Source: own research based on (Eurostat, 2023).

Table 3
NEETs dynamics 2013-2022

Countries	2013	2022	Change, %
Cluster 1			
Denmark	6,6	6,7	0,1
Germany	6,3	6,8	0,5
Luxembourg	5,0	7,0	2,0
Netherlands	5,6	2,8	-2,8
Austria	7,3	8,1	0,8
Slovenia	9,2	8,2	-1,0
Finland	9,3	7,8	-1,5
Sweden	7,5	4,9	-2,6
Iceland	5,5	4,1	-1,4
Norway	5,6	6,4	0,8
Switzerland	7,3	6,4	-0,9
Czechia	9,1	8,0	-1,1
Malta	9,9	7,1	-2,8
Cluster 2			
Hungary	15,5	9,9	-5,6
Poland	12,2	8,0	-4,2
Slovakia	13,7	9,6	-4,1
UK	13,2	10,5	-2,7
Belgium	12,7	6,6	-6,1
Bulgaria	21,6	12,5	-9,1
Ireland	16,4	6,9	-9,5
Greece	20,4	10,7	-9,7

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Spain	18,6	10,5	-8,1
Croatia	19,6	11,9	-7,7
Italy	22,2	15,9	-6,3
Cyprus	18,7	12,9	-5,8
Latvia	13,0	8,6	-5,0
Portugal	14,1	6,6	-7,5
Serbia	19,5	13,0	-6,5
Cluster 3			
Estonia	11,3	10,7	-0,6
France	11,2	10,1	-1,1
Lithuania	11,1	9,7	-1,4
Romania	17,0	17,5	0,5
Montenegro	18,5	21,1	2,6
North Macedonia	24,2	19,6	-4,6
Turkey	25,5	28,3	2,8

Source: own research based on (Eurostat, 2023).

Referring to the experience of the countries of the cluster 1, we can note several features of integration NEETs into the socio-economic life of communities. Over the past decade, numerous policy initiatives in the Nordic nations have been dedicated to addressing and providing assistance to NEETs. A multitude of projects, spanning local, regional, and national levels, have been implemented to facilitate the integration of this demographic into educational and employment opportunities.

In recent years, both national and regional authorities in Denmark have made significant efforts to address the re-engagement of marginalized young people. One notable initiative is the establishment of guidance centres, mandated to reach out to early school leavers up to the age of 25 (Karlsdóttir, 2024). These centres aim to assist youths by providing a range of education programs and facilitating their transition to suitable educational pathways, training opportunities, or employment prospects. Challenges faced by young dropouts in Danish rural areas include a lack of role models, particularly in socially deprived small towns characterized by high unemployment rates and a need for skills enhancement. Additionally, certain groups, such as individuals with mental health issues or radicalized youth at risk of criminal involvement, present further complexities.

Another project, operating across six centres in Denmark, predominantly in rural areas, adopts the philosophy of consequence pedagogy, encapsulated in the principles of proactive action, accountability, and forward-thinking. This approach has demonstrated effectiveness in engaging the most vulnerable segment of young people. Referred to as TAMU (Karlsdóttir, 2024), this program offers personalized consultations and real work opportunities to participants aged 18–30, many of whom possess limited formal education. Participants receive housing, meals, and a structured environment akin to military discipline. TAMU aims to empower these individuals to become valued members of the workforce, regardless of past challenges such as criminal backgrounds or substance abuse histories. The program emphasizes the development of essential life skills alongside practical work experience across various sectors. Municipalities play a crucial role in funding both projects, contributing to trainee salaries and reinforcing the significance of these initiatives in promoting youth re-engagement and rehabilitation.

In 2019, Finland enacted national legislation known as Nuorisolaki 1285/2016, which mandates municipalities to employ proactive social workers tasked with actively reaching out to marginalized young individuals. Finland has garnered positive experiences through its proactive outreach efforts aimed at youths who have become disengaged from conventional support systems (Halvorsen et al., 2013). One-stop guidance centres, also known as low-threshold services, have been established in Finland to cater to young individuals who are unemployed, not engaged in training, or out of education. These guidance centres offer comprehensive support services encompassing general guidance, specialized education, social care, healthcare, and employment assistance, all conveniently available in a single location and free from bureaucratic complexities.

Referring to the experience of the countries of the cluster 2, for example, Italy stands out in the European Union for its high rate of NEET. In response to this problem, the Italian government introduced a “NEET plan” in January 2022 aimed at addressing the more than 3 million young people in the country who are neither working nor in education or training. The plan focuses on reinforcing existing measures such as the Youth Guarantee, establishing youth desks at employment centers, and providing informational support through campaigns like GIOVANI2030 (Montasser, 2022). Additionally, efforts are being made to promote the inclusion of young people with fewer opportunities in programs like Erasmus+ and the European Solidarity Corps. Despite these efforts, further action is needed to effectively tackle the NEET issue. A survey among Italian NEET individuals revealed that many had never visited employment centers, indicating a need for broader outreach initiatives. Additionally, investment in childcare and care facilities is crucial, as many NEETs cite family responsibilities as a barrier to employment or education. Moreover, targeted education programs with practical training components can better prepare young people for the job market (Quintano et al., 2018).

NEET phenomenon in Italy is marked by regional disparities, with Southern Italy being particularly affected, as well as gender inequality, disproportionately impacting women. By identifying different groups within the NEET population and implementing targeted measures, such as the NEET plan, Italy aims to reduce the number of young people facing economic inactivity. However, additional efforts, including promotional campaigns and support for young mothers, are essential to fully address the complexities of the issue.

According to Spain and Portugal, however, age is positively associated with long-term unemployment across countries. Additionally, higher educational attainment is associated with a lower likelihood of long-term unemployment but a greater likelihood of short-term unemployment. The research (O’Higgins & Brockie, 2024) highlights the relationship between vulnerability to poverty or social exclusion, individual characteristics, and NEET subgroups. It reveals that vulnerability is more pronounced among young NEETs compared to young workers or students and varies significantly across different types of NEETs. Particularly, vulnerability is notably high among young people NEET due to family responsibilities, primarily young women, and this vulnerability has increased over time.

Referring to the experience of the countries of the cluster 3, researchers (Işık, 2016; Özdemir et al., 2023) investigated the challenges of youth unemployment and NEET phenomenon within the Turkish context. The research comprehensively addressed various aspects such as workforce demographics, gender-specific data analysis, and the interconnected issues of education, unemployment, and economic stagnation affecting the young labour force. Findings highlighted

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Turkey's leading position in NEET rates among OECD nations (Table 3), primarily attributed to gender disparities.

According to Turkey, Romania, higher education correlates with lower instances of low digital skills. Access to education and digital skills training is crucial, especially for rural youth facing barriers to traditional mobility. Gender disparities persist, with women disproportionately represented among NEETs, reflecting broader global trends of gender discrimination in education and employment. Addressing these disparities is essential for achieving gender equality and empowering women and girls, particularly in rural communities (Neagu et al., 2021; Kiziloglu et al., 2023). Improving access to education and digital skills can break the cycle of poverty and enhance civic engagement. However, rural populations in Romania and Turkey face numerous challenges, including limited education access and job opportunities, contributing to a significant portion of youth being classified as NEETs.

The Government of the Republic of North Macedonia since 2018 introduced the Youth Guarantee to provide NEETs for 4 months, offering employment, continuing education and training, or internship. Having in mind the success of the implementation of the Youth Guarantee 2018-2019, the Plan for the implementation of the Youth Guarantee 2020-2022 was adopted. In 2023, a new Plan for the implementation of the Youth Guarantee for the period of 2023-2026 was adopted, continuing the commitment to enhancing young people's access to the labour market (Integration of young people, 2024).

The Youth Guarantee in the Republic of North Macedonia provides the following services: professional orientation and career counselling; motivational training; individual and group counselling; and job search training. The Youth Guarantee foreseen the following employment measures: subsidies for the employment of young people; and incentives for hiring young people with disabilities.

DISCUSSIONS AND CONCLUSIONS

The limitations of the scientific article are that the problem of NEETs is a relatively new phenomenon in behavioral research, affects several state policies (demographic, social, educational, economic) and in each country its challenges are overcome with its own set of tools. That's why we made an attempt to cluster countries, highlighting common best practices.

Strengthening social protection emerges as crucial in discouraging youth from becoming NEETs, emphasizing the need for comprehensive public policies covering various domains like health and education to foster youth development without disparities. Future research should adopt a dynamic perspective, analyse a broader range of years, and delve deeper into the influence of specific policies on youth engagement and social inclusion to foster sustainable development. Moreover, further investigation into country-specific social policies' impact on including NEETs is warranted.

By employing a combination of different methods and tailoring interventions to the specific needs and circumstances of NEETs (mentorship and support networks, employer engagement, career counselling and guidance, financial incentives, youth employment programs, et.), policymakers, employers, and community organizations can work together to facilitate their successful integration into the labour market. Each country, as it turns out, develops its own mechanisms of social and economic integration of NEETs depending on the needs and goals of its own development.

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FISCAL POLICY FRAMEWORK IN A DECARBONIZED FUTURE FOR RESOURCE-RICH COUNTRIES

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***Abstract:** In a world transitioning towards decarbonization, resource-rich countries (RRCs) face unique challenges in shaping their fiscal policy frameworks, necessitating significant adjustments. This paper analyzes the effects of decarbonization on the fiscal policies of RRCs, focusing on the intersection of fiscal sustainability and sustainable development goals. The key findings reveal that effective fiscal discipline is crucial for maintaining fiscal sustainability amid fluctuating resource revenues. Implementing medium-term budget frameworks helps RRCs manage economic volatility and plan for long-term fiscal health. The adoption of green fiscal policies can support RRCs in navigating the challenges of decarbonization, contributing to both fiscal sustainability and sustainable development goals. Additionally, decarbonization affects various economic aspects, including budget revenues, expenditures, and the overall fiscal sustainability landscape, necessitating tailored fiscal policies. This comprehensive analysis provides valuable insights into designing and implementing fiscal policies suited to the needs of resource-rich countries during the global energy transition. The study highlights how green fiscal policies can assist RRCs in managing decarbonization challenges while achieving sustainable development goals.*

***Keywords:** decarbonization, fiscal policy, resource-rich countries, public finance, green fiscal policies.*

INTRODUCTION

Achieving the target of keeping global temperature increases below 2°C, ideally stay within a 1.5°C limit, requires a profound transformation across various sectors, including energy, industry, transportation, and agriculture. This urgent need for action was emphasized with the adoption of the Paris Agreement in December 2015, indicating a collective global effort to address climate change. However, international efforts to combat climate change remain mainly insufficient, and pose fiscal risks on public finances. The global temperature levels are expected to increase by more than 1.5°C above pre-industrial levels over the next five years, according to the latest data from the World Meteorological Organization (WMO, 2023). According to the "Global Risks-2024" report of the Davos Economic Forum published in January of 2024, "Extreme weather events", "Loss of biodiversity and destruction of the ecosystem" and "Lack of natural resources" are among the main risks in the long term (World Economic Forum, 2024). These risks emphasize the critical necessity for coordinated global efforts to tackle climate change and its related impacts.

Furthermore, fossil fuels, including crude oil, natural gas, and coal are the primary source of anthropogenic greenhouse gas emissions, and continue to dominate global energy supply. The resource-rich countries are the major contributors to global emissions on a per capita basis due to extraction, processing, and exports, and sometimes inefficient energy systems used by industry and housing. These countries as a whole represent almost 30.0 percent of the global population, 15.0 percent of world’s gross domestic product, and 20.0 percent of global greenhouse gas emissions. Even a 50 percent probability of limiting warming to 1.5°C, nearly 60 percent of proven reserves for oil and natural gas and 90 percent for coal must remain unextracted (Welsby, et al., 2021). Considering the decarbonization is important, resource-rich countries face unique challenges on designing their fiscal policy frameworks, requiring significant adjustments. During the 2017-22 period, the net export of fossil fuels on average represented a significant portion of GDP in various countries: 40.3 percent in Libya, 39.2 percent in Equatorial Guinea, 37.3 percent in Qatar, 36.0 percent in Kuwait, and 35.5 percent in Azerbaijan (Figure 1).

Figure 1.

Net export of fossil fuels (percent of GDP) by fossil fuel producer (Average 2017-2022)

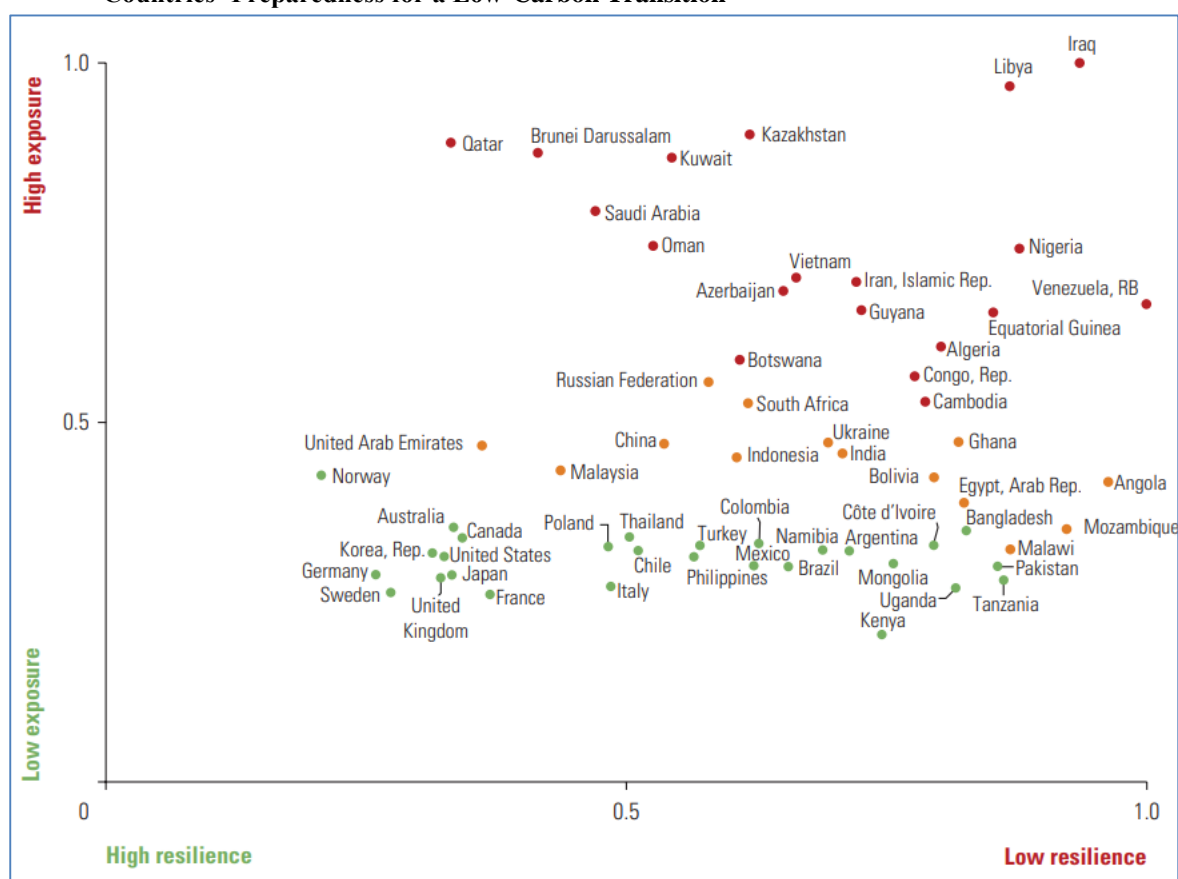
Rank	Country	All Fuels	Crude Oil	Natural Gas	Coal
1	Libya	40,3	35,2	5,2	-0,01
2	Equatorial Guinea	39,2	28,1	11,1	0,00
3	Qatar	37,3	13,0	24,3	-0,01
4	Kuwait	36,0	33,5	2,5	-0,03
5	Azerbaijan	35,5	28,7	6,7	0,00
6	Angola	34,9	32,2	2,7	-0,01
7	Iraq	33,2	33,7	-0,4	-0,01
8	Brunei Darussalam	32,9	10,6	22,7	-0,49
9	United Arab Emirates	32,6	29,1	3,5	-0,04
10	South Sudan	31,1	31,1	0,0	0,00
11	Republic of Congo	30,6	30,5	0,2	-0,09
12	Oman	23,1	16,6	6,6	-0,03
13	Saudi Arabia	22,1	21,4	0,7	-0,01
14	Gabon	20,7	20,5	0,2	-0,02
15	Algeria	20,3	10,2	10,1	-0,06
16	Kazakhstan	19,1	17,9	1,1	0,11
17	Norway	18,1	7,9	10,1	-0,06
18	Mongolia	14,8	-5,8	-0,2	22,5
19	Turkmenistan	14,3	1,6	12,4	0,20
20	Chad	14,1	14,1	0,0	0,00
21	Venezuela	13,2	13,2	-0,1	0,03
22	Trinidad and Tobago	13,0	3,2	10,0	-0,08
23	Russian Federation	12,3	10,5	0,6	1,12
24	Papua New Guinea	12,1	2,1	10,0	0,00
25	Iran	11,9	10,3	1,5	0,02
26	Bahrain	9,5	8,9	N/A	0,00
27	Nigeria	8,7	7,1	1,6	0,00
28	Ghana	5,8	5,8	0,0	-0,04
29	Colombia	5,6	3,4	-0,1	2,30
30	Canada	4,1	3,2	0,5	0,30

Sources: IMF, World Economic Outlook database; UNCTAD; IMF staff calculations.

FISCAL POLICY FRAMEWORK IN A DECARBONIZED FUTURE FOR RESOURCE-RICH COUNTRIES

In Angola, the net export of fossil fuels represented 34.9 percent of GDP in 2017-2022. Moving forward, countries like Iraq, Brunei, the United Arab Emirates, South Sudan, and Congo was estimated to have more than 30 percent of GDP from fossil fuel exports during the same period. In addition, the World Bank analyzes countries' preparedness levels for a low-carbon transition using a composite indicator. (Figure 2). The Gulf countries and Russia are on the borderline, frequently facing similar levels of exposure but enjoying greater resilience due to the complexity of their economies. This indicator highlights the more vulnerable RRCs that have not yet diversified their economy towards low-carbon growth. These RRCs are small oil-gas producers in Middle East, the North Africa, sub-Saharan Africa, and Latin America (Peszko, and Grzegorz, 2020). In addition, poverty and ongoing conflicts are among the most significant challenges making countries more vulnerable to climate change.

Figure 2.
Countries' Preparedness for a Low-Carbon Transition



Source: Diversification and Cooperation in a Decarbonizing World (World Bank, 2020, p.57)

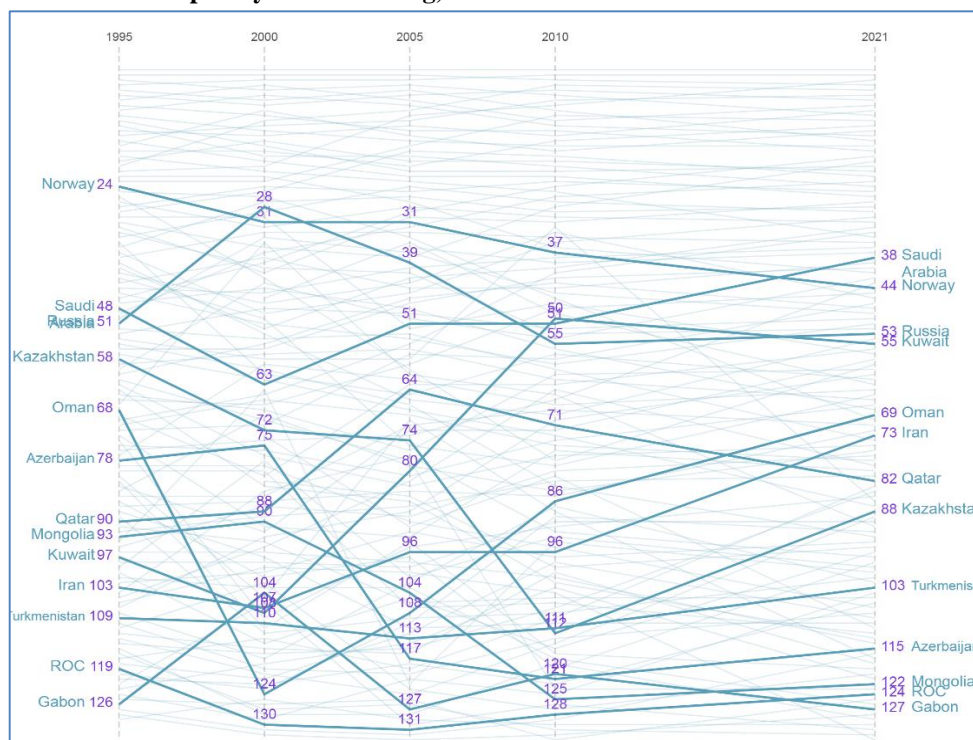
The least prepared countries, such as Iraq and Libya, are particularly vulnerable to external shocks from the decarbonization process, due to long-term conflicts have destroyed all non-oil tradable industries and already weak institutions. Due to their poor governance, Equatorial Guinea, Nigeria, and the Venezuela are the least resilient and most exposed countries. Azerbaijan, Botswana, and Kazakhstan share high exposure and relatively weak resilience. On the other hand, Norway is well-equipped for decarbonization due to its resilience, particularly its diversity, economic flexibility, and high quality of human capital and

institutions. In contrast, some less prepared countries, like Angola, are less exposed than Norway.

Another significant determinant of the resilience for resource-rich countries to decarbonization is their complexity and economic performance. Countries with high levels of economic complexity, high-income growth are better prepared to new capacities in anticipation of decline in demands for fossil fuels and carbon-intensive products and services.

The Economic Complexity Index (ECI) measures the diversity and prevalence of a country's exports. ECI scores show that Mongolia, Venezuela, Nigeria, and Congo perform particularly poorly and may struggle to create new capabilities in their economies compared to other RRCs. Russia and Kuwait, ranking 53rd and 55th respectively, are good performers in the ECI index among the RRCs out of 133 countries listed in the Harvard Atlas of Economic Complexity. Interestingly, Saudi Arabia, ranked 38th, holds a better position than Norway, which remains at 44th place. The low-ranking countries show potential challenges in diversification and innovation, indicating lower resilience to decarbonization compared to other RRCs. Gabon, the Republic of Congo, Mongolia, and Azerbaijan have low ECI scores. This low ranking suggests that these RRCs may face challenges in adapting to the decarbonization process due to their fossil fuel-focused economies.

Figure 3.
Economic Complexity Index ranking, 1995-2021



Source: The growth Lab at Harvard University 2021

Uncertainties related policy actions in the rest of the world, consumption choices in developing countries, and technological advancements complicate decision-making for the resource-rich countries when establishing a comprehensive strategy. Robust transition risk management strategies towards sustainable growth calls for RRCs to implement two main strategies.

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Historically, diversification efforts in resource-rich countries have traditionally focused on shifting down the value chain towards energy-intensive and polluting industries. This involves diversifying outputs and exports through energy or carbon-intensive industrialization related to fossil fuels. This approach has generated short-term export revenues and helped in managing volatility in energy prices. However, this approach has also heightened their dependency on carbon-intensive economic activities, thereby increasing their vulnerability to the global low-carbon transition.

Another pathway for diversification is to promote a more extensive diversification of wealth (assets), which can lead to the development of productive and competitive economies that are also adaptable and resilient in a decarbonizing world. This relies on knowledge and efficiency, which enhance productivity over time and diversify the portfolio of national assets (inputs), including natural capital and intangible assets such as knowledge, innovation, and institutions. Fossil fuel depended countries should diversify their portfolio to include a broader range of produced, human, and natural capital. This can be achieved by increasing investments in education and innovation, ecosystem services, and enhancing their social capital and institutional capacity.

This involves prioritizing investing in education sector and innovation to foster a proficient workforce able to stimulate diversified economic growth. Additionally, improving ecosystem services through restoration efforts can mitigate environmental decline while promoting sustainable development. Moreover, strengthening social capital and institutional capacity is crucial for fostering inclusive governance systems that enable efficient resource management and fair distribution of advantages. By collectively focusing on these aspects, fossil fuel-dependent countries can navigate the transition towards a more varied and sustainable future.

Additionally, diversification can occur through climate cooperation. Diversification alone is unlikely to trigger a low-carbon transition. Moreover, climate initiatives in net fuel-importing nations might result in what is known as "dirty" diversification, where emission-intensive industries relocate to resource-rich countries. In order to transition the global economy to a low-carbon model, resource-rich countries must implement domestic climate policies. These policies would aid in diversifying assets and promoting economic diversification, while also shielding RRCs from potential consequences such as border taxes or broader trade sanctions imposed by other nations due to insufficient climate policies. Nonetheless, these policies come with immediate risks, posing challenges for policymakers in terms of justification and implementation.

Possible remedies for this issue encompass innovative collaborative mechanisms, such as wellhead taxes and preferential trade agreements, or broader conditional financial and technology transfers. These strategies have the potential to encourage and streamline climate cooperation among resource-rich countries, facilitating a more comprehensive structural transition compared to a piecemeal, project-focused approach to climate finance.

For both of these strategies, RRCs will need to develop and implement plans that account for a just transition for affected communities particularly in the coal-dependent regions who will be the first affected by a low carbon transition, including through re-training, re-tooling and targeted social protection (International Labour Organization, 2015).

Fiscal Impact of Decarbonization and Climate Change

Managing the impact of decarbonization on fiscal sustainability will be one of the most serious concerns facing resource-rich countries in the future decades. Currently, the growing production of energy from renewable sources and the global expansion of electrification in both public and private transportation are anticipated to reduce the demand for commodities. As alternative technologies become more affordable and actions to address climate change intensify in accordance with the Paris Agreement, the demand for hydrocarbons is expected to decrease significantly. Renewable energy sources are expected to play a greater role in electricity production, and the transition to electromobility and increased reliance on electricity in various sectors will significantly reduce the demand for hydrocarbons. The International Renewable Energy Agency (IRENA) and the International Energy Agency (IEA) report that renewable energy has become more affordable than fossil fuels, and three-quarters of all new electricity production capacity is renewable globally (IRENA, 2024). Many countries are increasing the sale of electric vehicles while proposing a ban on the sale of diesel and gasoline vehicles in the relatively near future.

From a public finance perspective, uncertainty regarding future oil-gas demand poses major fiscal risks, as many countries rely on production and export of hydrocarbon resources. The fiscal consequences of decarbonization have a significant impact on countries' budget balances, resulting in decreasing fiscal income and increased public spending (Ossowski, Rolando & Havard Halland, 2016). To improve fiscal risk management in the face of such challenges, the RRCs must strengthen its fiscal strategy and tools.

The impact of decarbonization on hydrocarbon export revenues often translate into fluctuations in budget revenues derived from state-owned enterprises and private companies, both domestic and international. These revenues encompass dividends, royalties, production sharing, and tax payments, where applicable. The potential effects of decarbonization on public finance can occur in various ways.

Broad Tax Base and Spending Composition. Decarbonization effects on hydrocarbon revenues can lead to broader implications for the tax base and government expenditure. Apart from directly affecting the budget revenues, the changes can impact various aspects of taxation and public expenditure. For example, a decrease in hydrocarbon revenues might push governments to consider their spending priorities, potentially redistributing spendings. This reallocation could affect crucial sectors like infrastructure development, social welfare programs, or educational initiatives.

Moreover, the interaction between hydrocarbon revenues and government spending can impact economic stability and long-term viability. Governments may face challenges if excessively dependent on volatile hydrocarbon revenues to public finance essential services and infrastructure projects. A sudden decline in revenues could result in budget deficits, increased debt, all of which can hinder economic growth and social cohesion. In RRCs, a decrease in hydrocarbon revenues could precipitate economic downturns, unemployment, and social unrest, underscoring the link between hydrocarbon exports and broader macroeconomic stability.

Increasing Spending. The decarbonization might necessitate increased spending on certain areas. The process may lead to job losses and economic dislocation for workers in

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affected industries. To mitigate the social impacts of these changes, governments may need to expand spending on social safety nets and support programs. This could include unemployment benefits, job training programs, healthcare coverage, and assistance for displaced workers to transition to new employment opportunities.

As countries navigate the decarbonization, state-owned enterprises focuses on fossil fuel-related activities may face important challenges. In order to address these challenges, financial support may be required for SOEs in several key areas. This assistance focuses a lot of initiatives, such as investments in research to explore alternative energy sources, expansion into renewable energy initiatives, and the implementation of more sustainable business practices. Furthermore, allocating spending for infrastructure aimed at meeting environmental standards and helping the decarbonization to cleaner energy sources is important. Moreover, the applying of workforce transition projects and retraining initiatives is significant to aim employees impacted by the evolving landscape of the industry. In such case, targeted financial support serves as a cornerstone in empowering SOEs to navigate shifting market dynamics and contribute meaningfully to the achievning decarbonization goals.

Government Guarantees and Debt: When state-owned enterprises face financial challenges during the decarbonization process, governments might provide guarantees on their debt, either implicitly or explicitly. While the guarantes can give struggling SOEs stability, they also pose serious risks to public finances.

If the SOEs default or experience financial trouble, the responsibility of the guarantes falls on the public finance. This could lead to high levels of public debt. In addition, implicit guarantees, even if not officially stated, can create market distortions among state-owned enterprises.

In order to mitigate these risks, governments need to evaluate the financial health of the SOEs receiving guarantees and set clear standards for providing such support. Transparency and accountability in managing public finances are crucial. To help minimizing the impact on government finances while facilitating a smooth transition to a sustainable economy is important.

Decarbonization and the Role of Fiscal Policy Framework

Maintaining fiscal discipline to ensure macroeconomic stability may become even more challenging in a decarbonized future. The global decarbonization could affect various aspects of resource-rich countries' economies, including hydrocarbon export incomes and investments, which directly affect budget revenues, as well as the hydrocarbon industry, with its spillover effects on other sectors of the economy. Additionally, decarbonization may have implications for inflation rates and the stability of the financial sector.

Consequently, it is important to prioritize fiscal discipline measures in upcoming period. Experience during previous oil price drops have shown that policy responses are typically procyclical by necessity, with reductions in public expenditure that can hinder long-term growth (IMF, 2015).

The procyclical fiscal policy may drive inflation and weaken competitiveness during periods of high revenues, while conversely leading to economic downturns when budget revenues decrease and decreasing spending are important to uphold fiscal sustainability. Many

commodity exporters revise or recalibrate their fiscal rules during the collapse in commodity prices. Looking ahead, the prospect of permanently reduced fossil fuel revenues may raise concerns regarding the government's capacity to sustain specific levels of public infrastructure, wage expenditures, social welfare programs, and more broadly, debt sustainability, and balance sheet vulnerabilities. The fiscal policy should be tailored to particular circumstances of each country. Implementing a medium-term fiscal framework supported by fiscal rules is crucial in this regard.

Decarbonization affects the fiscal policies of RRCs, particularly regarding the alignment of fiscal sustainability with sustainable development goals. An assessment of the importance of fiscal discipline, medium-term budget frameworks, and green fiscal policies in guiding RRCs toward a decarbonized path.

Furthermore, potential impacts of decarbonization on different sectors of the economy, including budget revenues, expenditures, and overall fiscal sustainability are important for implementing fiscal policies tailored to the needs of resource-rich nations amidst the global energy transition. Additionally, adoption of green fiscal policies can help these countries address the challenges of decarbonization while advancing their sustainable development goals.

By exploring the connection between fiscal resilience and decarbonization, strong and credible fiscal frameworks are crucial for resource-rich countries as they navigate the transition towards a greener and more sustainable future.

Stabilising public finance by establishing realistic fiscal targets will accelerate green growth. Without fiscal sustainability, achieving the sustainable development goals during future decarbonization is not achievable. Next-generation fiscal rules should be designed and aimed to strike a better balance between sustainability and flexibility, as well as decarbonization goals. The immediate action should focus on achieving sustainable fiscal targets, such as the non-resource fiscal balance as a share of non-resource GDP, and identifying the sources of financing to smooth the transition process, where possible.

The fiscal rule targets should consider not only short-term constraints, such as the size of the financing gap, but also longer-term objectives. Resource-rich countries are different, encompassing both high and low-income countries, as well as a range of fiscal positions. The determination of the fiscal rule targets will depend on country-specific elements, including the volatility on hydrocarbon revenues, the adequacy of reserves and fiscal space accordance with fiscal sustainability. To ensure the credibility of fiscal policy, the fiscal rule should integrate well-designed escape clauses for deviations in extraordinary circumstances.

The RRCs can achieve climate goals by maintaining fiscal discipline and implementing green fiscal policy. "Green fiscal policy" encompasses expenditure, revenue, and borrowing policies to promote the government's sustainable development objectives, utilizing fiscal policy tools to achieve environmental and climate-related targets. The climate change initiatives can be directly associated with fiscal policy, mainly through government spending or taxation, and they also have an indirect effect on macroeconomic and fiscal outcomes. On the expenditure side, green public investment, subsidies and transfers focused on climate-related initiatives play a key role at facilitating the decarbonization by promotion of clean energy, encouraging innovation in green technologies, and improving energy efficiency.

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By employing fiscal instruments for environmental objectives, it becomes possible to positively impact price signals and market incentives, thereby directing consumers, producers, and investors towards more sustainable decisions. In terms of revenue generation, significant climate policies, such as the emissions trading system (ETS), carbon taxes, and other environmental taxes (for example, excise taxes on fossil fuels), directly or indirectly establish a price for carbon emissions. Economic theory emphasizes that carbon pricing should be main aspect of effective climate change policy (Raúl Delgado & Huáscar Eguino).

The resource-rich countries should work to align their economies with the goals of the Paris Agreement. To meet the targets, identifying and sharing best practices and common approaches, building expertise, and benefiting RRCs is important. Under this approach, identifying, assessing, and reducing government fiscal risks arising from climate change and decarbonization, and using macroeconomic analysis to integrate climate considerations into fiscal policy, is crucial (OECD, 2020). Additionally, reducing fiscal risks arising from decarbonization and integrating climate into macro-fiscal policy and management for a sustainable and green recovery is essential (Mr. Luc Eyraud, et al, 2023).

Efforts to mitigate and adapt to climate change will have major economic consequences and will affect the fiscal sustainability of government budgets in the medium and long terms. Supporting the development of methods for identifying and managing fiscal risks from decarbonization impacts and the effects of efforts to mitigate them by reducing greenhouse gas emissions is imperative. Using green budgeting, green procurement, and climate-informed public investment management to integrate climate considerations into policymaking and budgeting and drive effective and equitable climate action that can deliver climate policy goals (Coalition of Finance Ministers for Climate Action , 2022).

Around the world, reforms are being carried out in accordance with the demands of the decarbonization, particularly in the field of tax legislation. Important steps are being taken in the direction of attracting green investments and supporting "green financing" initiatives. Implementing green fiscal policies, such as reducing subsidies and using tools like carbon taxes, will be critical to advance any country's decarbonization program.

"Carbon tax" is a payment levied on the volume of carbon emissions in order to ensure the reduction of relevant carbon-based emissions in the atmosphere. Oil products, natural gas, and coal are charged according to their carbon content. The implementation of the carbon tax aims to attract additional funds to revive the economy and bring it to a higher ecological level, while reducing the volume of GHG emissions (Asian Development Bank, 2023). The main goal here is to encourage enterprises to decrease GHG emissions and invest in the application of modern technologies along with paying for environmental damage. This, in turn, is called the "polluter pays" principle. In this case, the damage that may be caused to nature as a result of production activity is compensated.

Environmental tax reforms (such as those carbon taxes) have multiple benefits beyond climate. Carbon taxes can support multiple Sustainable Development Goals (SDGs) in various ways. Firstly, carbon taxes absolutely increase the price of fossil fuels, thereby reducing fossil fuel consumption and aiding in achieving climate goals. Secondly, as a source of tax revenue, carbon taxes can increase budgetary revenues, which can then be utilized for development purposes, such as enhancing spending on health, education, and welfare (UN, 2023).

Carbon taxes can serve as economic incentives for innovation by stimulating the development of green technologies and sustainable practices. Additionally, they encourage businesses to invest in research and development for low-carbon solutions.

Furthermore, carbon taxes can generate revenue for sustainability, such as providing funds for environmental initiatives and renewable energy projects, thereby addressing the dual goals of emission reduction and funding sustainable programs.

Beyond all the advantages mentioned above, there are also disadvantages of carbon taxation. One such disadvantage is its regressive impact on lower-income individuals. There is a risk that carbon taxes may disproportionately affect lower-income individuals, as they often spend a higher percentage of their income on carbon-intensive goods and services. Additionally, competitiveness concerns for industries are a significant issue. Industries subject to carbon taxes may face higher production costs, potentially leading to concerns about competitiveness and the possibility of carbon leakage, where industries relocate to regions with less stringent regulations. Furthermore, considering the complexity of implementation, carbon taxation can be challenging. Designing and implementing an effective carbon tax system requires careful consideration and monitoring to determine the appropriate tax rate and address potential loopholes. Additionally, incomplete coverage and sectoral exemptions can also be disadvantages. The effectiveness of carbon taxes may be compromised if they do not cover all sectors or if certain industries are granted exemptions, potentially limiting their overall impact on emissions reduction.

DISCUSSION/CONCLUSION

As countries transition towards decarbonization, policymakers will need to carefully balance environmental goals with economic considerations. Assisting in mobilizing the financial resources to implement national climate action plans in RRCs, climate budgeting applications, as well as addressing climate risks and vulnerabilities is important to ensure climate resilience. The RRCs can achieve climate goals by maintaining fiscal discipline and implementing green fiscal policy.

The transition to sustainable development requires funding beyond governments' financial capacity. Public finances are important in spurring private investment consistent with climate goals. Stabilising public finance by establishing realistic fiscal targets will accelerate green growth. Without fiscal sustainability, achieving the sustainable development goals during future decarbonization is not achievable. Implementing carbon pricing mechanism and investing in renewable energy can help mitigate the economic impacts of decarbonization. Investing in climate initiatives not only brings about climate benefits such as helping achieve Nationally Determined Contributions (NDCs) and mitigating climate-related risks, migration, and disease but also environmental benefits, including cleaner air and water quality, and safer and less congested roads.

Governments can promote the use of green bonds by leveraging the growing interest of capital markets in sustainable projects. In addition, ministries of finance can support the development of fiscal policy framework with their implementation of carbon taxes. Moreover, fostering global cooperation and partnerships will be essential to address worldwide challenges related climate change. Governments might also necessitate to provide targeted support and

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incentives for industries and communities heavily reliant on fossil fuels to facilitate a just transition. In addition, to facilitate the process, it is important to ensure macroeconomic stability and improve governance and the business climate. This involves planning public investments, and structural reforms to facilitate private investment. Overall, specific and coordinated efforts will be important to ensure sustainable and a smooth transition to a decarbonized future.

While this study provides a comprehensive analysis, one of its strengths is its detailed exploration of fiscal policies tailored to RRCs. However, a potential weakness is the variability of regional contexts, which may limit the generalizability of the findings. Additionally, further research is needed to explore alternative explanations and practical implications of fiscal policies in different economic and political environments.

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ANALYZING AND FORECASTING CO₂ EMISSIONS IN THE ALUMINUM SECTOR USING ARIMA MODEL

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Abstract: *The urgent and pressing challenge posed by global climate change underscores the critical need for immediate and decisive action, particularly in the mitigation of greenhouse gas (GHG) emissions to facilitate a trajectory towards sustainability. The significance of the aluminium industry, characterized by its notable carbon footprint, accentuates the importance of conducting comprehensive and environmentally conscious analyses within this sector. Heightened environmental apprehensions surrounding aluminium production necessitate the development of effective approaches for emission forecast. The primary aim of the article is to elucidate the present situation and future predictions of carbon emissions within the global aluminium industry, particularly in the context of escalating concerns regarding global climate security. The research concluded that there will be a decrease in CO₂ emissions within the aluminium industry in the future as a result. Through meticulous assessments and exhaustive forecasts of CO₂ emissions across the global aluminium industrial chain system, this study employed the Autoregressive Integrated Moving Average (ARIMA) model to scrutinize data spanning from 2005 to 2030. By furnishing valuable insights into prospective emission patterns and providing guidance for the formulation of sustainable policy measures, this research assumes a pivotal role in shaping data-driven strategies aimed at mitigating the environmental impact of aluminum production. Consequently, it contributes significantly to the collective endeavor to combat climate change and foster a more resilient and sustainable future for humanity.*

Keywords: *green economics, aluminum industry, CO₂ emissions, ARIMA model, sustainability.*

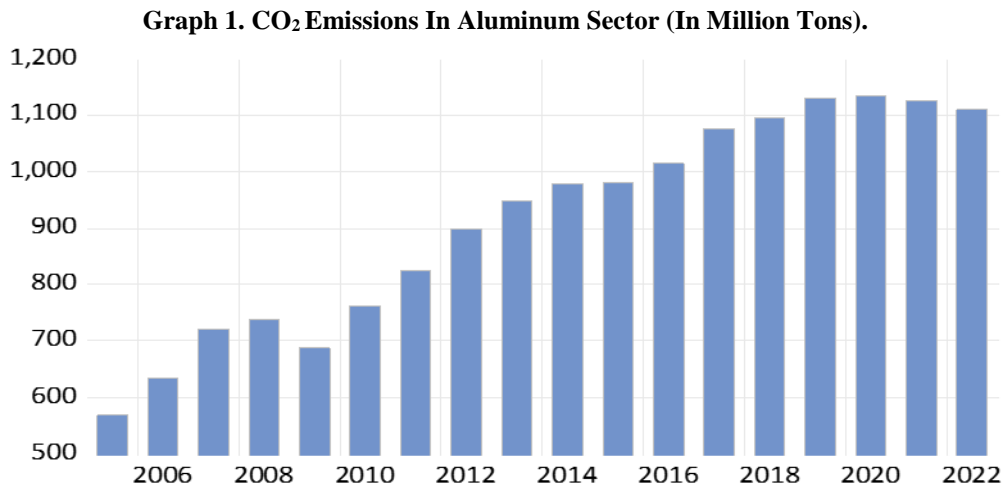
INTRODUCTION

Aluminium plays a vital role in various technologies essential for the energy transition, but it also serves as a significant source of CO₂ emissions, emitting close to 270 million tonnes of direct CO₂ emissions in 2022, which corresponds to approximately 3% of the world's direct industrial CO₂ emissions (IEA, 2023). Despite being consumed in lower quantities compared to steel or cement, aluminum emerges as the most carbon-intensive material per tonne among

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the top three highest-emitting materials (Berker, 2022). These statistics reiterate the fundamental importance of the current sector in promoting a sustainable eco-economic system.

Graph 1 depicts the CO₂ emissions of the global aluminum industry over the past 18 years, revealing a notable shift from an upward trend to a decrease since 2020. Concurrently, there has been observed growth in global aluminum production, indicating a positive trend towards green integration in recent years.



Source: International Aluminum Institution (IAI). <https://international-aluminium.org/statistics/greenhouse-gas-emissions-aluminium-sector/> (25.01.2023)

The global aluminum industry holds considerable economic significance, yet its manufacturing activities contribute significantly to greenhouse gas emissions, particularly carbon dioxide (CO₂). Therefore, understanding the emission patterns within this sector is crucial for implementing effective mitigation strategies. Utilizing some techniques in time series analysis and forecasting, this research aims to examine CO₂ emission data in the global aluminum industry to identify prevailing trends and forecast future emission patterns. By conducting thorough analysis and forecasting modeling, the findings of this study aim to provide insights that can guide strategic decision-making processes geared towards promoting sustainability in the aluminum sector.

LITERATURE REVIEW

Time series forecasting is indispensable across multiple fields, including finance, economics, engineering, and social sciences. ARIMA (Autoregressive Integrated Moving Average) models serve as a cornerstone in statistical time series analysis, offering a flexible and powerful framework for forecasting future values based on past observations. ARIMA models have become a well-established tool within the field of economics for forecasting key macroeconomic indicators. These indicators, such as Gross Domestic Product (GDP), inflation rates, and unemployment levels, provide crucial insights into the health and trajectory of a nation's economy. Vafin (2020) utilized the Automatic ARIMA forecasting method to anticipate significant macroeconomic indicators across seven notable economies, uncovering anticipated reductions in employment and inflation within the United States, alongside diminishing rates of labor force participation in Russia, alongside other forecasted patterns.

Moreover, this model is extensively employed in financial analysis and forecasting. Numerous scientific articles exist that explore this area (Li, Han, & Song, 2020; Ariyo, Adewumi, & Ayo, 2014; Cheng et al, 2020).

In addition to these instances, the ARIMA forecasting model is employed in a multitude of scholarly investigations centered on sustainable economic development and resilience. Using annual time series data from 1960 to 2017 on CO₂ emissions in China, employs Nyoni, & Mutongi (2019) the Box-Jenkins ARIMA approach to model and forecast CO₂ levels, revealing an anticipated increase in emissions and suggesting four key policy recommendations for the Chinese government. Dritsaki, M., & Dritsaki, C. (2020) investigate the most effective model for forecasting CO₂ emissions in the EU-28, utilizing an ARIMA(1,1,1)-ARCH(1) model with parameter optimization via maximum likelihood estimation, employing both static and dynamic methods for forecasting, with the static approach demonstrating superior accuracy in forecasting.

The thorough scientific analysis of carbon dioxide emissions within the global aluminum industry, renowned for its expansive industrial network, holds considerable importance on a global scale. Ciacci et al. (2014) employs Standard Material Flow Analysis (MFA) and Life Cycle Assessment (LCA) models to study the historical greenhouse gas emissions from Italian aluminum production (1960-2009), aiming to guide future industrial and environmental policies. It calculates annual emissions and cradle-to-gate factors, revealing the carbon footprint and highlighting emissions transfers between production and use locations. The study suggests potential emissions reductions through aluminum recycling and underscores the value of integrating MFA and LCA for comprehensive environmental analysis. Liu & Muller (2012) conducted an extensive analysis of aluminum life cycle assessments, taking into account sustainability principles from a wide-ranging perspective.

DATA AND METHODOLOGY

The present study employs data concerning Aluminum Life Cycle Emissions (ALCE), offering insights into carbon CO₂ emissions associated with the worldwide aluminum sector. Spanning from 2005 to 2022, this dataset provides a holistic perspective on emission patterns throughout the specified timeframe. Sourced primarily from the International Aluminium Institute (IAI, 2023) and derived through Total-Cradle to Gate calculations, this dataset serves as a pivotal resource for comprehending the environmental ramifications of aluminum production processes, serving as the cornerstone for subsequent analyses and interpretations within the study.

Table 1 presents the descriptive statistical analysis of CO₂ emissions in the aluminum sector spanning from 2005 to 2022, providing essential insights for environmental and industrial evaluation. The mean annual emission is documented at 913.00 million tons, with a median emission of 964.00 million tons, signifying the central tendency of the data. Additionally, the dataset highlights a range of emissions, with a minimum of 569.00 million tons and a maximum of 1133.00 million tons, alongside a moderate level of variability (SD = 189.25), a slight left skew (skewness = -0.35), and a moderately peaked distribution (kurtosis = 1.74). These findings are instrumental for researchers and policymakers to discern trends and devise sustainable strategies within the aluminum industry.

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Table 1. Descriptive Statistical View (ALCE In Level).

Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
913.00	964.00	1133.00	569.00	189.25	-0.35	1.74

Unit root tests are statistical techniques employed to ascertain the stationarity of a time series variable. A stationary time series variable is characterized by consistent attributes, including a constant mean, variance, and autocorrelation, which remain unchanged over time. The Augmented Dickey-Fuller (ADF) test (1979) evaluates the presence of a unit root, implying non-stationarity, in a time series variable, whereas the Phillips-Perron (PP) test (1988), a comparable unit root examination, incorporates modifications to account for serial correlation and heteroscedasticity. ADF and PP tests are implemented to evaluate the stationarity of the ALCE series. In instances where the data exhibits non-stationarity, indicating alterations in statistical properties over time, differencing techniques are employed to attain stationarity. The correlogram provides a visual representation of the autocorrelation function (ACF) and partial autocorrelation function (PACF) of the ALCE series. This visualization facilitates the identification of serial dependence patterns, indicating correlations between past and present values within the dataset.

The Autoregressive Integrated Moving Average (ARIMA) model serves as a widely employed approach for time series forecasting. This model was established through the pioneering contributions of Box and Jenkins (1970). Their incorporation of differencing into the ARMA framework transformed the ARIMA model, enabling the handling of non-stationary time series data via observation differencing. ARIMA model is defined by three parameters, represented as (p, d, q), where p signifies the count of autoregressive terms integrating preceding values, d indicates the degree of differencing essential for achieving stationarity, and q denotes the number of moving average terms accounting for past forecast errors.

In this research endeavor, we examine the utilization of this methodology for forecasting emissions, as articulated by the equation:

$$ALCE_t = \alpha_1 ALCE_{t-1} + \varepsilon_t \quad (1)$$

here:

- $ALCE_t$ is the CO₂ emissions in aluminum sector in period t.
- $ALCE_{t-1}$ is CO₂ emissions in the aluminum sector during the preceding period.
- ε_t represents the error term, assumed to be white noise, characterized by being independent and identically distributed with a mean of zero.

The selection of the most suitable ARIMA model relies on statistical metrics such as p-values, R-squared, Akaike Information Criterion (AIC), and Schwarz Bayesian Criterion (SBC), which penalize excessive model complexity in favor of simpler alternatives demonstrating enhanced forecasting precision.

For a more dependable forecasting analysis of the model, it is imperative to obtain the AR and MA roots results. These outcomes offer critical information about the stability and characteristics of the autoregressive (AR) and moving average (MA) components, thereby augmenting the accuracy and reliability of the forecasting process.

RESULTS

Table 2 displays the results from two unit root examinations, specifically ADF and PP tests, which are conducted assuming the presence of both trend and intercept in the data. The p-values presented in the table serve the purpose of determining whether the null hypothesis of a unit root can be rejected. Upon the first difference operation, where the data undergoes differencing once, the test statistic yields a value of -3.262 with a corresponding p-value of 0.107. Despite this p-value being lower compared to the initial level, it does not attain sufficient significance to reject the null hypothesis at the conventional 5% significance level. However, its proximity to the threshold suggests the consideration of either a test with improved power or a decreased significance level. Conversely, at the second difference, the test statistic stands at -4.718 with a p-value of 0.010, denoting statistical significance. This finding implies the potential attainment of stationarity in ALCE subsequent to two difference operations. The outcomes of the Phillips-Perron test closely mirror those of the ADF test, displaying insignificance at the initial level and first difference, but significance at the second difference, hinting at the likelihood of achieving stationarity after two differences.

Table 1. Unit Root Test: ALCE.

Augmented Dickey-Fuller		Level	1st Difference	2nd Difference
Trend and Intercept	t-statistic	-1.075	-3.262	-4.718
	p-value	0.903	0.107	0.010
Phillips-Perron		Level	1st Difference	2nd Difference
Trend and Intercept	t-statistic	-1.308	-3.284	-6.586
	p-value	0.849	0.104	0.000

The correlogram provided in Graph 2 illustrates the autocorrelation coefficients for ALCE across various lag intervals, spanning up to 12 lags, where the vertical axis denotes these coefficients and the horizontal axis represents lag duration. Additionally, the correlogram incorporates partial autocorrelation coefficients (PAC), which reveal correlation patterns after adjusting for intervening lags. Notably, the prominently elevated and positive first lag autocorrelation coefficient indicates a persistent influence of CO₂ emissions, while diminishing coefficients suggest decreasing correlations with extended lag durations. Multiple coefficients, demonstrating statistical significance, suggest the presence of serial dependence, while other observed patterns hint at potential non-stationarity. Leveraging the correlogram facilitates the identification of appropriate ARIMA models for diagnostic purposes.

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Graph 2. The Correlogram Of ALCE.

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	0.837	0.837	14.840	0.000
		2	0.671	-0.100	24.969	0.000
		3	0.537	0.009	31.888	0.000
		4	0.397	-0.112	35.937	0.000
		5	0.210	-0.252	37.153	0.000
		6	0.042	-0.085	37.206	0.000
		7	-0.101	-0.099	37.539	0.000
		8	-0.212	-0.032	39.150	0.000
		9	-0.297	-0.030	42.688	0.000
		10	-0.363	-0.067	48.608	0.000
		11	-0.417	-0.104	57.572	0.000
		12	-0.437	-0.037	69.033	0.000

**Derived through the utilization of the Eviews software application*

Several scholars (Ning, Pei, & Li, 2021; Sharma et al., 2023; Lotfalipour, Falahi, & Bastam, 2013) have applied the ARIMA forecasting model to analyze carbon dioxide (CO₂) emissions, as evidenced by a body of research in the field. Based on the findings presented in Table 4, we examine the suitability of employing AR(1)MA(1) models for the analysis and forecasting of time series data. The AR(1) model characterizes a time series wherein the current value exhibits a linear dependence on the previous value (lag 1), while the MA(1) model captures the relationship between the current value and the preceding error term (lag 1). In contrast, AR(1) employs lagged outcome values for forecasting, while MA(1) utilizes unobserved error terms as inputs, leading to distinct methodologies and estimation outcomes. Through comparison and diagnostic evaluation, encompassing measures such as R-squared and Hannan-Quinn criteria, it is evident that the AR(1)MA(1) model proves to be more suitable.

We conduct estimation for the equation below to identify a prospective model suitable for forecasting, ultimately culminating in the generation of forecasts:

$$ALCE = C(1) + AR(1) * C(2) + MA(1) * C(3) + UNCOND \quad (2)$$

ALCE refers to carbon emissions in the aluminum sector, with C(1), C(2), and C(3) denoting the coefficients associated with the constant, autoregressive (AR), and moving average (MA) components, respectively. UNCOND signifies unconditional estimation.

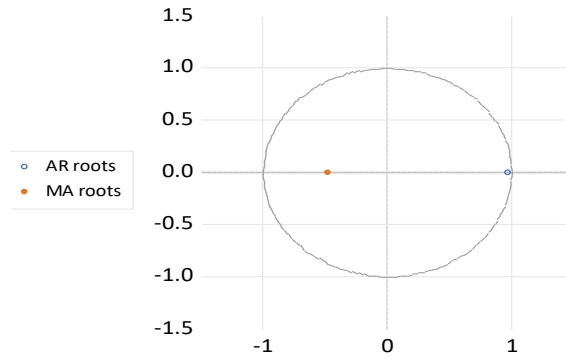
Table 3. ARMA Maximum Likelihood Method Results.

	AR(1)MA(1)	AR(1)MA(2)	AR(2)MA(1)
R-squared	0.948	0.933	0.930
F-statistic	85.232	65.107	62.826
Akaike criter.	10.965	11.198	11.226
Schwarz criter.	11.163	11.396	11.424
Hannan-Quinn criter.	10.992	11.226	11.253

Graph 3 illustrates the roots of the AR and MA polynomials within the ARIMA model framework. The positioning of AR roots is crucial for determining the stability of the AR

component, which is confirmed when all roots lie within the unit circle. Similarly, the placement of MA roots plays a significant role in model stability, with invertibility being essential for precise estimation and interpretation. The stability of the ARIMA model is essential for analyzing ALCE data, emphasizing the importance of thorough validation of model assumptions and meticulous interpretation of results to support informed decision-making in environmental science and policy domains.

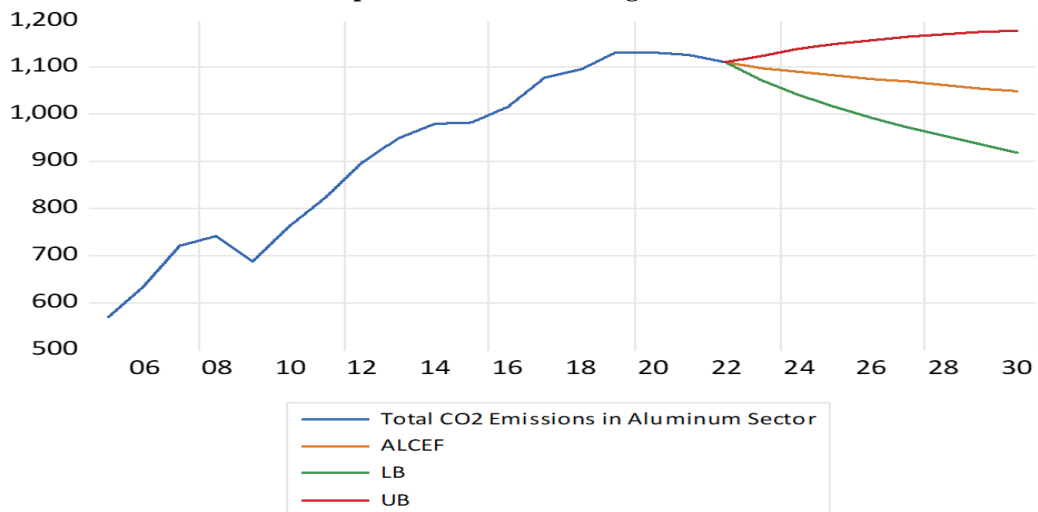
Graph 3. ALCE: Inverse Roots of AR/MA Polynomial(s).



**Derived through the utilization of the Eviews software application.*

The graphical depiction in Graph 4 presents historical ALCE data and projections from 2006 to 2030, with actual emissions depicted by the blue line and forecasted emissions by the orange line (ALCEF), alongside uncertainty boundaries indicated by the green (LB) and red (UB) lines. Historically, ALCE demonstrated a consistent upward trajectory until around 2022, indicative of industrial influences. However, post-2022 forecasts anticipate a decline in ALCE, potentially influenced by environmental regulations and technological advancements. It is forecasted that if the trajectory persists according to the present trend, by 2030, notwithstanding the augmentation in yearly production and consumption, there will be a 6% decrease in CO₂ emissions compared to the levels observed in 2022.

Graph 4. ALCE: Forecasting.



**Derived through the utilization of the Eviews software application.*

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The presence of uncertainty bounds emphasizes the need for cautious policymaking and adaptive measures within the industry. These projections have implications for environmental sustainability, policy development, and industrial strategies, underscoring the importance of vigilance and adaptation in achieving emission reduction goals within the aluminum sector.

DISCUSSION

Mathematical forecasting offers a means to approximate future outcomes based on current trends, although exact figures may not always be attainable within this approach. Furthermore, various factors beyond mathematical models can significantly impact the socio-economic landscape. Based on the CRU report, there is a forecasted surge in demand for aluminum, projected to rise by 40% by the year 2030 (Alfed, 2022).

In the absence of significant technological advancements, the anticipated surge in aluminum demand is expected to necessitate a substantial boost in production, consequently leading to a parallel rise in carbon emissions. The majority of carbon emissions are typically released during the energy production phase. The life-cycle greenhouse gas emissions linked to one metric ton of primary aluminum are estimated to be approximately 14.7 tons of CO₂-equivalent (Peng, Ou, Yan, & Wang, 2019). Transitioning to renewable energy sources such as solar, wind, and hydroelectric power is essential for curtailing CO₂ emissions in the global aluminum industry. This change not only lessens the carbon footprint associated with energy-intensive processes but also fosters sustainability and environmental stewardship within the sector. By investing in renewable energy technologies and embracing eco-friendly practices, aluminum producers can make significant strides in combatting climate change and promoting a greener future for the planet.

Another potential scenario to consider is the implementation of inert anode technology during the aluminum production process. The adoption of inert anode technology represents a substantial stride in mitigating carbon waste during the electrolysis phase, consequently elevating the sustainability credentials of aluminum manufacturing. This breakthrough not only reduces environmental footprint but also enhances resource utilization and operational efficiency across the sector (Hasanov, 2023). The future sustainability of the aluminum industry hinges on two key elements: the evolution of the renewable energy sector and the integration of innovative technologies. These factors are instrumental in guiding the industry toward greater environmental responsibility, facilitating reductions in carbon emissions, and fostering a more sustainable approach to aluminum production.

CONCLUSIONS

This research utilized ARIMA models to examine and forecast CO₂ emissions within the aluminum sector. Through unit root tests, it was determined that two differencing operations were necessary to achieve data stationarity. Analysis of the correlogram helped identify appropriate ARIMA models, with the AR(1)MA(1) model selected based on diagnostic evaluation criteria. The estimated ARIMA model effectively captured historical CO₂ emission trends and projected emissions up to 2030, revealing an anticipated decrease in emissions after 2022, likely driven by environmental regulations and advancements in technology. Following a thorough diagnostic process, the AR(1)MA(1) model emerged as the most suitable for

forecasting CO₂ emissions. This model attained an R-squared value of 0.948, indicating its capability to explain nearly 95% of the variability in the CO₂ emission data. Additionally, the Hannan-Quinn criterion, a metric assessing model simplicity, favored the AR(1)MA(1) model over alternative specifications. The forecast analysis results indicate that if the current trend persists, there will be a 6% reduction in the volume of CO₂ emitted from the global aluminum sector by the year 2030.

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IMPACT OF INNOVATION ON ECONOMIC GROWTH IN BALKAN COUNTRIES

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Abstract: *Innovation plays a crucial role in the daily activities of economic units and its impact extends to the macroeconomic level as well. After the last pandemic, firms and even nations are aiming to adopt the new reality. They are employing advanced technology to develop innovative products and approaches for customers and markets. This study analyzes the impact of innovation on economic growth in Balkan Countries by using annual data for the period between 2011 and 2022. This study uses the individual pillars of the Global Innovation Index as the explanatory variables of GDP Growth rate. Through a panel data analysis, the findings of the study suggest that creative output and infrastructure have a positive significant effect on the GDP growth rate, while the effect of institutions is negative. The test employed failed to prove any impact of other pillars of innovation on economic growth meaning that the impact of other pillars is still insignificant. The findings of this study may serve policymakers to work on the direction of enhancing the impact of all innovation pillars on the economic growth rate.*

Keywords: *innovation, GDP growth, sustainable development, innovation pillars*

INTRODUCTION

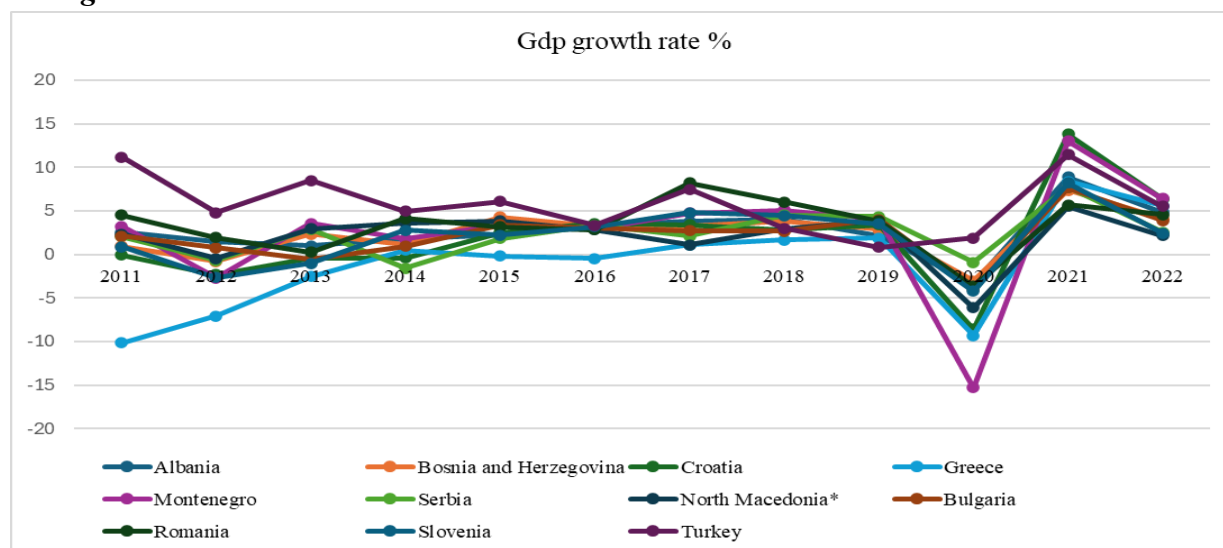
With the fast development of informational technology and the involvement of artificial intelligence in every activity, the competitiveness among regions, countries, industries, firms, and even individuals and professionals has known significant growth. It is difficult to achieve growth and development without the involvement of innovation and innovative processes (Živanović et al. 2023). Operating in a globally dynamic environment and context has shifted the attention of policymakers to the innovation and exploration of new opportunities and economic activities. The governments and monetary authorities seek to achieve a high economic growth rate by focusing on factors that will serve this aim.

All the economic theories emphasize the significance of technological advancement and innovation in increased productivity and economic growth. Adam Smith the most important representative of classical theory, in his book *Wealth of Nations* (Smith, 1776), defines that the determinants of output are the factors of production such as land, labor, and capital. Classical theory highlights the role of technological advancement and innovation as a key driver of the increased productivity of land and labor. Schumpeter (1911) is the first to emphasize the role of innovation and entrepreneurship in economic growth (Ziemnowicz, 2013).

Solow (1956) and Swan (1956) shaped the neoclassical economic growth theory (Dimand, 2009). Based on their model, economic growth is a function of factors of production such as capital, labor, and technology. While acknowledging the limited sources of capital and labor, the authors emphasize technological advancement as the primary driver of economic growth. The endogenous economic growth theory considers technological change as an endogenous factor. (Romer, 1994) highlights that the combination of human capital with knowledge brings innovation which contributes to economic growth by higher productivity.

The purpose of this study is to analyze how innovation has impacted the economic growth in the Balkan region the recent years. Figure 1 gives information regarding the GDP growth rate of Balkan countries as a proxy for economic growth. As seen in the figure, the economic growth of all Balkans except Greece follows the same trend. As an aftermath of the financial crisis, the Greek economic growth had a downtrend, and it reached a value of -10.01% in 2011. In 2020, because of the Covid-19 pandemic crisis, all countries besides Turkey had negative economic growth with the lowest value of -15.3% reached by Montenegro.

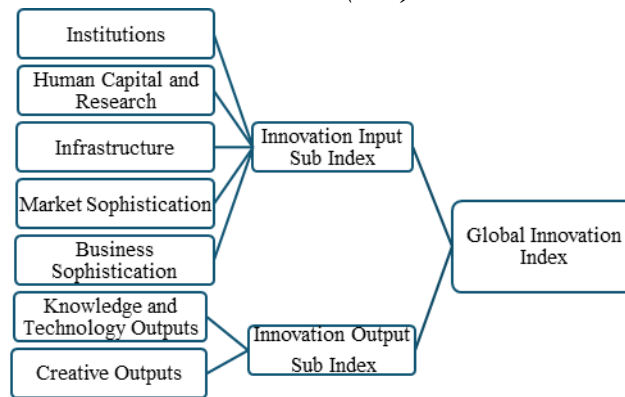
Figure 1.
GDP growth annual %



Source: World Bank Database

This study utilizes the change in the Global Innovation Index (GII), which is measured and published by the World Intellectual Property Organization for 132 nations, as an indicator of innovation. Two sub-indexes constitute the Global Innovation Index. The first sub-index, Innovation Input, measures elements such as institutions, human capital, research, infrastructure, and market sophistication. The second sub-index, Innovation Output, gauges knowledge and technology outputs as well as creative outputs.

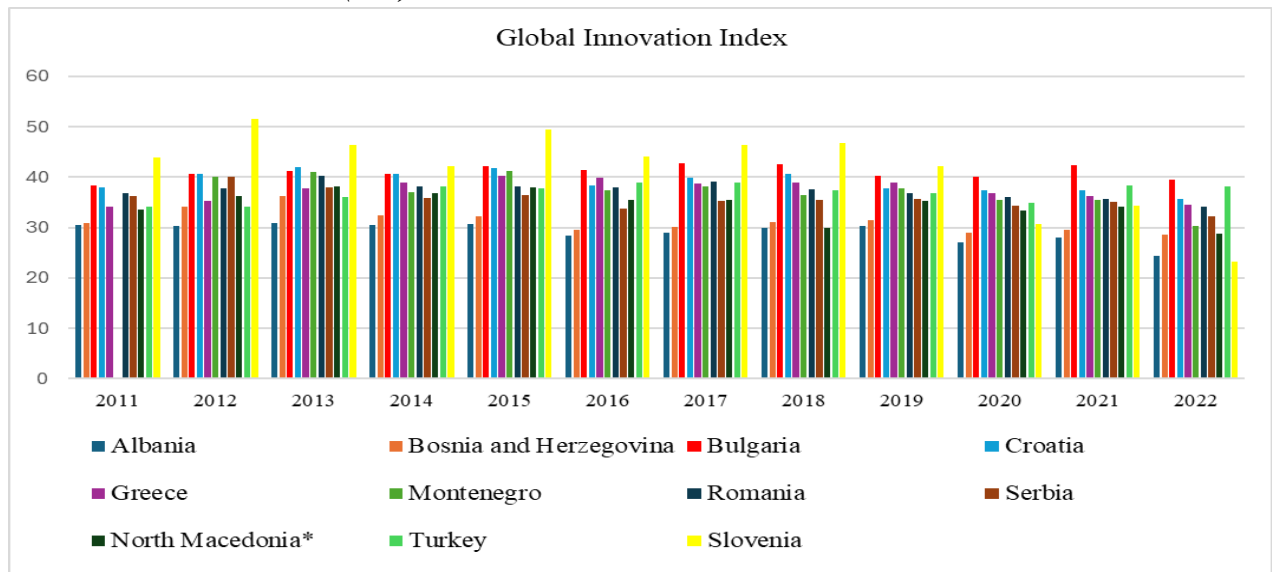
Figure 2
The composition of the Global Innovation Index (GII)



Source: World Intellectual Property Organization

Based on a report published by the World Intellectual Property Organization for 2022, Slovenia has been the leading country to embrace innovation in the region with the highest GII value for many years. In recent years, starting from 2020, Bulgaria has emerged as the most innovative Balkan country, ranking 35th, followed by Turkey and Croatia for 2022.

Figure 3
Global Innovation Index (GII) Value



Source: World Intellectual Property Organization

(Cvetanovic et al, 2014; Despotovic et al, 2014) investigate the level of innovation and the relationship between innovation and competitiveness for a group of chosen Western Balkans and European Union countries. The authors find that EU countries' level of innovation is higher compared to Western Balkan countries. There is no evidence of a relationship between innovation and competitiveness in Western Balkan, while there is a strong correlation in EU countries. Although macroeconomic factors, monetary and fiscal policies, country competitive advantages, and political risks explain economic growth, this study's focus is the investigation of the role of innovation on economic growth. The next section briefly introduces the existing literature on the research topic, followed by the methodology, main findings, and conclusions.

LITERATURE REVIEW

The growing significance of innovation has heightened the curiosity of researchers and scholars about its impact on growth and development. In their studies spanning from 1989 to 2014, Maradana et al. (2017; 2019) investigate the enduring relationship between innovation and economic growth in the European Economic Area. They reveal the presence of both unidirectional and bidirectional causality relationships between innovation and economic growth. The authors observe that in various countries, this relationship is influenced by diverse indicators of innovation utilized. Kacprzyk & Doryń (2017) make a comparison analysis between the EU's old and new members regarding the role of innovation in economic growth. The authors find that growth strategies might be different for different countries, and to strengthen the impact of innovation on economic growth, governments should focus on policies that will contribute to innovation.

Nihal et al. (2023) examine the impact of innovation on economic growth in G8 countries. They find that innovation positively affects economic growth in those countries, which is especially significant in the fields of technology and research and development. Sarangi et al. (2022) investigate the causal short-term and unidirectional long-run relationship between innovation and economic growth in G20 countries. They find that this relationship is significant, even though different variables of innovation impact economic growth differently.

Ulku (2004) investigates the role of innovation on GDP per capita from 1981 to 1997. The empirical analysis suggests a positive relationship between innovation and economic growth in both OECD and non-OECD countries. Another study that suggests a positive relationship between innovation and economic growth was conducted by (Pece et al., 2015) The authors employ multiple regression analysis to explore the relationship between economic growth and various innovation variables, including research and development expenses, as well as the number of trademarks and patents, across Central and East European countries.

Dempere et al. (2023) investigate the relationship between innovation, economic growth, and other macroeconomic variables, using the main pillars of the Global Innovation Index as a proxy for innovation. Through a panel data analysis of 120 countries, the authors conclude that innovation positively affects the economy and that all pillars of innovation have a crucial role in the economy. Besides the impact on the economy, innovation has a significant role in recovering the economy from crises and financial distress (Hausman & Johnston, 2014).

(Özdener, 2020) analyzes the impact of innovation on economic development in the Turkish economy from 2006 to 2017. By analyzing the pillars of the Global Innovation Index the authors find a positive impact of innovation on economic development and other macroeconomic variables. Cameron (1996) investigates the role of innovation in economic growth. The study suggests a spillover of innovation from one country to another by emphasizing the importance of each country's effort toward innovation.

METHODOLOGY

This study employs panel data analysis to investigate the role of innovation on economic growth in Balkan countries from 2011 until 2022. The GDP growth rate serves as the dependent variable in this study, which will be explained by the pillars of the Global Innovation Index such as Institutions, Human capital and research, Infrastructure, Market sophistication, Business sophistication, Knowledge and technology outputs, and Creative outputs. The data

utilized are sourced from the databases of the World Bank and the World Intellectual Property Organization, which also publishes the Global Innovation Index.

The hypotheses that are assessed are:

- H1. Institutions positively affect economic growth.
- H2. Human capital and research positively affect economic growth.
- H3. Infrastructure positively affects economic growth.
- H4. Market sophistication positively affects economic growth.
- H5. Business sophistication positively affects economic growth.
- H6. Knowledge and technology outputs positively affect economic growth.
- H7. Creative outputs positively affect economic growth.

Preliminary tests are conducted to ensure that ordinary least square estimates yield optimal and unbiased results. The stationarity of the series is assessed using the Philips Perron test. The test indicates that series such as GDP growth rate, human capital and research, infrastructure, institutions, knowledge and technology market sophistication and business sophistication are stationary at level, while the creative outputs variable is stationary at the first difference.

Table 1
Series stationarity estimation.

Variable	Philips-Perron	Probability	Order of cointegration
GDP Growth rate	101.42	0.000	I(0)
Business Sophistication	128.53	0.000	I(1)
Creative Outputs	102.26	0.000	I(1)
Human Capital and Research	73.07	0.000	I(0)
Infrastructure	69.48	0.000	I(0)
Institutions	34.99	0.039	I(0)
Knowledge and Technology	49.12	0.000	I(0)
Market Sophistication	36.81	0.025	I(0)

Source: Author | E-views 10

Multicollinearity analysis is utilized to demonstrate the absence of correlation among explanatory variables, ensuring unbiased results.

Table 2
Correlation Matrix

Variables	LBS	LCO	LHC_R	LINF	LINS	LKN_T	LMS
LBS	1						
LCO	0.538	1					
LHC_R	0.454	0.427	1				
LINF	0.089	0.025	0.042	1			
LINS	0.391	0.380	0.259	0.217	1		
LKN_T	0.545	0.472	0.380	0.231	0.256	1	
LMS	-0.261	-0.001	-0.138	-0.112	0.098	-0.194	1

Source: Author | E-views 10

As the values are lower than 80%, the correlation matrix indicates that the independent variables are not correlated to each other, thus the no correlation assumption is satisfied.

The Hausman test is utilized to determine the appropriateness of either a fixed effect or random effect model for the panel data analysis. Based on the results of this test, a random effect model will be used.

Table 3

Hausman Test

Hausman test	Coefficients
Chi-Sq. Statistic	7.956012
Prob.	0.3365
Degree of freedom	7

Source: Author | E-views 10

Zero conditional mean is another important assumption. Based on the results of the test it is noticed that the mean value of error residuals equals 3.74E-15. A further step is analyzing the correlation between the error term residuals and explanatory variables. As shown in table 4 the correlation coefficients are remarkably close to zero. Both results indicate that the zero conditional mean assumption is satisfied.

Table 4

Correlation matrix of residuals

Variables	RESID01
LBS	-5.093e-14
LCO	-0.0244828
LHC_R	1.129e-14
LINF	-7.673e-14
LINS	-2.183e-16
LKN_T	-2.899e-14
LMS	5.428e-14

Source: Author | E-views 10

The two last assumptions that should be satisfied are independence of error terms which is related to the lack of serial correlation and a constant variance of residuals for all levels of independent variables, known as homoskedasticity.

Table 5

Heteroskedasticity - Breusch-Pagan Test.

Depended variable	Resid01^2			
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.472601	0.878759	6.227645	0.0000
GDP	-3.979918	0.171216	-23.24496	0.0000
GDP^2	0.827515	0.019193	43.11569	0.0000

Source: Author | E-views 10

Based on the results of the heteroskedasticity test, as both the probabilities of the dependent variable and the square of dependent variables are zero, the homoskedasticity assumption is not satisfied.

Table 6
Serial Correlation Durbin-Watson Test.

Depended variable	Resid01			
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.177068	0.303211	0.583976	0.5605
AR(1)	-0.169178	0.091089	-1.857282	0.0660

Source: Author | E-views 10

The results of the test indicate that as the probability of AR (1) is higher than 5%, the regression is free of serial correlation. As a result, only the homoskedasticity assumption is violated thus it is necessary to use a model that adjusts the standard errors of coefficients to address the presence of the heteroskedasticity.

THE RESULTS

According to the Hausman test, the random effect model is deemed suitable for analysis. Equation (1) is the equation estimated, while Table 7 shows the regression estimation output by using the White Diagonal coefficient covariance method.

$$GDP\ Growth\% = \beta_0 + \beta_1 LBS_{it} + \beta_2 LCO_{it} + \beta_3 LHC_R_{it} + \beta_4 LINF_{it} + \beta_5 LINS_{it} + \beta_6 LKN_T_{it} + \beta_7 LMS_{it} + \mu \quad (1)$$

Table 7
Regression estimation output

Dependent Variable: GDP Growth rate %				
Method: Panel EGLS (Cross-section random effects)				
Total panel (unbalanced) observations: 120				
White diagonal standard errors & covariance (d.f. corrected)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
BS	5.402	6.967	0.775	0.4397
D(CO)	13.233	4.689	2.822	0.0056
HC_R	-3.981	3.970	-1.003	0.3182
INF	12.069	4.420	2.730	0.0074
INS	-19.392	8.127	-2.386	0.0187
KN_T	-2.654	3.416	-0.777	0.4389
MS	3.066	5.159	0.594	0.5535
C	14.795	14.588	1.0141	0.3127
R-squared	0.129	Adjusted R-squared	0.0746	
F-statistic	2.371	Prob(F-statistic)	0.0268	

Source: Author | E-views 10

The results of the regression estimation output show that only three variables such as creative outputs, infrastructure, and institution are significant determinants of GDP growth rate in Balkan countries. The impact of creative output and infrastructure is positive, thus the third and seventh hypotheses cannot be rejected. Those results are in line with Özdener (2020), and Dempere et al. (2023), who suggest a positive impact of innovation in economic growth. The impact of institutions is negative so the first hypothesis cannot be accepted. Institutions as a pillar include the political, regulatory, and business environment. Because in Balkan countries the informal economy and corruption still have a significant presence, innovation may not have the desirable impact on economic growth. As the probability value of all other coefficients is higher than 5% none of the other hypotheses can be accepted, suggesting that the role of other pillars of innovation on economic growth is still insignificant and limited.

CONCLUSIONS

This study investigates the impact of innovation on economic growth in Balkan countries from 2011 until 2022 using the Global Innovation Index, its sub-indexes, and pillars as a proxy for innovation. Panel data analysis and a random effect model are employed in the analysis. The findings of the study suggest that creative output and infrastructure have a positive significant effect on the GDP growth rate, while the effect of institutions is negative. The test employed failed to prove any impact of other pillars of innovation on economic growth. Apart from the modest contribution in enriching the existing literature, the findings of this study may serve policymakers to work on the direction of enhancing the impact of all innovation pillars on the economic growth rate.

The main limitation of this study is the brief period considering the annual frequency of data. Another limitation stands on the fact that the subject of this study is the unidirectional relationship between innovation and economic growth, while the bidirectional relationship is significant to be studied as well. Including other variables that affect the economic growth rate, analyzing the effect of corruption in each country, dividing the EU countries from non-EU countries, and making a comparison analysis may be a suggestion for future research.

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TRANSFORMATION OF MANAGERIAL LEADERSHIP QUALITIES UNDER THE INFLUENCE OF BUSINESS DIGITALIZATION

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Abstract: *The paper deals with identifying the directions and content of transformational changes in the leadership qualities of a manager under the influence of business digitalization. The paper aims to formulate and disclose scientific, theoretical, and methodological provisions for changing the qualities of a leader in the era of business digitalization. This study is based on observing how managers' leadership qualities are formed and developed in the context of digitalization at both global and micro levels. Identified are the differences between the characteristics of "traditional" and "digital" leaders based on historical and comparative analysis. A set of "traditional" leadership qualities allows for operational guidance and management of the company's future development based on the extrapolation of existing trends. Moreover, possession of the qualities of digital leaders enables multidimensional strategic management. The findings emphasize the importance of digital leadership at both macro and micro levels. The study shows the transformation of leadership and leadership qualities at different levels of economic management, which complements the existing scientific theories of leadership. To promote digital leadership at the macro level, the government is responsible for introducing digital technologies in administration, providing citizens with convenient tools for accessing administrative services. It was established that Ukraine is among the leading countries introducing digital technologies at the macro level. At the level of business management within companies, leadership in the digital era acquires specific characteristics compared to its traditional forms. In particular, the transition from individual to shared leadership leads to changes in organizational structures and management styles.*

Keywords: *digitalization, digital transformation, traditional leadership, digital leadership, leader, leadership qualities*

INTRODUCTION

Current digitalization processes encompass all business activities, including company management. The digitization technologies that facilitate digital transformation are driving organizations towards new ways of working. (Gorensek & Kohont, 2019). Digitalization increases the individual productivity of company employees, improves the speed and quality of work performance, and has a positive impact on work motivation (Benitez et al., 2022).

The process of digitalization demands managers at various levels of management to exhibit a distinct level of thinking, expertise, and competence. On the one hand, managers are implementing digital technologies across all areas of the organization, transforming the three basic components of business: customer experience, operational processes, and business

models (Westerman et al., 2011). On the other hand, business digitalization demands strong leadership capable of implementing changes, possessing a vision of goals and various possible paths to achieve them – digital leadership.

In the context of digitalization and digital transformation, digital leadership means the strategic use of a company's digital assets to achieve its business goals (Kubaraieva, 2022). The essence of digital leadership is multifaceted and is considered by various researchers from different perspectives. Thus, from the perspective of its impact on organisational innovation, digital leadership is defined as the process required to develop and sustain an innovative culture by rapidly bringing ideas to life through flexible IT and business architectures (Tanniru, 2018). In addition, the concept of digital leadership is explained as a management model to successfully and sustainably manage digital transformations (Troilo, 2021). In this study, it is pertinent to emphasize the distinctive nature of defining digital leadership as a combination of leadership qualities and the need to apply them: digital leadership is a concept that combines three blocks that digital leaders must fulfill – they must have (or learn) digital thinking and digital skills and combine these two elements for digital implementation to realize a common digital vision (Henselle, 2020). The leadership qualities inherent in digital leaders themselves are characterized as a set of personal, professional, social, and communicative traits and abilities that ensure effective management and stable relationships between the leader and the personnel (Prochan, 2022). Furthermore, it is noted that the individual-personal and socio-psychological characteristics of a leader as a personality influence the group and lead to the achievement of goals (Yahodnikova, 2009, Romanovsky, 2017), as well as affect the organizational resilience of companies (Üstgörül & Akkaya, 2023).

The article is dedicated to identifying the directions and content of transformational changes in managerial leadership qualities under the influence of business digitalization. The purpose of the article is to formulate and disclose scientific-theoretical and methodological provisions regarding the change of leader qualities in the era of business digitalization. The implementation of the research goal is carried out based on the classification and comparison of leadership qualities of managers in the conditions of traditional and digital leadership.

The advantage of this study is that the identification of transformations in the forms of leadership and leadership qualities of managers under the influence of digitalization helps to understand what competencies, skills, and attributes are inherent in modern managers and are currently important for the implementation of their powers, as well as in what ways they should be acquired and developed. Since digitalization is a complex phenomenon that is observed in all fields of social activity, it is appropriate to consider the specified transformational processes at the macro- and micro-levels separately and in relationship, which, in our opinion, is lacking in previous scientific works.

METHOD

The scientific *method of classification* was used as the basis for solving any scientific problem and is used to generalize knowledge. The classification of managerial leadership qualities as the subject of this research involves their arrangement and sorting according to certain characteristics. A review of literary sources revealed various approaches to studying the qualities of traditional and digital leaders. Some authors list leadership qualities without focusing on their classification. Other authors group leadership qualities into certain categories

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based on classification criteria. In our study, it is necessary to group the qualities of leaders so that we can further investigate the differences in the process of their transformation under the influence of digitalization, namely, to highlight the qualities of "traditional" and "digital" leaders.

By using *historical analysis*, the changes in styles and qualities of leaders during the implementation of digital technologies were observed. *Comparative analysis* was used to identify differences between the characteristics of "traditional" and "digital" leaders.

RESULTS

Digitalization provides opportunities for society and businesses to reach a higher level of socio-economic development. Ukraine is one of the leading countries in terms of the fastest implementation of digital technologies in state and local administration. Since 2015, transparency in fiscal policy has been ensured through the Prozorro electronic procurement system and the E-data web portal for the use of public funds. To increase government transparency and streamline administration, the Ministry of Digital Transformation was established in Ukraine in 2019. When implementing the presidential program "State in a Smartphone," the ministry launched and continuously expanded the digital application Diia, which allows Ukrainians to receive administrative services and documents from the government online.

Since 2020, there has been the position of Chief Digital Transformation Officer (CDTO) in state and regional authorities in Ukraine. Digital leaders in the regions are involved in implementing national digitalization projects (digital education, digital services, internet development) and initiating and shaping regional digitalization policies, the main task of which is to create a community among digitizers in territorial communities. In the absence of administrative levers of influence, a digital leader must possess certain qualities to set a good example for territorial communities, coordinate them, set the pace, and encourage change. This position should be held by a person with an analytical mindset, legal competencies (as the implementation of the regulatory framework at the local level is part of their duties), and managerial skills (ability to build a strong team, manage business processes, personnel, etc.) (Gurska, 2022).

For businesses, Ukraine has introduced the Diia.City platform, which, based on favorable legal and tax conditions such as a single 5% corporate income tax rate, simplified reporting requirements, and easier access for foreign employees, attracts IT companies to the country. In the future, the state plans to expand digital leadership through the implementation of company development programs in such areas as:

- Training IT specialists and encouraging investment in educational programs for digital transformation;
- Stimulating the creation of data accumulation and processing centres;
- Creating conditions for the post-war return of companies to Ukraine and the restoration of digitally destroyed infrastructure;
- Legal, financial, and market support for start-ups.

The level of technological advancement in Ukraine compared to other countries across the globe is characterized by its position in international rankings. Over the past 5 years, the following dynamics of digital development indicators have been observed (Table 1).

Table 1

Indicators of Ukraine's digital development according to international rankings (2019-2023)

International index	2019	2020	2021	2022	2023
Network Readiness Index	67 (121)*	64 (134)	53 (130)	50 (131)	43 (134)
ICT Development Index (%)	22.9**	not calculated	not calculated	not calculated	80.8
World Digital Competitiveness Ranking	60	58	54	N/A	N/A
Global Innovation Index	47 (129)	45 (131)	49 (132)	57 (132)	55 (132)

* In parentheses is the total number of ranked countries

**Data for the year 2017

Source: Portulans Institute

The Network Readiness Index characterizes the level of development of information and communication technologies (ICT) in countries worldwide and reflects how digitalization penetrates the economic and social spheres of life. Ukraine's ranking in this indicator improves annually. The ICT Development Index reflects the accessibility of ICT for population use. The percentage value of this indicator in Ukraine in 2023 increased almost fourfold compared to 2017 (during the period from 2018 to 2022, this index was not calculated). The value of the World Digital Competitiveness Ranking indicator for Ukraine also improved until 2021 (later, due to the Russian-Ukrainian war, Ukraine was temporarily excluded from the ranking due to lack of information). The strengthening of Ukraine's position in this ranking occurred primarily due to indicators characterizing the level of technological education in the country.

Expert analysts from McKinsey consulting company (Smet et al., 2023), speaking about leadership in the digital age, primarily note that its characteristics depend on the transformation of the organizational philosophy of modern companies. Management structures designed to satisfy the financial interests of a limited group of owners are becoming less relevant. New organizational architectures are emerging that are focused on creating value for multiple stakeholders and include networks of self-directed teams. Such models of organizational culture anticipate more open and collaborative work and require a change in leadership styles and ways, as well as leadership qualities. There is a shift from individual leaders to leadership teams in organizational management. As a result, leaders need to rethink their purpose and the way they work. The authors provide five vectors of change in leadership qualities:

- The leader should go beyond the confines of managerial functions, acquire a forward-looking vision for the company, and develop it in this direction.
- The leader should fully unleash the human potential in the organization by working to create an environment of belonging and psychological security.

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- The leader should abandon administrative-command leadership using hierarchical structures to communicate and receive management information in favor of creating a network of self-managed teams based on dialogue and cooperation.
- The leader should discontinue the practice of strict adherence to plans, thus creating a favorable environment for experimentation, research, learning, and creativity.
- The leader should refrain from constantly seeking to increase competitive advantages and market share, instead focusing on creating additional value for customers and other stakeholders, constantly improving their business models and ecosystems (Smet et al., 2023).

The importance of collaborating in running a business is demonstrated by a survey of top executives conducted by Harvard Business Review Analytic Services (2017). It was found that organizations whose leadership implemented the practice of collective leadership were more successful than those whose leaders did not support this idea. Such a form of leadership is directly associated with the digital revolution. The advantages of collective leadership include greater productivity and increased employee motivation through involvement in a common cause, and in many cases, it is a way for companies to survive in dynamic environments. The research also points out limitations and obstacles to the implementation of collective leadership: reluctance of managers, lack of strategic vision, risk aversion, fear of losing total control over processes, and lack of cooperation between departments.

The example of the Ukrainian IT company Railsware demonstrates how collective leadership is practically implemented within an organization (Lazor, 2023). Team leadership means that decisions are not made by a single manager, but the entire team is involved and motivated to achieve high-quality results. The company moves away from hierarchical structures of subordination; instead of functional departments, project-based mini-teams are created, consisting of necessary experts, allowing for comprehensive problem-solving based on continuous exchange of information, activity, creativity, and initiative of participants. The advantages of collective leadership in the company include:

- Openness and transparency of leadership to receive feedback when discussing issues;
- Communication between departments, availability of work information on internal information resources;
- Clear goal setting, task allocation, and role distribution;
- Maximum automation of document flow, communication, and other secondary processes;
- Discussion of ideas and proposals beyond the main project tasks (Lazor, 2023).

Since leadership can be divided into "traditional" and "digital", the qualities of a modern business leader can be classified accordingly to have a better understanding of how to increase management efficiency. The differences between the qualities of a digital and traditional leader are as follows.

Table 2***Transformation of leadership qualities from a traditional to a digital leader***

Traditional leader	Digital leader
Performance-oriented (product quality, profit, competitiveness, etc.)	Creates value for all stakeholders and develops organizational culture
Adheres to the business plan	Builds a business model
Supervises employees	Develops talent
Uses digital technologies as an auxiliary tool in management	Digital technologies are an integral part of the management process
Focuses on goals	Analyses interim results
Limited to achieving a specific planned result	Has a strategic vision of the company's development
Focused on overall management, functional management delegates down the hierarchy	A multidisciplinary, flexible leader
Applies individual leadership	Participates in shared leadership

Source: Westerman G. et.al. (2014), Yucebalkan B. (2018), Smet et.al.(2023)

Along with the differences shown in Table 2, it should be noted that digital leadership emerged from traditional leadership and is its logical and historical continuation. Therefore, there are also common qualities of traditional and digital leadership. In particular, it concerns the psychological properties of the individual (volitional qualities, responsibility, determination, flexibility of thinking), communication and professional competence, and group interaction skills that are developed and improved in the course of professional activity (Kozak, 2019).

CONCLUSIONS

The findings demonstrate that leadership in the digital age is important at both macro and micro levels. Thus, this study shows the transformation of leadership and leadership qualities at different levels of economic management, which complemented the existing scientific leadership theories. It is established that in order to promote digital leadership at the macro level, the government is responsible for introducing digital technologies in administration, providing citizens with convenient tools for accessing administrative services. It was established that Ukraine is one of the leading countries introducing digital technologies at the macro level. Consequently, the state can avoid difficulties during the pandemic and quickly set up public administration systems to work under quarantine restrictions, as well as to prevent the collapse of public administration during the ongoing full-scale war when regular missile and cyber attacks are jeopardizing the Ukrainian state and local institutions. At the micro level, the government is demonstrating digital leadership by implementing programs to attract companies and stimulate the development of the IT sector. Reasonable state policy in the field of digital environment regulation can bring the country to a significantly higher level of socio-economic development. The current trends in digital transformation are positive, as evidenced by the growing penetration of information and communication technologies in

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public life. The main task is to attract investment to the country and create conditions for the digital transformation of companies, including their business processes and management.

The study evidences that at the level of business management within companies, leadership in the context of digitalisation acquires specific characteristics compared to its traditional forms. The transition from individual to shared leadership provides benefits to all internal and external stakeholders of companies. At the same time, digital leaders have certain personal qualities who, unlike traditional leaders, have a strategic vision of the company, focus on the interests of business process participants and the environment, create an organizational culture, and develop talent. At the same time, leaders in the digital era still possess a set of traditional personal social and psychological qualities and professional competencies that allow them to communicate freely in a group, delegate authority, take responsibility and risks, and make final management decisions.

The question of the degree of transformation of personal-psychological and professional-competent qualities of a manager under the influence of the digitalization process remains debatable. The set of modern leadership qualities requires a more detailed classification, as well as an empirical analysis of the manifestation of their individual groups in the management of organisations, which forms the subject of further scientific research.

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FACTORS AFFECTING THE TOTAL FOREIGN EXCHANGE RESERVE ADEQUACY OF THE CENTRAL BANK: TURKEY AND AZERBAIJAN

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Abstract: *International foreign exchange reserves are widely acknowledged as a global medium of exchange that possesses a readily available characteristic. Official public assets, which are foreign assets kept and organized by the monetary authorities of countries, serve as a complement to foreign exchange reserves. Adequate levels of foreign exchange reserves are necessary for nations to meet their payment commitments and sustain the stability of their currency. The primary rationale for the Central Bank's decision to maintain liquid foreign exchange reserves is to establish a safeguard against any speculative assaults or fluctuations in the trade balance. The primary objective of this research was to ascertain the many elements that influence the sufficiency of the aggregate foreign exchange reserves in Azerbaijan and Turkey. The article examined the sufficiency of the gross foreign exchange reserves of the Central Bank of the Republic of Azerbaijan (CBAR) and the Central Bank of the Republic of Turkey (CBRT) based on the ideal reserve ratios recommended by the IMF. Following an extensive examination of theoretical and conceptual literature, this study aims to assess the sufficiency of the Gross Foreign Exchange Reserves held by the CBAR and CBRT. The proposed optimal reserve ratios are utilized to elucidate the reserve adequacy of these countries, while considering the theoretical relationship between the variables. To achieve this objective, a logit regression analysis was conducted using the data spanning from 2012 to 2022. The results indicate that there is a positive and statistically significant relationship between interest rates and the overall adequacy of foreign exchange reserves. Considering the influence of interest rates on economic stability and financial performance, this outcome is anticipated. Furthermore, it was shown that the exchange rate variable exhibited a statistically significant negative impact on the preceding period. The present empirical study offers an overview of the various elements that influence the sufficiency of the aggregate foreign exchange reserves of Azerbaijan and Turkey. The findings of this study offer crucial insights to decision makers regarding the variables that must be considered when overseeing foreign exchange reserves.*

Keywords: *Logit Model, Macroeconomic Indicators, Optimum Foreign Exchange Reserves*

INTRODUCTION

Foreign exchange reserves are often regarded as a reliable sign of a nation's robust economic and financial framework, therefore playing a crucial role in safeguarding economic stability. The assessment of a country's foreign exchange reserves and the examination of the causes influencing these reserves are significant indicators that provide insights into the economic and political conditions of nations.

Based on the criteria established by the International Monetary Fund (IMF), it is required that a nation's central bank maintains foreign exchange reserves that surpass the import index of said nation within a timeframe of three to six months (Wijnholds and Kapteyn, 2001). According to Mulder and Bussiere (1999), an alternative perspective posits that it is advantageous for a nation's foreign exchange reserves to exceed its short-term external debt. Alternatively, if the central bank's reserves are insufficient to cover short-term external debt, it will face a disadvantageous situation (Irefin and Yaaba, 2011; Cinel and Yamak, 2014; Lehto, 1994). The Central Bank of the Republic of Azerbaijan (CBRT) has experienced a rise in its foreign exchange reserves compared to 2022, primarily attributed to the growth in natural resources. The decrease in the foreign exchange reserves of the Central Bank of the Republic of Turkey (CBRT) in recent years, as compared to the year 2022, has elicited significant public responses. One of the primary factors contributing to the decrease in foreign exchange reserves is the utilization of foreign currency sales, given the inherent volatility of the exchange rate. Given the aforementioned concerns, it is evident that doing research on the gross foreign exchange reserves maintained by central banks holds significant significance.

The logistic regression model is a widely employed regression technique in the field of statistical analysis. The aforementioned model is employed for the purpose of quantifying the impact of independent variables and estimating the probability values associated with the dependent variable. The logit model is employed to quantify the impact of individual factors on the sufficiency of foreign currency reserves, while also providing probability values for the purpose of interpreting this impact. Upon the conclusion of the study, an analysis will be conducted on the elements that influence the foreign exchange adequacy of Turkey and the Republic of Azerbaijan, utilizing the framework of this particular model. Subsequently, the obtained results will be interpreted.

Foreign exchange reserves and their adequacy

Definition and Composition of Foreign Exchange Reserves

Reserves refer to foreign exchange assets that are held by a nation's monetary institutions. These reserves function as an insurance mechanism, ensuring the protection of the country during periods of international capital shortages (Park and Estrada, 2014). Previous research conducted by Elhiraika and Ndikumana (2007) has posited that the primary objective of central bank reserve accumulation is to address unforeseen imbalances in the balance of payments. However, more recent studies conducted by Cinel (2015) and Eren (2017) have attributed the preference for reserve levels to the reduction of costs incurred by countries during crises and as a preventive measure against potential crises (Jeanne and Rancière, 2011, pp. 905–930). Reserves can be conceptualized as the aggregate value of international securities and gold that are kept by the central banks of republics, in addition to the aggregate value of assets that possess the potential for convenient conversion into foreign exchange reserves.

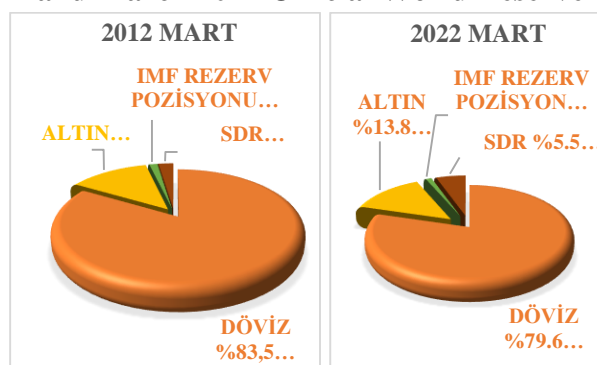
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Reserves are a component of the balance sheet that is subject to careful scrutiny by central banks due to its significant role in promoting stability during periods of financial imbalances. Reserve adequacy can be seen as a significant metric for assessing the vulnerability of financial and economic systems.

Reserves refer to assets that are within the authority of a country's monetary institutions. These assets serve as political tools during periods of economic recession and downturn, and can be easily exchanged and utilized as international external payment instruments (Memiş et al., 2014). According to the International Monetary Fund (IMF), reserves refer to external assets that serve as a safeguard against potential adverse risks. These reserves are managed by monetary policy-making authorities as necessary, aiming to mitigate risks in the balance of payments and reduce instability in the foreign exchange market of a country (IMF, 2015, p. 424). Based on widely accepted definitions, it may be inferred that reserves encompass the aggregate value of many assets held by a nation's central bank, including foreign currency equivalents and gold.

The official reserves that are widely acknowledged in academic research and are incorporated into the balance sheet of central banks as reserves, are worldwide recognized based on the information accepted by the International Monetary Fund (IMF). These reserves comprise the following subcomponents: Convertible foreign exchange assets cover a variety of instruments such as International Standard gold, IMF Reserve Position, Special Drawing Rights (SDR) and other reserve items. The distribution of reserve components in the global reserve total as of March 2012 and 2022 is depicted in Chart 1.1. Upon comparing the eras, it becomes evident that the weights assigned to reserve components, with the exception of the IMF reserve position, underwent alterations towards the conclusion of the 10-year period. According to the data presented in Chart 1.1, it can be observed that foreign exchange reserves occupy a prominent position within the reserve composition, amounting to SDR 9077.3 million as of March 2022. In comparison to the year 2012, there was an increase in the proportion of SDRs and gold, whilst the share of foreign currencies experienced a gain in quantity but a fall in proportion. The aforementioned advancements exemplify the fluidity inherent in reserve components.

Graph 1.1 2012 and March 2022 Official World Reserve Components



Source: IMF 2022 Annual Report, Appendix, International Reserves¹

¹ Source: <https://www.imf.org/external/pubs/ft/ar/2022/downloads/appendix.pdf>.

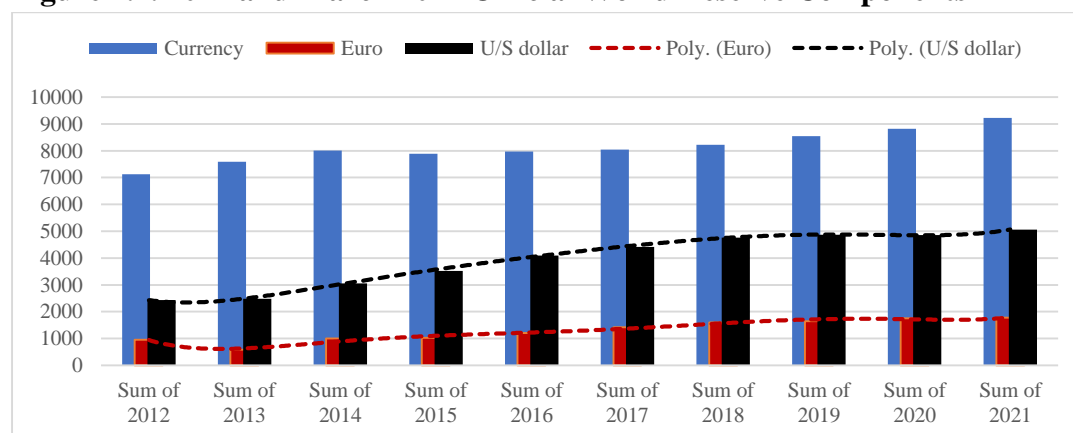
Foreign currency assets that can be converted have the greatest level of liquidity and make up the largest portion of reserves. In contemporary circumstances, there are numerous justifications for nations to maintain a substantial proportion of their reserves in foreign currency. The primary factors contributing to this phenomenon are the limited profitability of gold in global markets, as well as the lack of substantial income generated by SDR and IMF reserve positions. Consequently, central banks maintain a substantial proportion of their international reserves, which are characterized as assets that are readily available for use in overseas markets. These reserves are denominated in foreign currency and are allocated to foreign markets subsequent to a thorough assessment of various investment vehicles, taking into consideration factors such as liquidity and return (IMF, 2014).

Numerous nations accumulate their domestic currency as reserves for foreign exchange, however they exhibit a preference for foreign currencies such as the US dollar, euros, Japanese yen, Swiss francs, and British pounds (Eren, 2017). The primary rationale for assessing the reserves of these nations individually is their utilization as a reserve element within the global market system, thereby augmenting the influence of these countries over the market system.

The US dollar has a substantial share of foreign exchange reserves due to many factors. One crucial aspect is that, although the disintegration of the Bretton Woods System, nations persisted in maintaining the US dollar as a reserve asset owing to their unwavering faith in the American economy. An further significant factor contributing to this phenomenon is the influence exerted by the US dollar on the global economy, stemming from its status as the exclusive superpower following the disintegration of the Soviet Union (Yaman, 2003, p. 13). Even nations that engage in the production of raw resources are compelled to establish their exchange rate policies in relation to the United States dollar, as this has a direct impact on their domestic markets. Simultaneously, a substantial proportion of manufacturing industry items are priced in dollars and sold in global marketplaces.

The data presented in Figure 1.1 illustrates the progression of government foreign exchange reserves, as well as the utilization of the US dollar and the euro as reserves, from 2012 to 2021, measured in billions of SDR.

Figure 1.1. 2012 and March 2021 Official World Reserve Components



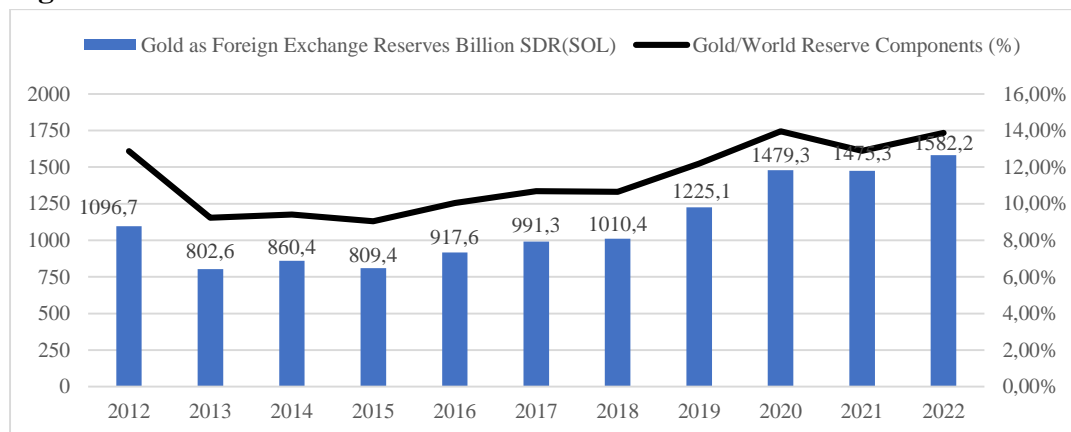
Source: IMF Annual Report, 2012, 2022

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It is evident that the value of the US dollar as a foreign exchange reserve will exceed \$5 trillion by the conclusion of 2021. According to the provided data, the United States dollar constitutes 54.9 percent of the aggregate 9.2 trillion foreign exchange reserves, or over half of the total value of such reserves. The primary indicator of the significance of the US dollar in reserves is its representation of around 44 percent of total international reserves during the specified time. The euro, currently the second most prominent currency in foreign exchange reserves after the US dollar, has had a marginal gain in its exchange rate value relative to the US dollar during certain time periods (Figure 1.1). The dollar's devaluation during certain time periods and the rise in the euro's proportion of total reserves can be ascribed to the policy actions enacted by the United States in reaction to the ongoing global crisis.

Gold, classified as a valuable metal, holds the distinction of being the oldest reserve element kept by nations according to global benchmarks. The inclusion of standard gold in a nation's reserve components may be attributed to several key factors. These include its capacity to serve as collateral, its low risk factor index, its function as a safeguard against crises, and the intention to enhance reserve diversification (Sümmeoğlu, 2010).

Figure 1.2. March 2012 and 2022 International Standardized Gold and Share in Reserves



Source: IMF Annual Report, 2012, 2022

According to the data presented in Figure 1.2, the aggregate quantity of gold reserves maintained by the central banks of various nations falls within the approximate range of SDR 1100–1500 billion in international reserves from 2012 to 2022. This range exhibits intermittent fluctuations, with certain periods seeing a temporary decrease, succeeded by subsequent periods of expansion. Consequently, the limited or nonexistent utilization of gold in the financial systems of nations leads to its displacement from the focal point of the monetary system (Yaman, 2003, p. 11). Conversely, in the present era, financial instruments like electronic money have gained significance and are increasingly utilized for cross-border and inter-individual transactions. Upon comparing the expenses associated with this approach to the expenditures incurred by gold, including storage and transportation, it becomes evident that the overall costs of gold are considerably elevated. Consequently, gold is regarded as a less favored financial instrument.

The reserve position is a reserve resource established by the International Monetary Fund (IMF) in 1969. Every member country of the IMF is required to maintain a predetermined allocation of Special Drawing Rights (SDRs). The predetermined quota serves as a determinant of the financial contribution a member country must make to the International Monetary Fund (IMF), its allocation of financial resources, and its impact on the IMF's decision-making processes. Additionally, it serves as an indicator of the country's voting power and its economic standing relative to other nations. The significance of IMF quotas for countries is evident (Pnar & Erdal, 2011: 544-545). The determination of these quotas is based on Special Drawing Rights (SDRs), which serve as the International Monetary Fund's unit of account. As of March 2021, Turkey's International Monetary Fund (IMF) quota stands at about SDR 4.659 million (1 SDR = 1.4247 in October 2022), equivalent to USD 6.637 million. In contrast, Azerbaijan's allocated quota amounts to SDR 391.7 million, equivalent to around \$559 million.

Special Drawing Rights (SDRs) refer to a collection of currencies that are generated and made available by the International Monetary Fund (IMF) on the market as a distinct currency element. The money in question does not derive its value from any specific tangible resource or nation. The International Monetary Fund allocates reserve resources to all its members based on their quotas, with the aim of diversifying countries' reserves (Kester, 2001, p. 18). In a concise manner, this currency serves solely as a reserve element in transactions conducted between the International Monetary Fund (IMF) and the member nations of this union. Foreign Exchange Reserves Adequacy Indicators

It can be argued that nations maintain reserves to mitigate potential expenses for diverse purposes, and the magnitude of these reserves is subject to variation according to the distinct structures of each country. Measuring the adequacy indicators of reserves is crucial for a country as it serves as a safeguard against potential national and international risks, mitigates the cost of a prospective crisis, and serves as an indicator of financial profitability. The measurement of reserve adequacy and the factors influencing reserve adequacy have been a subject of ongoing debate in numerous research due to advancements in international trade and the monetary system. This study aims to assess the reserve adequacy of two countries by employing widely recognized methodologies.

Measuring the optimal adequacy of foreign exchange reserves : Turkey-Azerbaijan

Nations that maintain high levels of reserves generally exhibit a more rapid recovery from the adverse consequences of financial crises compared to nations with lower levels of reserves. The reserve adequacy level, as defined by Heller (1966, p. 317), refers to the point at which the marginal benefit is equal to the marginal cost. Conversely, Bird and Rajan (2002, p. 7) contend that there is no upper limit to the reserve adequacy level. Instead, they argue that the monetary authority consistently endeavors to augment the level of reserves.

Various methodologies have been devised in academic literature to evaluate the sufficiency of reserves. The approach suggested by the IMF, which is universally applicable, involves calculating the ratios of reserves to imported goods and services, short-term external debt, and broad money supply (CBRT, 2011a).

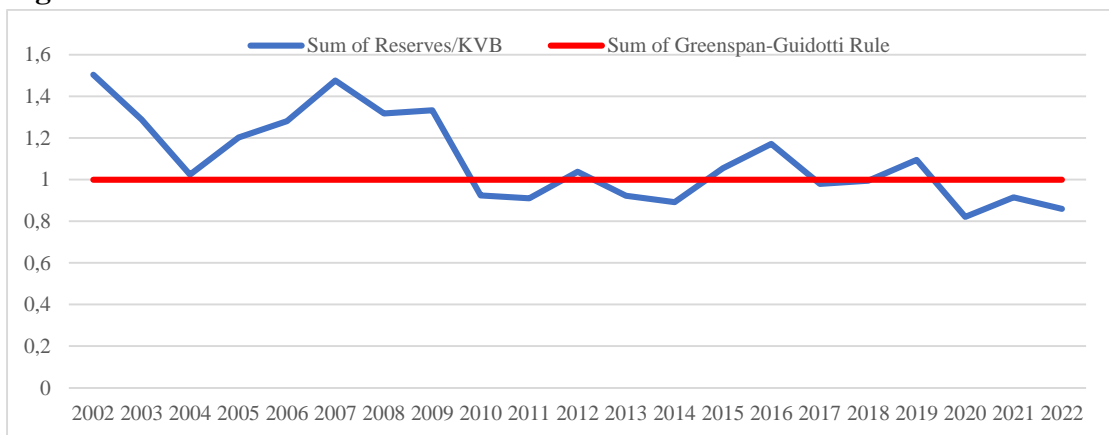
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Ratio of short-term debt to international reserves

The Short-Term External Debt (STED) method is employed by the monetary authority of a nation with the objective of maintaining adequate reserves to meet both domestic and foreign obligations that are scheduled to mature within a one-year timeframe. This demonstrates the government's capacity to meet its debt obligations (Wijnholds & Kapteyn, 2001, p. 9).

In terms of external debt stock, the Republic of Turkey occasionally attains the top position among emerging market economies (EMEs). In comparison to alternative alternatives, it is crucial to evaluate the short-term foreign debt approach with the reserves of these countries. According to the data presented in Figure 1.3, it can be observed that the utilization of all reserves in the years 2010, 2011, 2013, 2014, 2014, 2017, 2018, and 2020-2022 would not be adequate to meet the short-term debt obligations of the nation, as depicted in Figure 2.10. Turkey's creditworthiness in the foreign market and its CDS (Credit Risk Premium) are deemed to be very deficient and insufficient due to a gradual decrease in this ratio.

Figure 1.3 CBRT Reserve / Short Term Debt Ratio in 2002 and 2022



Source: CBRT 2023, (Access date: January 1, 2023)

The values of the link between Azerbaijan's total reserves and short-term external debt up to one year for the periods 2004-2021 are presented in Table 1.1. This analysis was conducted using the CVD model to assess the reserve adequacy of Azerbaijan. During these time intervals, the mean value of the ratio between reserves and short-term debt exceeds 36. This substantial ratio can be attributed to the country's strategic emphasis on long-term borrowing rather than short-term borrowing.

Table 1.1 Reserves / Short-Term Debt Ratio (Million USD)²

History	TP RESPARPD K1	(CVB)	Reserve/CVB
2004	3064,73	198,00	15,48
2005	2872,77	290,00	9,91
2006	4096,31	198,00	20,69

² Source: <https://www.cbar.az/page-40/statistical-bulletin>

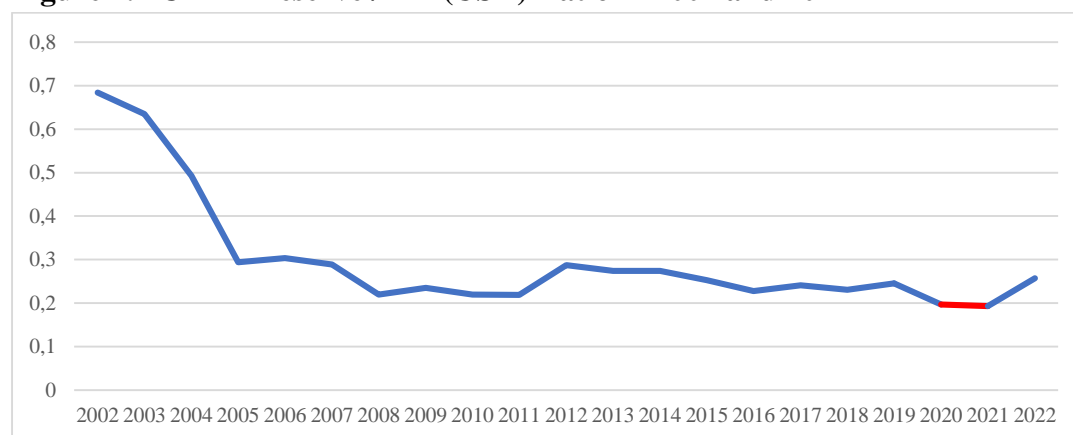
2007	6265,85	202,00	31,02
2008	16812,27	356,00	47,23
2009	20551,32	502,00	40,94
2010	29661,35	422,00	70,29
2011	40762,92	484,00	84,22
2012	47110,02	572,00	82,36
2013	51884,98	700,00	74,12
2014	52542,41	1 900,00	27,65
2015	40390,59	1 700,00	23,76
2016	39142,98	2 200,00	17,79
2017	43128,85	1 500,00	28,75
2018	46975,79	2 100,00	22,37
2019	54869,28	1 700,00	32,28
2020	56510,45	1 600,00	35,32
2021	59321,54	1 200,00	49,43

Ratio of monetary aggregates to international reserves

The approach referred to as the broad money supply or monetary base approach, as described in the literature, involves comparing the amount of reserves with monetary aggregates to assess reserve sufficiency (Reedy, 2003, pp. 104–105). In the event of a financial crisis within a nation, it is not uncommon for residents to redirect their investment choices away from the domestic currency and towards assets denominated in other currencies. The literature does not reach a consensus on the specific ratio due to the significance of this relationship. However, it is widely acknowledged that the recommended range for a country's reserves is between 10 and 20% of its M2 (Cinel, 2015, p. 135).

The declining trend of this ratio in Turkey since 2007 can be attributed to the consistent growth of the country's M2-defined money supply. Considering this methodology, Turkey has consistently maintained a ratio above 20% in all years except for 2020-2021, with an average of 30% from 2002 to 2022 (Figure 1.4).

Figure 1.4 CBRT Reserve / M2 (USD) Ratio in 2002 and 2022

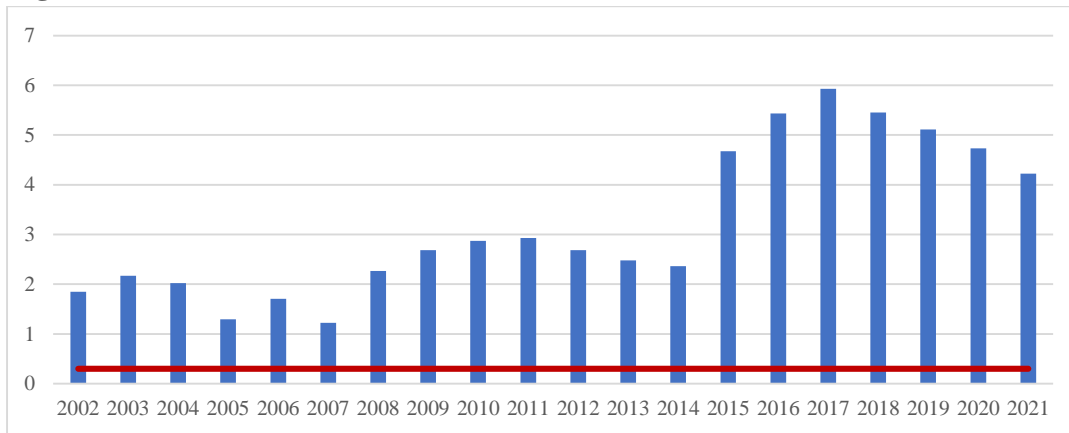


Source: EVDS 2023, (Date of access: January 1, 2023)

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The analysis of the country's reserve adequacy is conducted using the monetary base approach. This involves calculating the ratio of the total reserves held by the Central Bank of the Republic of Azerbaijan and the State Oil Fund to the M2 dollar values for the period spanning from 2002 to 2021. Each of the aforementioned ratios exceeds the commonly acknowledged ratio within the method (10–20%) and has consistently surpassed the arithmetic mean of 4 from 2002 to 2021 (see Figure 1.5).

Figure 1.5 2002 and 2021 AC Reserve / M2 (USD) Ratio



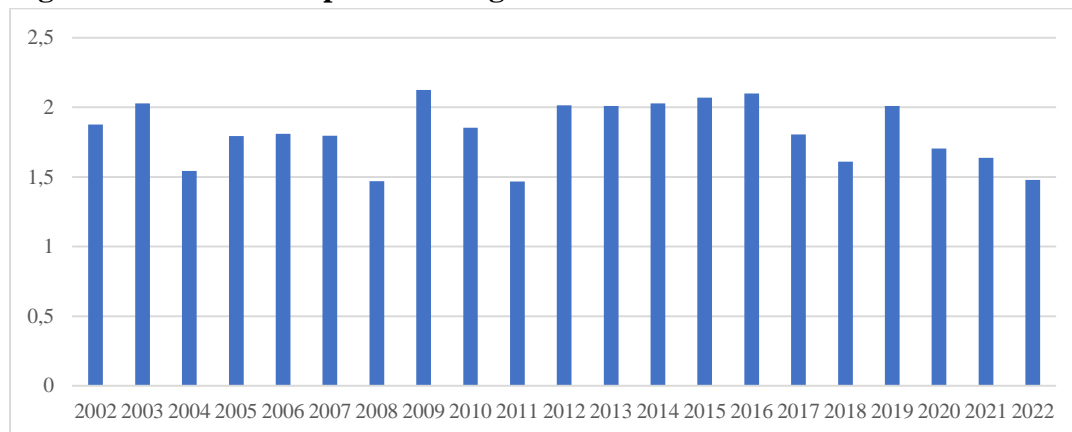
Source: ACMB 2023, (Accessed February 16, 2023)

Adequacy of international reserves to cover country imports

The methodology employed in assessing the sufficiency of foreign exchange reserves relies on the evaluation of international reserves in relation to the yearly import volume. The conventional methodology for assessing reserve adequacy posits that a nation ought to maintain sufficient reserves to meet its import requirements, under the assumption of no capital inflows or outflows. Despite the commonly acknowledged guideline of 3 months, the existing reserves of numerous developing nations have been sufficient to meet imports for a much longer duration (IMF, 2000; Wijnholds and Kapteyn, 2001).

The utilization of this methodology in the context of Turkey demonstrates that the overall reserves are enough. However, during the period from 2017 to 2022, there has been a noticeable decrease in the nation's international reserves, which has hindered its ability to cover its import expenditures. The decrease in the 3-month import payment ratio, which serves as an indicator of adequacy, particularly when it drops below 2%, exhibits similarities to the global crisis experienced between 2004 and 2008, hence suggesting the potential occurrence of a future catastrophe (see Figure 1.6). The fall in question can be ascribed to various variables, encompassing global health concerns, conflicts in nations with which the country has close ties, and recent variations in exchange rates. Furthermore, the economic position was exacerbated by the earthquake disasters that occurred in the country in 2023. Collectively, these elements give rise to a concerning predicament for the nation's economic prospects.

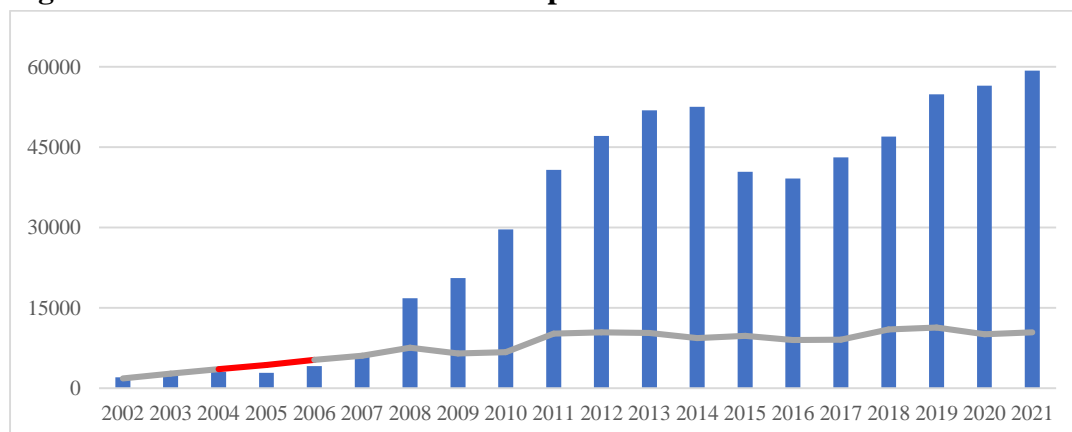
Figure 1.6 3-Month Import Coverage Ratio of CBRT Reserves in 2002 and 2022



Source: TurkStat 2023, (Date of access: January 3, 2023)

The Republic of Azerbaijan has experienced a notable growth in the ratio of reserves to quarterly imports since 2009. Furthermore, the reserves held by the Republic of Azerbaijan are deemed adequate to meet its yearly import requirements for an extended period, as depicted in Figure 1.7. Azerbaijan possesses ample resources to fund its imports, encounters no difficulties in financing imports, and maintains financial stability.

Figure 1.7 AC Reserves and Annual Imports in 2002 and 2021



Source: ACMB and SOFAZ 2023, (Accessed February 16, 2023)

Taking into account all the aforementioned methods for assessing the amount and sufficiency of the CBRT reserves, it can be concluded that reserves are sufficient for all specified years according to the import approach. However, other ways exhibit variations on a year-by-year basis, and in the majority of cases, reserves are insufficient for the period of 2020-2021. Based on the aforementioned methodologies employed to assess the level and sufficiency of the reserves of the Republic of Azerbaijan, it is evident that the reserves are deemed insufficient for some years (2005-2006) as indicated by the import approach, although they are deemed sufficient for all years according to alternative techniques.

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Factors Affecting the Adequacy of Foreign Exchange Reserves: Turkey-Azerbaijan

The evolution and patterns of global foreign exchange reserves are contingent upon various criteria. The size and structure of foreign exchange reserves can be influenced by various factors, including a nation's economic growth, levels of exports and imports, policies implemented by central banks, and volatility observed in international financial markets.

The phenomenon of international investment flows entails the influx of foreign investment into a nation, which contributes to the augmentation of foreign currency reserves, whilst the outflow of foreign investment from a nation leads to a reduction in foreign exchange reserves. Nevertheless, elevated interest rates have the potential to augment foreign exchange inflows by enhancing the appeal of a nation's currency, so bolstering its foreign exchange reserves. Simultaneously, an expansion in the money supply heightens the likelihood of inflation within the nation, potentially leading to investor withdrawal and subsequently reducing the country's foreign exchange reserve (Kaya, 2012).

The escalation of external debt of Turkey throughout the year 2022 resulted in a reduction of foreign exchange reserves. The primary determinant of Azerbaijan's reserve stock is the volatility of oil prices and the magnitude of oil sales inside the nation. There exists a consistent linear correlation between fluctuations in oil prices and the aggregate reserves of the Republic of Azerbaijan over many time periods. Notably, the escalation in oil prices emerges as the primary factor contributing to the expansion of these reserves.

Elevated interest rates enhance the appeal of a nation's currency and augment its foreign exchange reserves. As of March 19, 2021, the Central Bank of the Republic of Turkey initiated a reduction in the interest rate from 20.50%. By the initial quarter of 2023, the percentage had attained 8.50%. Azerbaijan has a low interest rate of 8.75%. The presence of low interest rates restricts the degree of interest from foreign investors in the country, hence posing challenges in augmenting foreign exchange reserves. The inflation rates in Turkey have exhibited significant volatility throughout the past two decades. Simultaneously, the presence of elevated inflation rates and the expansion of the money supply in Turkey exert a mitigating influence on the level of foreign exchange reserves. An examination of the inflationary trends in the Azerbaijani economy from 1996 to 2001 indicates that the devaluation of the manat currency resulted in a rise in inflationary pressures.

The presence of domestic political problems and uncertainties has the potential to diminish the confidence of foreign investors in a nation, thus resulting in a decrease in foreign exchange reserves. Countries' foreign exchange reserves are impacted by foreign policy tensions. The challenges encountered by nations in their interactions with trading partners result in a reduction of foreign exchange reserves. The imposition of sanctions in the global sphere also has an impact on the foreign exchange reserves of nations. Investments in nations result in a reduction of foreign exchange reserves through the imposition of trade volume restrictions on countries. An instance of this is the Nagorno-Karabakh conflict, which has had an impact on Azerbaijan's foreign exchange reserves. Another instance is to the strained relationship between Turkey and the United States around the S-400 missile system. The imposition of sanctions by the United States results in a decline in trade volume and a drop in foreign exchange reserves (Demir 2020).

Logit Method

The current stage of the study involved an examination of the logit technique, which is represented by quantitative preference models. The literature encompasses a regression method that is constructed upon two dependent variables and exhibits linearity through the application of transformations. Statistical approaches are employed to elucidate the likelihood of a phenomenon. The validity of the logit technique is contingent upon the binary nature of the dependent variable. The fundamental concept underlying the logit technique entails applying a logarithmic transformation to the probability of the dependent variable's occurrence, followed by conducting regression analysis to ascertain the association between the independent variables (óakmakyapan, 2011). The logit approach reveals the link between the dependent variable and the independent variable when the dependent variable is binary, meaning it can take two distinct values. This model is typically employed when the value to be estimated occurs in two distinct states.

$$P_i = E(Y = 1(X_i)) = \frac{1}{1 + e - (\beta_0 + \beta_1 X_i)}$$

Pi = Independent Variable

Xi=Data

i=Probability of making a choice

e=2.72

Analysis of Factors Affecting the Total Foreign Exchange Reserve Adequacy of the Central Bank of Azerbaijan-Turkey : Logit Method

The objective of employing the logit approach in the empirical investigation is to assess the impact of the identified macroeconomic indicators on the magnitude of foreign exchange reserves, hence leading to the emergence of two distinct values for the dependent variable. The data utilized in this study were acquired from many reputable sources, including the Central Bank of the Republic of Turkey (CBRT), the Data Distribution Site (DDS), the Central Bank of the Republic of Azerbaijan (CBRT), the Turkish Statistical Institute (TurkStat), the World Bank, and the OECD. The analysis utilizes data spanning from 2012 to 2022. The study considers several aspects to analyze changes in foreign exchange reserves at the factor scale. However, certain components are disregarded due to the study's multilinear nature. In this study, the explanatory variables used to assess the impact of macroeconomic indicators on the level of foreign currency reserves are X₁ (interest rates), X₂ (inflation rates), X₃ (gross national product), X₄ (real exchange rate), and X₅ (unemployment rates). The selection of the logit regression model for the explanatory variables is determined in the following manner: Logit (Y)= β₀+ β₁X₁+ β₂X₂+ β₃X₃+ β₄X₄+ β₅X₅+ε In the given regression equation, the dependent variable, denoted as Y, represents the total foreign exchange reserve adequacy. The coefficients of the constant term and the explanatory variables are denoted as β₀, β₁, β₂, β₃, β₄ and β₅ respectively. The model's coefficients represent the impact of each explanatory variable on the overall adequacy of foreign exchange reserves. A categorical variable, known as an indicator variable, typically has two distinct values, typically 0 and 1. In this scenario, we can employ the numerical value "1" to denote that the overall foreign exchange reserve is sufficient, whereas "0" can be used to indicate that it is insufficient. For our study, we will utilize the dependent variable as follows: The variable Y is equal to 1, indicating the presence of factors that influence the adequacy of the total foreign exchange reserves of Azerbaijan and Turkey.

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Conversely, the variable Y is equal to 0, suggesting the absence of factors that affect the adequacy of the total foreign exchange reserves of Azerbaijan and Turkey.

Table 1.2 Logit Model Analysis Results of the Established Model

<i>Variable</i>	<i>Estimated Parameter</i>	<i>Standard Error of Parameters</i>	<i>Wald Statistics</i>	<i>Significant(p)</i>	<i>Odds Ratio</i>
Fixed Term	55,365	71,650	0,597	0,440	-
X ₁	3,177	0,177	17,454	0,000	24,070
X ₂	-0,230	0,193	1,424	0,233	0,795
X ₃	0,000	0,000	2,645	0,104	1,000
X ₄	-51,894	34,225	2,299	0,129	0,000
X ₅	-0,019	0,017	1,233	0,267	0,981

$$\text{logit}(p) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5$$

Here, p represents the probability value and ranges from 0 to 1. The formula includes the constant term, denoted as β_0 , β_1 , β_2 , β_3 , β_4 , and β_5 , as well as the coefficients X₁, X₂, X₃, X₄, and X₅, correspondingly.

$$\text{Logit}(p) = 55,365 + (-3,177 \times X_1) + (-1,232 \times X_2) + (0,446 \times X_3) + (-0,454 \times X_4) + (0,139 \times X_5)$$

The model's performance was assessed using the log-likelihood approach. The adequacy of the model was assessed. A model's fit to the data improves as the log-likelihood value increases. The calculation of the log-likelihood value involves taking the logarithm of the probability values that have been determined. The value has the potential to be negative. In order to evaluate the adequacy of the model, it is crucial to compare the log-likelihood values of many models and choose the model with the highest value. It was determined that the log-likelihood value of the model is -53.68. This finding suggests that the model possesses a satisfactory level of fit to the data.

The logit regression model coefficients utilized for evaluating the impact on foreign exchange reserve sufficiency are displayed in the table. Furthermore, in order to assess the statistical significance of each variable, the Wald statistic and p-value are provided. In hypothesis testing, the Wald statistic is computed by dividing the coefficient by the standard error. The P value is a statistical measure derived from the hypothesis test of each coefficient, ranging from 0 to 1. A decrease in the P value indicates a higher level of statistical significance in the impact of the independent variable on the dependent variable. The odds ratio quantifies the ratio at which a one-unit increase in an independent variable results in a corresponding change in the probability of the dependent variable. The study revealed that the coefficient of the fixed variable was 55.365. The baseline value for foreign exchange reserve sufficiency is determined by holding other factors constant. The variable of interest rate (X₁) exhibits the most significant impact on the adequacy of foreign exchange reserves. The coefficient of the variable is evaluated to be 3.177, with a p-value of 0.000, indicating its statistical significance inside the model. This finding suggests that, while controlling for other variables, a one-unit rise in interest rates would result in a 24.070-fold increase in foreign exchange reserve

adequacy. The coefficient associated with the inflation rate variable (X2) is -0.230, and the corresponding p-value is 0.233. These results indicate that the coefficient lacks statistical significance inside the model. Consequently, if all other factors remain same, a one-unit rise in inflation rates would result in a 0.795-fold reduction in FX reserve adequacy. However, this impact does not have statistical significance. The coefficient for the GDP variable (X3) is 0.000, and the p-value is 0.104, indicating that it lacks statistical significance in the model. Consequently, when all other factors remain unchanged, a one-unit rise in GDP does not impact the sufficiency of foreign exchange reserves. The coefficient for the exchange rate variable (X4) is -51.894, and the p-value is 0.129, indicating that there is no statistically significant relationship in the model. This suggests that, while controlling for other variables, a one-unit increase in the exchange rate during the preceding period does not impact the adequacy of foreign exchange reserves. The empirical analysis reveals that the coefficient associated with the unemployment rate variable (X5) is -0.019, while the p-value is 0.267, indicating a lack of statistical significance within the model. Consequently, while keeping other factors unchanged, a one-unit rise in unemployment rates is associated with a 0.981-fold reduction in foreign exchange reserve adequacy, but this impact is not statistically significant.

CONCLUSIONS

Based on the findings of our literature review, it is suggested that in order to enhance reserve adequacy in Turkey, it would be advisable to augment the central bank policies pertaining to the diversification and expansion of rediscount credits. These credits are primarily utilized by exporting firms and are converted into US dollars. Additionally, it is recommended to incorporate under-pillow scrap gold within the country's central bank reserves and the financial system. In order to mitigate the potential risks associated with currency rates and decrease reliance on natural resource revenues, Azerbaijan aims to diversify its investments across other sectors.

The data indicate that interest rates have a substantial impact on the overall adequacy of foreign exchange reserves ($p < 0.05$), whilst other variables do not show statistical significance. The odds ratio for total FX reserve adequacy improves by 24.070 when the "Interest Rates" variable increases by one unit. However, the impact of other factors on total FX reserve adequacy is not statistically significant.

The analysis demonstrates that interest rates exert a substantial impact on the overall adequacy of foreign exchange reserves. This finding suggests that the implementation of interest rate policies can serve as a viable strategy for enhancing the sufficiency of the foreign exchange reserves in Azerbaijan and Turkey. The impact of other variables on the overall adequacy of foreign exchange reserves is not statistically significant. Nevertheless, the p-value associated with the exchange rate variable exhibits statistical significance, hence necessitating a more comprehensive examination of its impact through the inclusion of a longer temporal scope.

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EMERGING PATHWAYS TO GREEN PURCHASE INTENTION: DECODING THE INFLUENCE OF ENVIRONMENTAL AWARENESS, GREEN PERCEIVED VALUE AND TECHNOLOGY ADOPTION MODEL ANTECEDENTS ON CONSUMERS' PURCHASE INTENTION

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Abstract: *Understanding the buying behaviour of consumers for green products has become an emerging issue. The purpose of present study is to assess purchase intention of consumers with respect to green products (environment friendly) shopping in India. Further, this study examines the role of environmental awareness, green perceived value, perceived usefulness and attitude towards using in building consumer intentions to purchase green products. Further, the study extends the TAM (Technology Adoption Model) by Davis (1989) by incorporating external variables like environmental awareness and green perceived value. This study examines the information gathered from 260 clients via a Google form survey. Structural equation modeling (SEM), validity and reliability testing, and exploratory factor analysis were conducted using the gathered data. The result of the present study shows that environmental awareness and green perceived value exert positive and differential effects on attitude towards using green products. The study also found that attitude and perceived usefulness are equally important for the purchase intention of customers towards green products. Implications of the present work are useful for academicians, marketers, customers, and policy makers.*

Keywords: *Green products; Environmental awareness, Green perceived value, perceived usefulness, attitude*

1. Introduction

In recent years, the market for green products in India has been steadily growing due to increasing environmental awareness, government initiatives, and consumer demand for sustainable and eco-friendly options. The emergence of green products in India is also driven by factors such as regulatory support, consumer awareness, and corporate sustainability initiatives (Patel & Joshi, 2020). Green products face challenges related to consumer trust, credibility of eco-labels, and the perception of greenwashing among consumers in India. Consumers in India are increasingly inclined towards purchasing green products due to environmental concerns and awareness (Jaiswal, Singh, Kant & Biswas, 2021).

Green products have been classified based on their uniform impact on environmental conservation and protection. Buettner and Madzharova (2021) categorized Energy-Efficient Products such as Refrigerators, air conditioners, LED (light emitting diode) lights based on their low energy consumption. Supriadi, Astuti and Firdiansjah (2017) included water saving

products such as showerheads and efficient irrigation systems as green products due to resource conservation. Fthenakis and Kim (2019) considered Renewable Energy Technologies products like solar photovoltaic and wind turbines as green products due to curbing carbon emissions and promoting sustainability. Ding (2008) categorized sustainable building materials such as bamboo flooring and recycled steel as green products. Gupta and Polonsky (2021) considered organic and eco-friendly products including organic food products, natural personal care items, and biodegradable packaging materials as green products for being eco-friendly products. Certified Products such as Energy Star appliances, Fair Trade goods and Leadership in Energy and Environmental Design (LEED)-certified buildings have been considered green products due to strict environmental standards and ensuring sustainability (Zou, 2019). Yang, Huang and Lin (2022) have included products for green transportation like Electric vehicles (EVs) and hybrid cars as green products due to carbon emissions reductions.

The willingness to pay premium for green products varies among consumers based on their socio-economic background and level of environmental consciousness (Jaiswal, Singh, Kant, & Biswas, 2021). Companies are adopting green product development strategies, sustainable supply chain practices, and green marketing campaigns to cater to the evolving preferences of environmentally conscious consumers (Joshi & Patel, 2020). Challenges such as consumer scepticism, lack of awareness, and price sensitivity still exist in the Indian market, impacting the adoption of green products (Kumar, 2016). The current study evaluates a theoretical framework that provides solutions to the following queries.

- Are attitudes toward usage and perceived usefulness of green products influenced by the conceptions of environmental awareness and green perceived value?
- Does a customer's perception of usefulness affect how they feel about green products?
- Do attitude and perceived usefulness influence a customer's behavioural intention towards green items?

In three different ways, this study adds to the body of literature. First, from the standpoint of technological acceptability, the current study creates a model for behavioural intention. Secondly, the research broadens the scope of the TAM model by including pertinent elements like perceived green value and environmental awareness. Lastly, the study's research findings demonstrate how perceived green value and environmental awareness impact attitudes and perceived usefulness, which in turn impact behavioural intention. The research paper's remaining sections include the following subsections: methodology, results, discussion, and conclusion; they also include the section on drawing hypotheses from the literature review.

2. Literature Review and Hypothesis Development

The Technology Acceptance Model (TAM) propounded by Davis (1989) has been widely adapted for assessing users' acceptance and adoption of technology, including products. While the original TAM model primarily focuses on technology acceptance, its principles have been extended to study perceived usefulness and acceptance of products as well, including green products (Venkatesh & Davis, 2000; Lin & Chen, 2006). New technologies develop very quickly and exponentially, people should be ready for accepting new

technology depending upon the usage (Fornazarič, 2023). Collaborations between government bodies, industry stakeholders, and non-governmental organizations (NGOs) are essential for promoting the adoption and growth of green products in the Indian market (Joshi & Patel, 2020).

2.1 Environmental Awareness

Dunlap and Van Liere (1978) in their study introduced the concept of a "New Environmental Paradigm" and proposed a measuring instrument to assess individuals' environmental awareness and attitudes toward environmental issues. Hines, Hungerford and Tomera (1986) carried out a meta-analysis of previous work on responsible environmental behaviour, including factors that contributed to environmental awareness and pro-environmental actions. Stern and Dietz (1994) examined the value basis of environmental concern, highlighting how values play a crucial role in shaping individuals' environmental awareness and behaviours. Environmental education is considered as precondition for our common future (Smolović, Živanović, Abramović & Živanović, 2023).

De Groot and Steg (2008) focused on different value orientations (egoistic, altruistic, and biospheric) and how they influence beliefs related to environmentally significant behaviour, providing insights into environmental awareness. Kaiser and Schultz (2009) investigated the attitude-behaviour relationship concerning environmental awareness and pro-environmental behaviour, considering the moderating role of behavioural difficulty.

Hypothesis 1: *Environmental awareness (EA) exerts a significant positive effect on Perceived Usefulness.*

2.2 Green Perceived Value

Peattie and Peattie (2003) examined that how reducing social risk could encourage sustainable consumption, which was closely tied to the perceived value consumers associate with green products. Kim and Choi (2005) explored the factors that influence consumers' green purchase behaviour, including cultural aspects like collectivism, environmental concern, and personal consumer efficacy (PCE). Thøgersen (2004) offers insights into how cognitive dissonance theory can help understand the inconsistencies in environmentally responsible behaviour and, consequently, the perceived value of green products. Vermeir and Verbeke (2006) in their study focused on sustainable food consumption for young adults, using the Theory of Planned Behaviour to analyze how confidence and values influence the perceived value of sustainable products. Luchs and Mooradian (2012) highlighted the role of gender and personality traits in shaping sustainable consumer behaviour and perceived value of green products. Factors such as product quality, price, brand reputation, and availability of green products influence consumer behaviour towards green purchases (Jaiswal, Singh, Kant & Biswas, 2021).

Hypothesis 2: *Green Perceived Value (GPV) exerts significant effect on Perceived Usefulness.*

2.3 Perceived Usefulness

Davis's (1989) seminal work on TAM establishes the foundation for understanding how the perceived usefulness influences user acceptance of technology, which can be extended to products. Grunert and Juhl (1995) mentioned the relationship between values, environmental attitudes, and the purchase of organic foods, shedding light on perceived usefulness of eco-friendly products. Venkatesh and Davis (2000) extend the TAM model and provide empirical evidence on the factors influencing perceived usefulness of technology adoption and ease of use, which can be applicable to product acceptance as well. Chan (2001) investigated the determinants of green purchase behaviour (man–nature orientation, degree of collectivism, environmental effect and ecological awareness) among consumers, including the perceived usefulness of green products. Laroche, Bergeron and Barbaro-Forleo (2001) examined consumer segments willing to pay higher for eco-friendly products, considering factors such as perceived usefulness and environmental concern. Chang and Cheung (2001) applied the TAM model to understand the determinants of intention to use the Internet, showcasing applicability of perceived usefulness and ease of use in technology-related decisions. Global technological developments have brought an involution of today's young people which may affect the perception of using green products as well (Mateut, 2021).

Kim and Choi (2005) investigated the antecedents of green purchase behaviour, including factors such as collectivism, environmental concern, and perceived consumer efficacy (PCE), which are related to the perceived usefulness of green products. Customers who are certain for making sustainable choices in their ability to make sustainable choices are highly supposed to perceive green products as useful and align their behaviours accordingly (Vermeir and Verbeke, 2006).

They found that consumers perceive green products as useful when they offer tangible benefits such as energy savings, environmental protection, or health benefits. If users perceive a technology as useful, they are more likely to intend to use it (Davis, 1989). Vermeir and Verbeke (2006) integrated the TPB with sustainable food consumption and highlighted the role of perceived usefulness in shaping behavioural intentions. Consumers' positive perceptions of the usefulness of sustainable food products lead to higher intentions to use them. The perceived usefulness of green products can be influenced by individuals' confidence in their ability to make environmentally friendly choices (Vermeir & Verbeke, 2006).

Steg and Vlek (2009) provided an integrative review of encouraging pro-environmental behaviour, which included understanding the perceived usefulness of environmentally friendly products as a motivator for such behaviour. Biswas and Roy (2015) explored consumer behaviour towards green products in developing economies and highlighted the importance of perceived usefulness.

Hypothesis 3: *Green Perceived Value (GPV) has a significant positive influence on Attitude towards Using (ATU).*

Hypothesis 4: *Green Perceived Value (GPV) has a significant positive influence on Behavioural Intention (BI).*

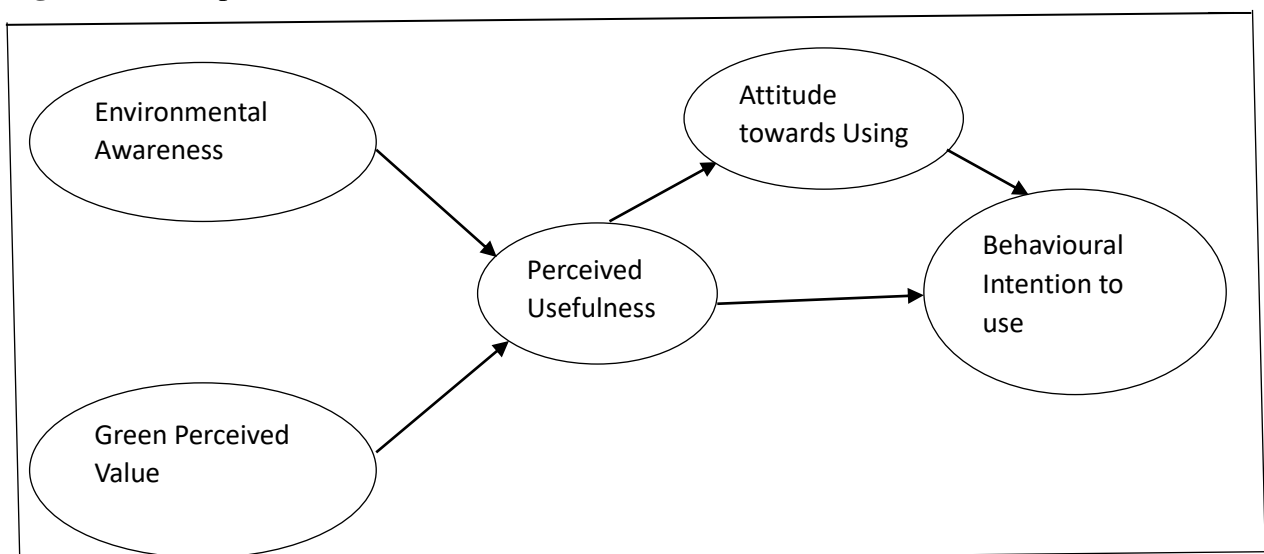
2.4 Attitude towards Using

Integrating environmental considerations into business strategy, including the use of green products and technologies, is essential for sustainable development and business success (Welford, 1999). Green marketing strategies play a vital role in influencing consumer perceptions and attitudes towards green products in India (Kumar, 2016). Life cycle assessment of products is crucial for understanding and mitigating environmental impacts, promoting the adoption of green products and technologies (Tukker, 2000). Consumers' attitudes toward using green products, were also portrayed for influencing their green purchase intention (Chan, 2001). Green product innovation is vital for companies to stay competitive and meet consumer demand for environmentally sustainable products (Dangelico & Pujari, 2010). Information and Communication Technologies (ICT) can play a significant role in reducing environmental footprints when designed and used efficiently (Bieser & Hilty, 2018). Rifa'I and Nuryakin (2020) in their study mentioned that attitude towards using has shown a mediating effect between perceived usefulness and behavioural intention. Companies are increasingly adopting green marketing practices such as eco-labelling, environmental certifications, and sustainable packaging to attract environmentally conscious consumers (Kumar, 2016). Further, social media marketing as a tool is used to attract target audience for different product use including green products (Kaur, 2023).

Hypothesis 5: *Attitude towards Using (ATU) has a significant positive influence on Behavioural Intention.*

Based on the extensive literature review, this study tries to present a comprehensive conceptual model (Figure 1) that delineates the interrelationships among environmental awareness, green perceived value, perceived usefulness, attitude towards using and behavioural intention.

Figure 1: Conceptual Model



3. Methods

Based on the literature review, the present study has taken the constructs including environmental awareness, green perceived value, perceived usefulness, attitude towards using and behavioural intention. The researcher has adapted questionnaire items from earlier studies as Environmental Awareness (Steg & Vlek, 2009), green perceived value (Riva, Magrizos, Rubel & Rizomyliotis, 2022), perceived usefulness (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989; Chen & Lu, 2016), attitude towards using (Amaro & Duarte, 2015) and behavioural intention (Yadav & Pathak, 2016).

Data collection involved the respondents who purchased any green products as classified earlier from tier-2 cities of north India. Data collection was done from September 2023 till November 2023. The research sample encompassed 260 respondents from diverse socio-economic backgrounds using researcher-controlled sampling. For data collection, 1000 questionnaires were distributed for data collection and research got only 260 questionnaires with response rate of 26 percent. The sample size is fully acceptable as per Hair et al. (2010) recommended for multivariate analysis.

3.1 Questionnaire development

The researcher has taken multi-item constructs (environmental awareness, green perceived value, perceived usefulness, attitude towards using and behavioural intention) from the previous literature. The survey consisted of 19 items representing the five dimensions, measured on a scale varying from one for "strongly disagree" to seven for "strongly agree". Data analysis has been carried out using SPSS 24.0. You may refer the **Table 1** for survey based questions and their questionnaire adaptations.

Table 1: Survey Instrument

Code	Dimension Items	Construct (Adapted Sources)
ENV1	Environmental pollution harms my health	Environmental awareness (Steg & Vlek, 2009)
ENV2	I am serious towards environmental problems	
ENV3	I consider that the environment is degrading	
ENV4	Environmental issues pose a threat to humankind's future.	
ENV5*	Regarding the future state of the environment, I am optimistic	
GPV1	The green products offer expected environmentally friendly characteristics	Green Perceived Value (Riva, Magrizos, Rubel & Rizomyliotis, 2022)
GPV2	The green products offer expected environmentally friendly characteristics	
GPV3	In terms of green features and value for money, the green product I buy is superior.	
ATU1	Using eco-friendly items is a wise move.	Attitude towards Using (Amaro & Duarte, 2015)
ATU2	Green product use is a smart move	
ATU3	Using green products is a practical idea	

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ATU4*	Using green products is an important idea	
BI1	I intend to shop for green products in the future	Behavioural Intention (Yadav & Pathak, 2016;)
BI2	In the future, using green products will be my first choice	
BI3	I am willing to shop for green products	
BI4*	I will consider purchasing green products if delivery is available in my area	
PU1	Green products' environmental performance can improve life quality;	Perceived Usefulness (Davis,1989; Davis, Bagozzi, & Warshaw, 1989; Chen & Lu,2016)
PU2	Using green products can make me healthier; and	
PU3	Environmental quality improves after using green products.	
Items with asterisk (ENV5, ATU4 and BI4) were deleted after poor factor loading during exploratory factor analysis.		

3.2 Data analysis

3.2.1. Sample attributes

The characteristics of the collected sample of 260 respondents have been portrayed below. There are 120 female respondents (46%) and 140 male respondents (~54%) in the sample. While portraying the monthly income, 20 (7.69%) respondents have their income less than €333, 50 (19.23%) respondents were in the range of income more than €333 and less than €666 and around 73 percent respondent were having income greater than €666.

The respondents' educational backgrounds were categorized as 115 (~44%) had completed their graduation, and roughly 145 (~56%) had completed postgraduate studies. Therefore, it shows the adequate representation of population in the sample.

3.2.2 Measurement Model

The exploratory and confirmatory factor analyses (EFA and CFA) were used to validate the conceptual model. Six iterations of Principal Component Analysis (PCA) with Varimax rotation were used to conduct the EFA. EFA is represented in the Conceptual model as a component matrix with five variables. Every item's cross loading is less than 0.49. The remaining factor loadings range from 0.59 to 0.852 as well. According to Hair et al. (2010), measurements of all commonalities are greater than 0.49, indicating that each item is related to a variety of other items. Additionally, the KMO value of 0.876 with 120 degrees of freedom indicates enough sampling for the analysis. Moreover, Bartlett's test for sphericity is absolutely significant. All the constructs can explain 71.25% variance of measurement model. Therefore, conceptual model has cleared the cutoff criteria.

In the second step, a CFA was conducted using maximum likelihood (MLE) method with the help of AMOS 24 package. The fit indices of conceptual model are within limits as under acceptable criteria. Conceptual model has shown a required criteria of fit ($\chi^2 = 164.993$, $df = 94$, $\chi^2/df = 1.755$, $CFI = .962$ $TLI = .89$, $RMSEA = .054$).

The composite reliabilities (CR) for each dimension have been portrayed in Table-2. According to Hair et al. (2010), the cutoff values for the following constructs are met by the CR values: attitude toward utilizing (0.789), perceived usefulness (0.812), green perceived value (0.866), behavioural intention (0.783), and environmental awareness (0.823). Additionally, the Average Variance Explained for each of the following constructs: behavioural intention (0.549), attitude towards using (0.558), perceived usefulness (0.593), green perceived value (0.684), and environmental awareness (0.541), was found to be greater than 0.5, indicating convergent validity (Hair et al. 2010; Henseler, Ringle & Sarstedt, 2014).

Table 2: Validity and Reliability Analysis

Item	Estimates	CR	AVE	MSV	EA	GPV	PU	ATU	BI	Constructs	
ENV2	0.812	0.823	0.541	0.393	0.736					Environmental Awareness (EA)	
ENV3	0.719										
ENV4	0.594										
ENV1	0.798										
GPV2	0.873	0.866	0.684	0.384	0.556	0.827				Green Perceived Value (GPV)	
GPV3	0.826										
GPV1	0.78										
PU2	0.88	0.812	0.593	0.32	0.536	0.497	0.77				Perceived Usefulness (PU)
PU3	0.738										
PU1	0.678										
ATU1	0.795	0.789	0.558	0.393	0.627	0.535	0.566	0.747			Attitude Towards Using (ATU)
ATU3	0.623										
ATU2	0.81										
BI3	0.812	0.783	0.549	0.384	0.536	0.619	0.51	0.515	0.741		Behavioural Intention (BI)
BI1	0.784										
BI2	0.612										

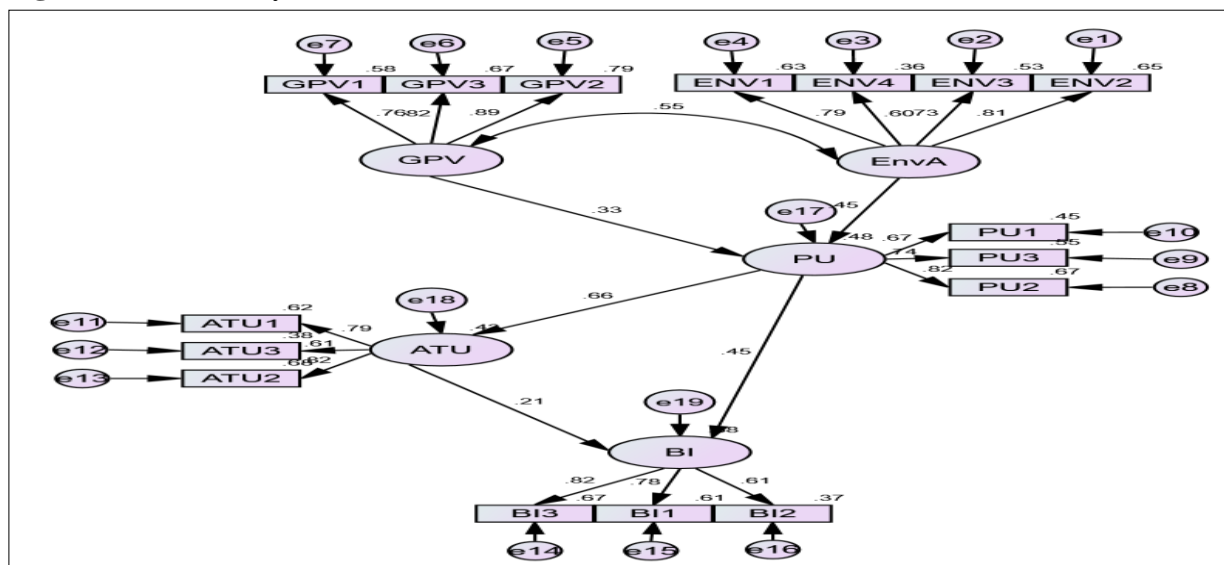
The correlation between "Green Perceived Value" and any other dimension is lower than the square root of AVE for that dimension. Comparably, for Environmental Awareness, perceived usefulness, attitude toward utilizing, and behavioural intention, the square root of average variance explained is larger than the correlation of these variables with any other construct, indicating sufficient discriminant validity.

4. Structural equation modelling (SEM) Results:

Structural Equation Modelling (SEM) is employed for multivariate data analysis for path analysis. SEM enables the researchers to assess the causal relationship between items and constructs as well as the inter-constructs average relationship. The path estimates for hypotheses testing have been calculated through AMOS 24.0 portrayed in figure-2, which shows the path estimates for the respective casual relationships. Further, the SEM model has been found a good fit as other statistics indicating values within limits ($\chi^2=232.086$, $df = 98$, $\chi^2/df=2.368$, $CFI= .929$, $RMSEA=.07$).

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Figure 2: SEM Analysis



Results of structural equation modelling have been indicated below in table 3. Indirect effects of these variables have been measured through the SPSS AMOS 24.0.

Table 3: Results of Structural Equation Modeling

Hypotheses	Estimates	C.R.	p- value
H1: Environmental Awareness → Perceived Usefulness	0.450	5.517	.000
H2: Green Perceived Value → Perceived Usefulness	0.334	4.330	.000
H3: Perceived Usefulness → Attitude towards Using	0.659	8.369	.000
H4: Perceived Usefulness → Behavioural Intention	0.451	4.372	.000
H5: Attitude towards Using → Behavioural Intention	0.214	2.136	.033

Source: By Researcher

Table 3 also displays the outcomes of the five hypotheses that this study put forth. According to Hypothesis 1, perceived usefulness is significantly positively impacted by environmental awareness. The findings show that Indians' perceived usefulness is significantly influenced by environmental awareness (beta = 0.450, $p < 0.00$). Therefore, results are consistent with hypothesis 1.

According to Hypothesis 2, perceived usefulness is significantly positively impacted by perceived green value. According to the findings, perceived usefulness is significantly impacted by green perceived value (beta = 0.334, $p < .05$). this results are in line with the previous study by Khan and Khan (2020). The outcome does lend credence to hypothesis 2. The third hypothesis examined how attitudes toward utilizing are greatly influenced by perceived usefulness. The analysis demonstrates a significant relationship between attitude toward using and perceived usefulness (beta = 0.659, p is less than 0.00).

Therefore, hypothesis 3 is supported by the results. Hypothesis 4 assumed that Perceived Usefulness exerts substantial impact on Behavioural Intention. The output of regression analysis explains that Perceived Usefulness shows significant influence on Behavioural

Intention ($\beta = 0.451, p < 0.00$). Thus, hypothesis 4 is supported. Hypothesis 5 demonstrates that Attitude towards Using impacts significantly on Behavioural Intention. The result shows that Attitude towards Using has no substantial effect on Behavioural Intention ($\beta = 0.214, p > .05$). Therefore, hypothesis 5 is not supported by results.

5. Conclusions

The primary purpose of this research was to assess the effect of environmental awareness and perceived usefulness on the intentions of individuals to use the green products in their day to day life. Additionally, we find out the role of attitude towards using as a mediating variable, between perceived usefulness of green products and behavioural intention to use and shop the green products. To explore the hypothesized relationships among these constructs, a study with a sample of 260 respondents from the customers who has prior experience of using green products was carried out. For structural equation modeling, AMOS 24.0 was employed as analytical tools. Notably, our results portrayed that environmental awareness and green perceived value positively influence the perceived usefulness of green products. Presently, there is a much more focus on sustainable consumption to promote the environmentally friendly practices all over the world. Therefore, customers are more aware to adopt such practices and find the green perceived value an important factor for perceived usefulness. Further, policies of all government are incorporating the use of green products so that little harm may be recorded to the environment and planet. Furthermore, our research contributes to the extant literature on TAM model by considering the perceived usefulness as a factor for behavioural intention to use the new products instead of technology. Research also suggests that policy makers should focus on increasing environmental awareness and enhancing the perceived value by cutting production and acquisition cost of green products. Collaborations between government bodies, industry stakeholders, and non-governmental organizations (NGOs) are essential for promoting the adoption and growth of green products in the Indian market as also opined by Joshi and Patel, (2020). Further, attitude towards using green products should be translated to behavioural intention to use the products. Future research may be conducted to incorporate other important factors like customer satisfaction and customer loyalty.

The limitation of the study is that researcher has assessed green purchase intention in a developing country i.e. India. Hence, the results of this study may lack generalization for other developed regions of the world but results are still insightful in assessing green purchase intention.

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THE IMPORTANCE OF EU-FUNDED PROJECTS FOR THE SUSTAINABLE DEVELOPMENT OF LOCAL COMMUNITIES

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Abstract: *Sustainable development has been one of the core strategies of the EU. The term refers to three basic components: the economic component, which is associated with balanced growth, the environmental component which refers to the preservation of the ecosystem, and the social component, which guarantees inter- and intra-generational equality. While talking about sustainability it is important also to tackle the topic of circular economy. The circular economy aims to preserve value by designing out waste and pollution, optimizing resources by keeping products and materials in use, and ensuring system effectiveness by regenerating natural systems. One of the strategies of the EU to achieve sustainable development and the move towards a circular economy is to support it through various EU-founded projects. In this article, we will elaborate on the current state of sustainable development of EU-founded schemes and how they can be used for different projects for local communities and cities since cities are seen as both the source and solution to today's economic, environmental, and social challenges. Furthermore, in the article, we will outline some best practices of EU-founded projects around sustainable development in the case of the city of Maribor, Slovenia, and indicate their importance for its community.*

Keywords: *sustainability, circular economy, EU, funds, projects, local communities, Maribor.*

1 INTRODUCTION

Sustainable, ecological, green, eco-friendly, etc. are terms used in our everyday lives, practically on a daily basis. These terms are all synonyms of each other. Sustainability is often referred to as “sustainable development” (EC, 2022b), which means meeting our own needs without compromising the ability of future generations to meet their own needs. It includes three pillars: economic, environmental, and social. Sustainability more in detail implies a link towards environmental impacts; in other words, the consumption of natural resources and the deliberation of pollution and energy use, the concern of economic themes of growth and durability, additionally connected to social inclusion and distribution of wealth (Musgrave & Raj, 2009). To achieve sustainability, the following contemporaneous achievements are necessary (Purvis et al., 2019):

- *Environmental sustainability* refers to the conservation and responsible management of natural resources (primarily non-renewable as well as vital for the maintenance of life, such as air, water, and land) where it is important to minimize pollution and protect the environment.
- *Economic sustainability* refers to creating prosperity at different levels of society, through the long-term sustainability of enterprises and other related economic activities.

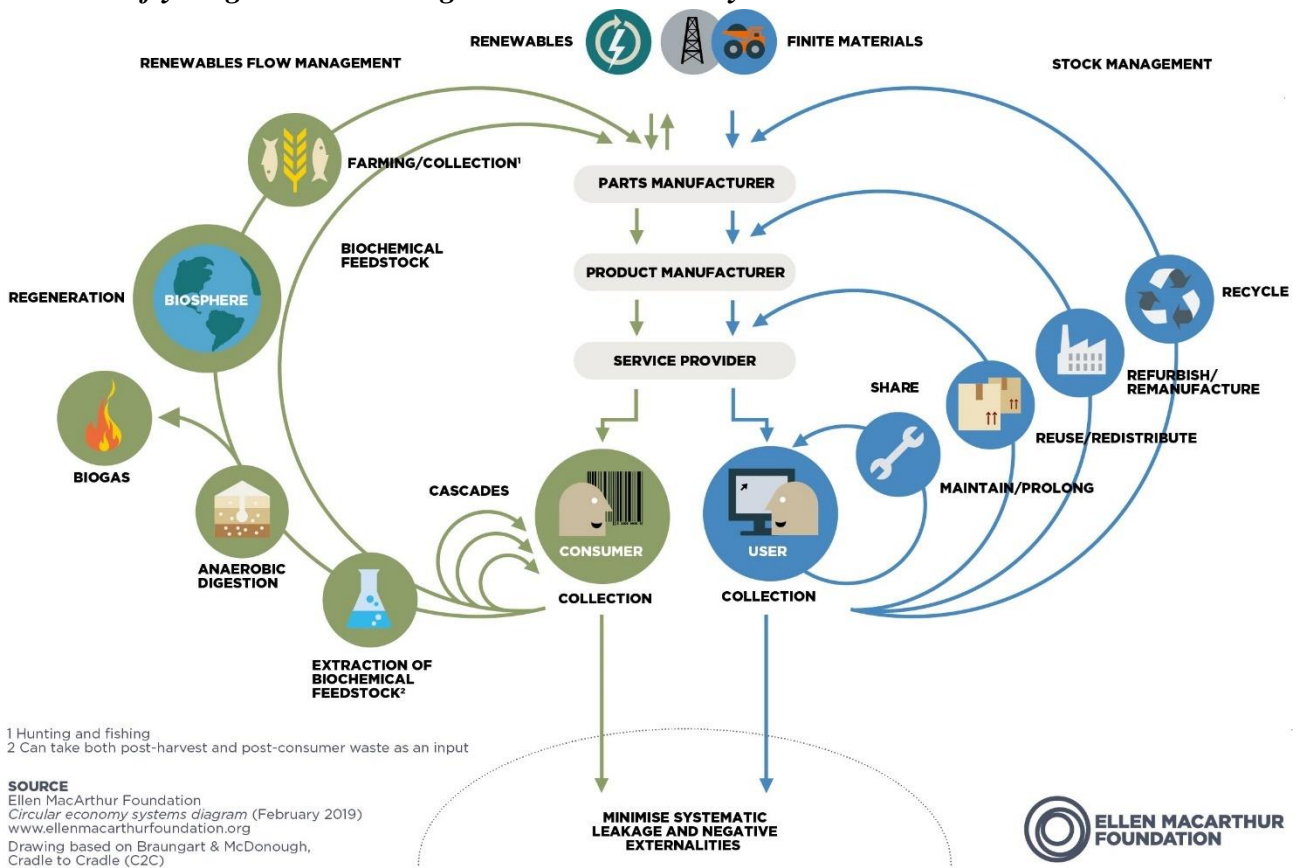
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- *Social sustainability* implies an equitable distribution of benefits, as well as respecting human rights and maintaining and strengthening local communities.

While talking about sustainability it is important also to tackle the topic of circular economy. The circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended. As defined by the Ellen MacArthur Foundation (2015), a circular economy aims to preserve value – by designing out waste and pollution, and optimizing resources – by keeping products and materials in use and ensuring system effectiveness by regenerating natural systems. The efficient (re)use and recycling of resources, materials, and products from closed loops represents the transition away from consumption- and disposal-based linear models. The Ellen MacArthur foundation designed the infographic below to show how the circular economy works (Scheme 1).

Scheme 1

The butterfly diagram: visualising the circular economy.



Source: Ellen MacArthur Foundation (2019).

Currently, about 85% of global GDP is generated through cities. Such rapid growth puts enormous pressure on urban resources, carrying capacities, and quality of life. Simultaneously, about 70% of the energy is used by cities and the proportion of the world’s population living in urban areas is expected to increase, reaching about 70% by 2050. Quantitative analysis of the global resource requirements of future urbanization shows that material consumption by the world’s cities will grow from 40 billion tonnes in 2010 to about 90 billion tonnes by 2050 (EC, 2020b).

Cities and regions play an important role in making the circular transition happen, as they are at the centre of key decisions determining economic growth, social well-being, and environmental benefits. On the one hand, cities and regions have direct competences in key circular economy sectors such as buildings, mobility, and waste management, among others. On the other hand, cities and regions are also directly connected to local networks. As a result, they are in a special position to channel local resources for the deployment of circular innovations along the value-chain of priority sectors and products. For cities and regions, the circular economy represents an opportunity to rethink production and consumption models, services, and infrastructure to enable long-term value retention of products and materials, increase resource productivity and further capture value after product end-of-life. In this context, the transition to a circular economy requires a systemic change where provision of services is carried out by ensuring an efficient use of primary resources and giving priority to their reuse; economic activities are planned from a life cycle perspective and carried out in order to close, slow and narrow loops across value-chains and infrastructures are designed and built to avoid linear locks-in (OECD, 2020).

There are special funding opportunities for cities and urban areas within the EU, to support cities and regions in their transition to sustainable development and circular economy, since one of the strategies of the EU is to achieve sustainable development and the move towards a circular economy. The goal of the research in this article is closely related to the previously mentioned sustainable development and EU funds correlated to this topic. It wants to prove that EU-founded schemes can be used for different projects for local communities and cities in that field and support the move to a greener EU.

1. 1 Sustainable development, and circular economy – the focus of the EU

In December 2015, the European Commission put forward a Circular Economy package containing an action plan and legislative proposals on waste management. This was then adopted in 2018.

The European Commission adopted the new circular economy action plan (CEAP) in March 2020, which aims to promote more sustainable product design, reduce waste, and empower consumers, for example by creating right to repair) (EC, 2020a). There is a focus on resource intensive sectors, such as electronics and ICT, plastics, textiles, and construction. It is one of the main building blocks of the European Green Deal, Europe's new agenda for sustainable growth (European Parliament, 2023a). In February 2021, the Parliament adopted a resolution on the new circular economy action plan demanding additional measures to achieve a carbon-neutral, environmentally sustainable, toxic-free, and fully circular economy by 2050 (EC, 2023b).

The European Green Deal sets the blueprint for a transformational change. A change which will bring with it many benefits, from creating new opportunities for innovation, investment, and green jobs, to improving health and wellbeing. All 27 EU Member States committed to turning the EU into the first climate neutral continent by 2050. To get there, they pledged to reduce emissions by at least 55% by 2030, compared to 1990 levels. The EU now has legally binding climate targets covering all key sectors of the economy. The overall package includes (EC, 2023b):

- emissions reduction targets across a broad range of sectors;
- a target to boost natural carbon sinks;
- an updated emissions trading system to cap emissions, put a price on pollution and generate;

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- investments in the green transition;
- and social support for citizens and small businesses.

The EU's new circular action plan paves the way for a cleaner and more competitive Europe. The EU's transition to a circular economy will reduce pressure on natural resources and will create sustainable growth and jobs. It is also a prerequisite to achieve the EU's 2050 climate neutrality target and to halt biodiversity loss. The new action plan announces initiatives along the entire life cycle of products. It targets how products are designed, promotes circular economy processes, encourages sustainable consumption, and aims to ensure that waste is prevented, and the resources used are kept in the EU economy for as long as possible. It introduces legislative and non-legislative measures targeting areas where action at the EU level brings real added value. The key objectives are (EC, 2023a):

- make sustainable products the norm in the EU;
- empower consumers and public buyers;
- focus on the sectors that use most resources and where the potential for circularity is high such as: electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, water and nutrients;
- ensure less waste;
- make circularity work for people, regions and cities;
- lead global efforts on circular economy.

The European Union is providing several funding programs to support the transition to a circular economy, to support sustainable development, and green transition. In Scheme 2 the committed funds until 2020 are presented, as well as the estimated funding need. This shows the importance of the needed change towards sustainability and circularity for the EU.

Scheme 2

European Union committed funds until 2020.



Source: European Parliament (2023b).

The importance of sustainable development for the EU is shown also in the context of supporting EU candidate countries in their sustainable development. For example, for Montenegro, the EU is combining the resources of the European Union, assisting the institutions at all levels, the business community, civil society, and citizens as well as supporting sustainable development with EU funds. In the past 3 years, the EU contributed 15 million USD in investments to advance the sustainable development goals (United Nations Montenegro, 2024). In recent years, Montenegro has fulfilled some of the conditions that bring it closer to the proposal of sustainable development (Smolović et. al, 2023): legislation is being developed, a critical mass of knowledge has been reached, and the behavior of entrepreneurs is also changing. This is possible only in the interdisciplinary way of solving problems and should be applied here also in the future. One of the ways to do it is by participating in EU-funded projects, as well as with different knowledge transfer activities as observing partners in such projects.

1. 2 EU funding programs for sustainability, circular economy, and green transition

The European Union is providing several funding programs to support the transition to a circular economy, such as the European Structural and Investment Funds, Horizon 2020, and the LIFE program. In addition, the European Investment Bank (EIB) is providing finance and advice for circular economy projects through the InvestEU Advisory Hub (EU 2019).

The three principal funding instruments for the transition to a circular economy include: shared management funds, the Horizon Europe program, and the LIFE program (OECD, 2023).

Shared management funds are EU funds that are shared with Member States and regions. These include:

- the European Structural and Investment Funds (ESI funds), in particular, the European Regional Development fund (ERDF),
- the European Social Fund Plus (ESF+),
- the Cohesion Fund (CF),
- and the Just Transition Fund (JTF).

Horizon Europe is the EU's Research and Innovation program with a budget of nearly EUR 100 billion, running until 2027. This includes almost EUR 5.5 billion from the NextGenerationEU (NGEU) instrument to support greener, digitalized, and more resilient societies and economic recovery from the COVID crisis. The budget is divided among 4 pillars and 15 components to support several areas of research and innovation (R&I).

The LIFE programme is the EU's funding instrument for the environment and climate action with a budget of EUR 5.4 billion for the funding period 2021-2027. It has four sub-programs, one of which covers the circular economy. The "Circular economy and quality of life" sub-program co-finances projects in circular economy, including the recovery of resources from waste, as well as projects concerning water, air, noise, soil and chemical management, and environmental governance.

Other financing opportunities at the EU level for the circular economy transition are (OECD, 2023, AAL Programme, n. d., EC, n. d.):

- *Interreg* is a funding instrument to support cross-border, transnational, and interregional cooperation, as well as for outermost regions. It seeks to tackle common challenges and find common solutions in several areas.

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- *The New European Bauhaus (NEB)* is a creative and interdisciplinary initiative connecting the European Green Deal to living spaces and experiences.
- *The Innovation Fund (IF)* targets the commercial demonstration of innovative low-carbon technologies.
- *The Digital Europe Programme (DIGITAL)* is a new EU funding programme. It aims to accelerate economic recovery and shape the digital transformation with its focus on businesses (especially SMEs), citizens and public administrations.
- *AAL programme* is a funding program that aims to create a better quality of life for older people and to strengthen industrial opportunities in the field of healthy aging technology and innovation.
- *The Erasmus+ programme*, along with the well-known learning mobility of individuals and cooperation between organizations and institutions, also enables support for policy reform (including the field of education and sustainable development policies).

There are special funding opportunities for cities and urban areas, such are:

- *European Urban Initiative*, which supports urban areas of all sizes with innovative actions, capacity and knowledge building, policy development, and communication on sustainable urban development (European Urban Initiative, n. d.).
- *URBACT*, which drives change all over Europe by enabling the cooperation and idea exchange amongst cities within thematic networks, by building the skills of local stakeholders in the design and implementation of integrated and participatory policies, and by sharing knowledge and good city practices (URBACT, n. d.).
- *EIT Climate-KIC* is Europe's leading climate innovation agency and community, supporting cities, regions, countries, and industries to meet their climate ambitions through systems innovation and place-based transformations (EIT Climate-KIC, 2024).

When deciding how to choose the right program, it is important to contemplate the following:

- What is the central topic of the project?
- What is the main objective and purpose of the project?
- What is the funding for (knowledge exchange, financing of innovative investments, education, etc.)?
- What kind of partnership will be established: national or international partnerships?

Only by answering these questions, the proper decision about the suitable funding program for applying one's project idea can be made.

2 METHODOLOGY

The content of the first chapters of the paper is the needed desk-research to understand the topic and understand the background of EU-funded projects. This helps also cities and regions, at the local level, while preparing their sustainable strategies and applying for EU funds: mostly with case study research, record keeping, and qualitative observations. In this chapter, the following scientific research methods were used in the processing of the topics discussed in this paper in appropriate combinations: methods of abstraction and concretization, methods of generalization and specialization, qualitative research involving collecting non-numerical data, observations, and case study research on the selected topic, as well as methods of analysis and synthesis in determining the

appropriate necessary knowledge of sustainable development and applying it to the EU-funded projects in the case of the city of Maribor.

Based on the beforementioned content analysis and thematic analysis of the field of sustainability, circular economy, cities' involvement in the topic, and EU funding opportunities, we analyzed several different Circular Economy Initiatives at city levels described and presented online (Amsterdam, Barcelona, Copenhagen, Helsinki, London, Maribor). These initiatives are often the starting point of the circular transition of cities or regions and the baseline for projects' applications. Further, we will outline some best practices of EU-funded projects around sustainable development and indicate their importance for further development in the example of the city of Maribor, based on the expert experience as well as firsthand experience of the author, who is also working in the field of sustainable development, circular economy, and green transition through EU-funded projects.

Together we looked at 25 different EU-funded projects carried out in the city of Maribor in the period from 2016 to 2024, which have an emphasis on sustainability, circular economy, and green transition in practice (RRA Podravje – Maribor, n. d.). Based on that we decided to present the following 3 (describing the cornerstones for the circular economy in the city of Maribor, Slovenia):

1. The *GREENCYCLE* project laid the foundation for the circular economy transition in Maribor since one of the outcomes was the Strategy for the Transition to a Circular Economy in the Municipality of Maribor. This is one of the corner documents for EU projects' applications for projects in Maribor and presents an important milestone in the city's transition from linear to circular economy.
2. The *CINDERELA* project was the first Horizon 2020 funded project in the field of circular economy in Maribor. The aim of the project was to create ways to process construction waste and demolition waste, which together with waste from industry, municipal services, and others, form excellent secondary raw materials for construction work. Also, the author worked on the project as part of the project management team and has firsthand experience with the mentioned project.
3. The *CITY WATER CIRCLE* project focused on the urban circular water management. The project enabled a digital learning center for anyone who wants to handle water more sustainably. Smaller pilots were also part of the project, whereby Maribor's pilot and an exceptional added value to the project since it was done in correlation with the acquired *CINDERELA* project. Also, the author worked on the project as part of the project's stakeholder group and has firsthand experience with the mentioned project.

3 RESULTS - BEST PRACTICES OF EU-FUNDED PROJECTS FOR THE SUSTAINABLE DEVELOPMENT OF LOCAL COMMUNITIES

The starting point of the circular transition of cities or regions and the baseline for EU projects' applications are often Circular Economy Initiatives. These are prepared by cities and regions and are the basis for a sustainable circular economy and on the other hand, are supporting the transition to circular economy. In this chapter, we will take a look at some of them.

Furthermore, we will look at some examples of EU-funded projects for the sustainable development in the city of Maribor, Slovenia, and how they influenced the transition to sustainable development and circular economy of the city.

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3.1 Circular economy initiatives at the local level

In previous years, several cities and regions in Europe have defined their own Circular Economy Initiatives to set the basis for sustainable circular economy and ecosystems and to make the transition circular economy. In Table 1 selected circular economy initiatives are listed (only EU).

Table 1

Selected circular economy initiatives at the local level in EU cities.

City	Initiative
Amsterdam (Netherlands)	Amsterdam Circular 2020-2025 Strategy Building Blocks for the New Strategy Amsterdam Circular 2020-2025 (2019) The Amsterdam City Doughnut. A Tool for Transformative Action
Barcelona Metropolitan Area (Spain)	Circular Economy Promotion Program AMB Circular (2019)
Copenhagen (Denmark)	Circular Copenhagen: Resource and Waste Management Plan 2024 (2019)
Helsinki (Finland)	City of Helsinki's Roadmap for Circular and Sharing Economy (2020)
Lappeenranta (Finland)	City of Lappeenranta Circular Economy Roadmap 2019
London (United Kingdom)	London's Circular Economy Route Map (2019)
Maribor (Slovenia)	<i>Strategy for the Transition to a Circular Economy in the Municipality of Maribor (2018)</i>
Murcia (Spain)	Assessment of the State of Circular Economy in Murcia (2020)
Nantes Metropolitan Area (France)	Circular Economy Roadmap Nantes (2018) (Feuille de route Economie circulaire Nantes Métropole)
Paris (France)	Circular Economy Plan 2017-2020 (2017) 1st Roadmap Paris Circular Economy Plan (2017) 2nd Roadmap Paris Circular Economy Plan (2018)
Turku (Finland)	Turku Resource Wisdom Roadmap 2015-2040
Valladolid (Spain)	Valladolid Circular Economy Roadmap (2017-2018)

Source: Adopted by OECD (2020).

The circular economy transition calls for cooperation between stakeholders and citizens, across levels of government and public offices. Cities and regions can play the role of facilitators by (OECD, 2020) i) implementing effective multi-level governance coordination; ii) enhancing policy coherence and systemic thinking; iii) fostering stakeholder engagement, and iv) adopting a functional approach to identify the appropriate scale for action. Implementation of EU projects is one of the core activities in the circular economy transition and enables especially smaller cities and communities the funds needed to "start the work".

3. 2 The example of the city of Maribor, Slovenia

Projects funded by the EU budget cover a wide variety of areas and topics. Their impacts are all around us and their effect on our lives are felt daily. This is also the case in the city of Maribor, Slovenia. Also, as already mentioned, the city of Maribor introduced its Strategy for the Transition to a Circular Economy in the Municipality of Maribor in 2018 and was the first city in Slovenia to have such a strategy and was also among the first cities in the EU. In the past years, this strategy was a foundation and a baseline for different EU project applications in the field of sustainability and circular economy, which were successfully implemented.

Based on past projects, initiatives, and actions the city of Maribor, is one of the pilots in the CCRI Pilots. The Circular Cities and Regions Initiative (CCRI) is an initiative of the European Commission that contributes to achieving the goals of the European Green Deal (EC, 2022a). In 2022, a call was made within the framework of CCRI, where the Podravje region (with the city of Maribor) was one of a total of 12 cities and regions in Europe that will receive support in the implementation of Circular Systemic Solutions (CSS) as part of the initiative and transfer their knowledge to other cities in regions on that topic in EU and outside EU borders.

The journey of the city of Maribor towards a circular economy started with the *GREENCYCLE* project (Alpine-space, n. d.), funded through Interreg Alpine Space. The work in the project included professional and technical support in the preparation and adoption of the local strategy and action plan for the circular economy, as well as professional and technical support in the implementation of the pilot project and the establishment of a common digital platform. The Strategy for the transition of the City of Maribor to the circular economy was prepared and presented in 2018 and made Maribor the first city in Slovenia to have such a strategy, as well as being among the first cities in Europe with such a strategy (RRA Podravje – Maribor, n. d.).

The first Horizon 2020 project in the field of circular economy in Maribor was the *CINDERELA* project (CINDERELA, n. d.). The project addressed the challenge of construction waste by assessing the urban waste to resource opportunities, development, and testing of new SRM-based construction materials and their application in large-scale demonstration pilots to develop a pan-European pool of knowledge and showcase good practices essential to help construction companies build circular economy business models. SRM are secondary raw materials, materials, resulting from a recovery process, which becomes an input or new 'raw' material in the same or different new production from which it was generated. The partner of the project is the Maribor communal company Nigrad, a utility company; established in 1875 in the Municipality of Maribor as a fundamental maintenance and construction company. Nigrad has been an important partner of the Municipality of Maribor, acting especially intensely in the field of the use of secondary raw materials and in bringing new, innovative technologies and processes to the construction sector in the city. Nigrad participated in the Horizon 2020 project CINDERELA. As part of the pilot demonstrations of the project, the pilot production plants in Maribor (Slovenia), Madrid (Spain), and Skopje (North Macedonia) were established. With the pilot production plants, the project aimed to demonstrate the technical, technological, and administrative possibilities of processing and using various non-hazardous construction waste as well as some other waste types to produce more sustainable construction products. Following the pilot production, the SRM-based products played an important role in the construction demonstration where project partners revitalized degraded areas and built small facilities with accompanying access roads. However, as the waste is not suitable for direct use in construction

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projects, it must be re-processed (RRA Podravje – Maribor, n. d.). The outcomes of the CINDERELA project are now used as a foundation for further research in the *LIFE IP RESTART* project (Life-Restart, n. d.), whose main objective is to implement a comprehensive set of complementary technical, digital, environmental, social, and circular solutions to realize the full potential of the program, achieve maximum material self-sufficiency, and increase the circular return in the waste and resource sector.

Water being an important issue in sustainable development and circular economy had to be addressed in the city of Maribor. This was done through the *CITY WATER CIRCLE* (Interreg Central Europe, n. d.), an Interreg Central Europe project, where Maribor Water Supply Utility was a partner (RRA Podravje – Maribor, n. d.). Climate change also creates hydrological risks and urban cities are increasingly vulnerable to flooding. The consumption of drinking water is increasing, and as a result, the amount of wastewater that needs to be treated is also increasing, all of which threatens the security of future water supplies. The *CITY WATER CIRCLE* project helped municipalities (among which was also Maribor) reform outdated urban water infrastructure systems using a circular economy approach that offered many economic and environmental benefits. Within the framework of the project, the promotion of a culture of saving water, including the use of non-conventional water sources was done. Smaller pilots were also part of the project, whereby Maribor's also had its pilot. The pilot action demonstrated the potential of using treated wastewater and rainwater to produce SRM-based construction products. Rainwater was harvested and stored and treated wastewater was transported from the nearby wastewater treatment plant. Materials produced from recycled water were used for road maintenance works and to revitalize degraded areas by Nigrad. The quality of the reused water was tested for its suitability for the SRM production process, and it was confirmed. The pilot is still at Dogoše (Nigrad's pilot site for EU projects), where also pilots of the CINDERELA projects are and where other EU project pilots are demonstrated. Dogoše site is now a learning center for sustainable development projects not only in Maribor but in Slovenia itself.

4 DISCUSSION AND CONCLUSIONS

Sustainability as a mega trend occurs in every segment of our lives and is promoted highly in the EU. The EU has action plans, initiatives, programs, and legislatives to support sustainable development and the green transition. One of the strategies of the EU to achieve sustainable development is to support it through various EU-founded projects. Cities and regions play an important role in making the circular transition happen, as they are at the center of key decisions determining economic growth, social well-being, and environmental benefits. So, there are also special funding opportunities and schemes only meant for cities and regions, like the European Urban Initiative or URBACT.

In the article, we outlined some possibilities for EU-founded projects around sustainable development and which funds are suitable for certain areas. It is important to start the work in the field of sustainability and circular economy with the preparation of Circular Economy Initiatives. These are prepared by cities and regions and are the basis for a sustainable circular economy and support the transition to a circular economy, and on the other hand, they are a positive input in EU funded projects' applications.

The example of the city of Maribor, presented in the paper, furthermore, outlined the use of several EU funds for different areas to not only start the circular and sustainable transition but

successfully work on it. It all started with the Strategy for the Transition to a Circular Economy in the Municipality of Maribor in 2018, Maribor being the first city in Slovenia to have it and started to implement it. The example of Maribor proves that EU-founded schemes can be used for different projects in the local communities to promote and support sustainable development and how, furthermore, problem-solving thinking and complementation of different knowledge areas, as a superstructure of project ideas can drive not only different projects but the green transition in a city.

The activities of transferring knowledge and good practices in the field of circular economy and increasing the capacity of the city in this area, as well as assistance in the preparation of strategic documents of the circular economy could be provided with different partnerships with other cities by the city of Maribor. If nothing else, at least other cities can take the presented projects in the paper as examples of good practice, and they can learn something based on the previous projects and studies of the city of Maribor.

With this paper, we want to advance the understanding of sustainable development and circular economy and the way research and funding for such projects have advanced. It is important to think about how cities and regions can contribute to sustainable development. It is better to invest time, effort, and money in sustainable development now than delaying it and having the “status q” still for some time or ether fighting it since even bigger challenges in correlation with higher costs of the transition to a green economy will for sure occur in the future. In any case, with the help of the EU through various schemes and funding opportunities, municipalities and regions can at least partially finance their green transitions.

In the past, some research was done, on what impact different EU policies have on the development of countries, regions, and cities. Bradley (2006) evaluated the impact of European Union Cohesion policy in less-developed countries and regions. This research suggests that the ‘macro-models’ can extract the pure Structural Funds policy impacts from the background of all the other domestic and external shocks that affect the economy at the same time. Cristofolletti et. al (2024) identified the Cohesion Policy as a multidimensional treatment composed of Hard (infrastructures) and Soft (business and technical support) investments. By applying a generalized propensity score analysis in a multiple continuous treatment scenario, they estimated how the Cohesion Policy impact in terms of regional economic growth depends on how the investments of the two fields are mixed. They found that when the expenditure is polarized toward one of the two fields, positive impacts are generated only when this field is the Soft investments. When only a limited part of the budget is allocated to Soft investments, also Hard investments deliver negligible (or even detrimental) impact. In the presence of consistent Soft investments, Hard investments also become impactful. However, there is still some empirical and data research missing in this field on what impacts other EU-funded projects have on the sustainable development of cities and regions, which is a good starting point for further research.

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IMPLEMENTATION OF HOTEL REVENUE MANAGEMENT STRATEGIES DURING A MARTIAL LAW

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Abstract: *The Hotel Revenue Management strategy is used to measure the future occupancy, ADR, REVPAR, TREVPAR. Prices impact on the further development of business models implemented by the hotels is analysed. The purpose of this study is to determine the influence of Revenue Management Strategy on KPI and Revenue indicators at hotels in Ukraine. The research method used is a quantitative descriptive research method. The study used a sample of 12 respondents with 8 statements. Data were collected by observing participants, reviewing company documents, and seeking input from key informants. In crisis conditions, in particular caused by martial law in Ukraine, hotels reorient themselves to new segments, study needs and adapt services to new security requirements. One of the ways to increase efficiency and occupancy can be revenue management strategies adapted to crisis or post-crisis situations. We have proposed a typology of income management strategies adapted to new conditions.*

Keywords: *Revenue management, strategy, hotels, occupancy, ADR, REVPAR.*

INTRODUCTION

The full-scale invasion and imposition of martial law has had a significant impact on the hotel industry in Ukraine, leading to significant revenue losses in the tourism industry as a whole. Analysing the dynamics of tax revenues before and during the introduction of martial law, according to research published in 2024, the Ukrainian tourism industry demonstrates uneven fluctuations in tax revenues from the tourism industry by region for 2021-2023. The report showed that the growth of taxes in 2023 compared to 2022 was observed in the capital and in 18 regions of Ukraine. However, in comparison with the same period of the previous year, only 13 regions of the country showed an increase. In addition, the largest decline in tax revenues from the tourism industry was recorded in four regions of Ukraine that are in the area of active hostilities. Thus, the decline in Kherson region amounted to 84%, in Luhansk region 74%, in Donetsk region 53%, and in Zaporizhian region 42%. Despite these challenges, the hotel and tourism industries are showing signs of recovery. According to forecasts, in 2025, 35

new hotels will be commissioned, creating new jobs and generating tax revenues. According to the Hotel Matrix report (Hotel Matrix, 2023) "Ukrainian Hotel Market in 2021-23. Trends 2024", it is expected that new destinations and services in hotels will increase occupancy and reorient to new segments in the markets of Kyiv, Lviv and Bukovel. The hospitality industry has been and remains one of the most affected industries in times of uncertainty, first facing quarantine restrictions related to the Covid-19 crisis, today martial law has led to the need for many hotels to suspend their operations (Zhuravka, Nebaba, Yudina, Haponenko & Filatova, 2023). Due to the closed airspace, the hotel industry, with its extension to the travel industry, has suffered huge losses from 2022 to the present (UHRA, 2022). Since 2012, the hotel industry in Ukraine has become an important component of the Ukraine's state socio-economic development model. From an economic point of view, the construction of five-star hotels and the development of outbound tourism have led to tourism and the hotel industry becoming strong points of development and economic growth for most regions of the country. Several authors have used and discussed the crisis effect on hospitality industry, referring to different countries (Breier et al., 2021; Crespi-Cladera et al., 2021; Dimitropoulos, 2018; Gehrels et al., 2013; Kapiki, 2012; Lee et al., 2024). The positive impact of implementation the anticrisis strategies has been to create new jobs and reduce unemployment (del Mar Alonso-Almeida & Bremser, 2013).

An important task in a crisis is to find new and innovative ways to implement changes. Adapting all sectors to the conditions of accelerated development requires understanding of certain aspects. In particular, among the attributes of the modern economy that indicate the nature and direction of its transformation processes, the term "digital" is often used.

The modern economy is called digital because, in today's conditions, a part of the economic result is obtained exclusively or mainly from digital technologies or using a business model based on digital goods or services (Bukht & Heeks, 2017). The driving forces behind digitalization are economic and political, but of course it is also driven by technological innovation. Technological innovations are an important resource for enterprises, and the development of new information technologies is quite rapid. In the 1990s, economic changes were mainly associated with the emergence of the Internet, which led to the development of the digital economy.

During the 2000s and 2013s, new information and information and communication technologies (ICTs) contributed to the spread and diffusion of economic change. From 2014 to 2022, the Digital Economy and Society Index (DESI) summarized the digital performance of Europe and tracked the progress of EU countries (Bureau of Economic Analysis, 2023). According to this index, most European countries have reached a high level of digital economy development and have developed strategies to secure their future. The Bureau of Economic Analysis (BEA) defines the digital economy primarily in terms of the Internet and related information and communication technologies (ICT) (Bureau of Economic Analysis, 2023). The BEA measures the digital economy in terms of GDP, value added, employment, and wages. The digital economy is seen as a way to promote high-quality regional development, and the necessary integration of the Internet, BigData, artificial intelligence and the real economy (European Commission, 2023). Thus, the main features of the digital economy were presented by Erkin To'rayev Eshkabilovich (2023) in the form of a chain reaction: high level of use of

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technological innovations; embedding of connected sensors in more and more objects (Internet of Things); market saturation with new devices for end users (mobile phones, smartphones, tablets, netbooks, laptops, 3D printers); oversaturation of the information space with data using a new digital model (cloud computing, digital platforms, digital services); spread of Big Data, data analysis and algorithmic decision-making; process automation and robotics technologies.

METHODS

Sample and population

Managers of all 5, 4 and 3-star hotels in Kyiv, Lviv, Odesa and Bukovel were invited to the survey. The final mailing list included 120 e-mail addresses, of which 32 hotel managers responded to the survey, representing 26.7% of the total sample. In the last sample, 37.5% of managers confirmed that they use the revenue management system in their work and agreed to an interview to determine the factors affecting revenue management under martial law. According to the entire population of certified hotels (DART, 2021), the sample can be considered representative of the market of hotel services in Ukraine.

Data Collection Process and Methods

The quantitative empirical study was conducted in late 2022 and early 2023, i.e., during the period of martial law in Ukraine. The questionnaire was developed in accordance with the specifics of hotel operations under martial law, considering the peculiarities of different categories of hotels and the use of the revenue management system to improve performance.

The study used two stages of research: during the first stage the 32 survey answers were conducted and during the second stage 12 respondents were interviewed with 8 statements. Data were collected by observing participants, reviewing company documents, and seeking input from key informants.

RESULTS

The use of a revenue management system is important to achieve effective hotel management and improve its performance. Digitalization processes used to optimize data processing affect efficiency at many levels, from individual to strategic, and are important for both enterprises and the economy as a whole. It is worth noting that revenue management, according to most authors, is a system of processes and practices aimed at achieving better results and increasing revenues and profitability (Ortega, 2016; Piga et al, 2021; Radwan, 2017). The transformation of digital technologies into one of the most important resources of an enterprise has become possible due to the globalization of the information technology market. The need for information support for effective enterprise (process) management has always existed, but the possibility of virtually unlimited access to a large number of information sources and adequately fast filtering, systematization and analysis of the data obtained has emerged due to the emergence of modern software products and information networks. This leads to two conclusions: first, the globalization of markets for any other goods would be impossible without the processes that have already taken place in the information market; second, the level of use of information technology is a kind of indicator of the level of competition and globalization of a particular market.

The positive dynamics of recovery of key performance indicators of the revenue management in the conditions of crisis and uncertainty, as well as intensive integration processes taking place in the global hotel services market since the 80s of the twentieth century, indicate, on the one hand, a high level of economic attractiveness of the hospitality sector, and on the other hand, the growth of competition and the need to ensure sustainable development and strong competitive positions for the market players. The hotel industry in Ukraine is increasingly integrating into the international economic space, which, on the one hand, leads to an increase in the volume of services and supply in the market, and on the other hand, may lead to the takeover of national hotel companies by international chains. In today's environment, when the struggle for a guest is no longer between individual hotel companies or even between chain establishments, but between hotels of international operators, the problem of developing and implementing methods that will allow hotel companies to operate efficiently and maintain their competitive position has become particularly acute.

The change in indicators during martial law shows positive dynamics in 2023 in three of the four regions studied as it is presented in Table 1. As shown in the table, since the beginning of the full-scale invasion, hotel performance indicators have almost been halved in Kyiv and Odesa, as these cities were regularly under missile attack and the threat of further military offensive remained. Lviv and Bukovel were considered safer regions and also became places of shelter for internally displaced people, so the performance remained approximately at the pre-war level and even improved.

Table 1
Key revenue management indicators of four regions in Ukraine about the YoY analysis during martial law

Region	Indicators	2021	2022	2023	2022 over 2021 Growth	2023 over 2022 Growth
Kyiv	ADR	1997	1936	2355	-3,1	21,6
	RevPar	1038	445	848	-57,1	90,4
	Occupancy %	52	23	36	-55,8	56,5
Odesa	ADR	2095	1362	2061	-35,0	51,3
	RevPar	964	341	536	-64,7	57,4
	Occupancy %	46	25	26	-45,7	4,0
Bukovel	ADR	1936	2354	3623	21,6	53,9
	RevPar	1162	1271	2101	9,4	65,3
	Occupancy %	60	54	58	-10,0	7,4
Lviv	ADR	2322	2540	2732	9,4	7,6
	RevPar	1138	1448	1421	27,2	-1,9
	Occupancy %	49	57	52	16,3	-8,8

Complex transformation processes have a significant impact not only on the revenue of Ukrainian hotels, but also on their profitability. The decline in profits during the introduction of quarantine restrictions during the Covid19 pandemic was followed by slow growth after the end of the pandemic. However, since February 2022, the downward trend in profitability has continued. The operating profit in hotels and accommodation facilities fell from 25.5% in 2019 to -28.5% in 2020, and then recovered to 16.6% in 2021 (Zagoruichyk, Savytskyi, Kopytsia & O'Callaghan, 2023).

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The most promising is the approach, the starting points of which are as follows:

- The new era of digitalization and digitalization requires a change in the strategies of management (Zubko, Hanechko, Trubei & Afanasyev, 2021). Thus, a hotel company should not be limited to setting profitability targets and monitoring their achievement. Instead, a comprehensive analysis of opportunities and active counteraction to crisis factors in setting prices, both on the basis of cost and in interaction with competitors in the direction of developing a common information and communication environment in the common economic space, should become a priority vector of this management system. After all, due to the specifics of the hotel services market (in particular, the significant dependence of demand on hard-to-predict natural, political and other factors), economic synergy can also be achieved through the development of partnerships between competitors (Boiko, Kulyk, Bondar, Romanchuk & Lositska, 2023).
- Hospitality enterprises in a globally competitive environment can be competitive if they use the latest organizational and management mechanisms that provide for targeted cooperation with enterprises of the national tourism industry, partners to obtain the expected marginal income from the provision of related services to expand the service range. Integration with partners in the development and implementation of a joint product implies a high level of coherence of missions, programs and actions of the system participants, their involvement, and therefore motivation. In addition, in the presence of chain hotels owned by multinational companies, it is important to take into account the transfer pricing policy and their impact on the national economy (Ivan & Ladar, 2017).
- An important reserve for revenue growth of a hotel company is the transformation and differentiation of distribution channels for hotel services (including segmentation). There are several approaches to differentiating distribution channels in the hotel business. One of them is to identify the target market and guest preferences and select appropriate distribution channels based on the target audience (Kulyk, Boiko, Bosovska & Okhrimenko, 2023). Another approach is to consider channel costs, commission rates, and potential long-term partnerships. It is also important to implement a channel management system to optimize operations and manage business processes. Regular monitoring and analysis of channel performance to optimize efficiency is crucial. In addition, optimizing distribution channels involves choosing the most relevant and profitable channels for the hotel's target audience. Hotels should evaluate the effectiveness of each channel based on factors such as booking volume, revenue generated, and guest acquisition costs. By identifying the channels that deliver the best results, hotels can effectively allocate resources and marketing efforts. This will help to increase the level of involvement of consumers, as well as all employees of the partner hotel company in the process of providing / selling / booking services, as well as the interest of each participant in the effectiveness and efficiency of this process.
- Hospitality enterprises, implementing the Revenue Management System in a high-risk and unstable external environment, should use social and ethical adaptation of strategy and tactics of market behavior to ensure sustainable development.

These practices will include:

- Environmental initiatives: Implementation of environmentally friendly technologies and practices, such as reducing energy, water and waste consumption, using renewable energy sources and green technologies.
- Social responsibility: Developing programs and initiatives to improve working conditions, support local communities and ensure social justice (Kulyk, Lipowski & Boiko, 2024).
- Ethical stewardship: Developing ethical standards and governance practices aimed at maintaining high standards of business ethics and responsible behavior.
- Cooperation with local communities: Development of programs and projects aimed at supporting local communities, developing local infrastructure and ensuring mutually beneficial relations with local partners.

These practices contribute to the sustainable development of the hotel industry and increase its responsible behavior towards society and the environment.

Hotels face several challenges in the social and ethical adaptation of their strategies. One of the main challenges is the costs associated with implementing such practices. Training employees, developing policies, and implementing sustainable practices takes time and money. Another problem is the lack of awareness and understanding of the importance of social and ethical responsibility among employees and hotel management.

In addition, hotels may face resistance from stakeholders who favor short-term profits over long-term sustainability. Finally, measuring the impact of socially and ethically responsible behavior on a hotel's financial performance can be difficult, which may prevent some hotels from investing in such practices. However, despite these challenges, hotels can benefit from doing business in an ethical and responsible manner, as it can lead to increased employee morale, guest loyalty and long-term profitability.

DISCUSSIONS/CONCLUSIONS

Solving the problems of adaptation of hotels to work under martial law reveals the content of the elements of the concept of crisis management in hospitality management developed by us, the essence of which is revealed by the following definition: Anti-crisis management in hospitality management is a discrete process of applying forms, methods and procedures aimed at socio-economic recovery of financial and economic activities, on the one hand, and maximizing revenues and using innovative opportunities to improve business processes, provided that hotel enterprises have access to complete information about the market situation and make subsequent decisions based on it, on the other. Hotels facing problems during the crisis should adapt their revenue management strategies by focusing on such approaches.

Thus, crisis management in hospitality management should be considered in at least three aspects. Firstly, as a concept that asserts the economic feasibility of using the tools of revenue management to optimize revenues in order to analyze and identify areas for diversification of activities during periods of low occupancy using market analytics tools. A customer relationship management (CRM) system and social media management tools play a

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fundamental role in creating the conditions for the implementation of this concept to interact with guests and promote offers tailored to diversified distribution channels.

Secondly, as a strategy aimed at using digital technologies and selecting tools, such as channel managers, rate management software and booking engine functions, to manage online distribution channels and optimize pricing strategies and attract customers and partners, as well as manage them and optimize their value in the long term based on the relevant corporate culture, including the development of philosophy, traditions, systems and quality standards for service provision. At the same time, the strategic goals of a hotel company include ensuring an optimal model of behavior in the market, which involves differentiating the range of services from competitors by selecting and developing unoccupied niches, and therefore minimizing conflicts and finding and expanding the number of points of partnership cooperation to better meet the needs of consumers. In today's digital world, it's becoming essential for any manager or entrepreneur to be well aware of the impact of digital marketing on consumer behavior (Kaur, 2023).

Thirdly, as a methodology for coordinating and combining methods of pricing and managing the profitability of individual services throughout their life cycle using a set of modules united by a single business logic and integrated into the corporate information environment, as well as for coordinating actions with partners and competitors.

The feasibility of introducing the concept of crisis management in the revenue management into the activities of hotel enterprises can be proved by considering the prerequisites (the state of development of the hotel services market and the peculiarities of demand determined by it, as well as possible sources of risk) according to the scheme used by us when considering the previous concepts. The presence of objective and subjective prerequisites for the implementation of the proposed concept in the Ukrainian hotel services market indicates its relevance

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ADAPTING TO CHANGE IN THE MODERN WORLD: SKILLS DEVELOPMENT IN HIGHER EDUCATION FOR ECONOMIC AND SUSTAINABILITY ISSUES

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Abstract: *The capacity to adapt to change is critical for both individual achievement and societal growth in the quickly changing global scene of today. This study investigates how higher education can provide students with the tools they need to successfully handle difficulties related to sustainability and the economy. Utilizing multidisciplinary viewpoints from the fields of education, economics and environmental studies, this research delves into the tactics and methods used by universities to cultivate flexibility and fortitude in their students. This research attempts to uncover critical competencies and pedagogical strategies that support skill development for solving complex economic and sustainability concerns by looking at case studies and best practices from different educational environments. This research also examines the relationship between environmental sustainability and economic growth, highlighting the value of holistic methods in the creation of curricula for higher education. In the end, this study adds to the continuing conversation about the role of higher education in equipping students to prosper in a changing, globally interconnected world where sustainability and adaptation are essential to long-term success and the welfare of society. Additionally, this article emphasizes the significance of acquiring 21st-century skills for success in the contemporary workforce, including as critical thinking, creativity, cooperation, communication, and technological literacy. In order to successfully solve economic and environmental concerns, the research ends with recommendations for enhancing programmes for skill development, funding faculty development, encouraging multidisciplinary collaboration, and interacting with stakeholders.*

Keywords: *Higher education, sustainability, economic growth, pedagogical strategies*

INTRODUCTION

Rapid technology breakthroughs, economic transformations, and environmental issues require higher education to take a proactive approach to skill development in light of the ever-changing modern world. Formerly focused only on academic information acquisition, the traditional model of higher education today has to provide students with the adaptable skill sets needed to deal with changing economic and sustainability issues. This introduction explores the vital role that higher education institutions play in helping students develop resilience and flexibility so they are ready to flourish in a world where change is a constant.

The economic landscape has changed dramatically as a result of globalisation, automation, and the creation of new industries. This has brought about both opportunities and challenges. Higher education establishments must therefore place a significant priority on developing abilities like critical thinking, problem-solving, entrepreneurship, and adaptability. In addition to making graduates more employable, these abilities enable them to spur economic growth, foster innovation, and negotiate the uncertainties of a labour market that is changing quickly.

Stronger ties between academia and business are clearly advantageous to both parties, unless it takes up time that a professor should be using to assist students. While working with businesses is “the third task” for universities in the Nordic region, many of these institutions do not charge tuition; yet government financing for these institutions ranges from 20% to 35% (Bridgestock, 2021). The government of Japan separated HEIs into multiple groups and gave the instructions on how to locate their own revenue streams (Destination Guides, 2021). In many nations, HEIs are becoming increasingly distinct from one another as a result of their uneven success in these endeavours. Furthermore, a number of knowledgeable observers assert that even with better didactics, the declining quality of instruction cannot be entirely offset.

Another difficulty facing HEIs is how to integrate the Sustainable Development Goals (SDGs) into their institutional, scientific, and pedagogical processes on a worldwide scale. The majority of the world’s top institutions compete in Times Higher Education THE’s Impact Ranking (Impact Rankings, 2021), which indicates how closely they adhere to the SDGs, which were endorsed by all UN members in 2015. A total of 767 institutions from 86 countries took part in the 2019 THE ranking; nevertheless, 82% of them are located in high-income nations.

These changes suggest that higher education is becoming increasingly cognizant of the consequences of contemporary, post-industrial society in academia. The 21st century demands a completely distinct knowledge base and skill set due to its intensity and complexity, which includes understanding the sociopsychological characteristics of young people who are preparing to enter the workforce. A university cannot meet the highest scientific standards on its own. Regardless of the precise responsibilities they will play in society or the economy, they are now expected to be able and motivated to instil in young people the ideals of sustainable development and a feeling of social responsibility. Regrettably, not many governments recognise the need for constant assistance and sufficient financing for this.

In conclusion, the necessity of developing new abilities in higher education is highlighted by the need to adjust to change in the current world. Institutions may empower students to flourish in a fast-changing global world by providing them with the varied skills necessary to address sustainability and economic challenges. This investigation will focus on different approaches and top techniques for incorporating skill development into curricula in higher education, with the ultimate goal of producing a new breed of knowledgeable, flexible and conscious leaders.

Higher Education and Sustainability

Higher education establishments play a pivotal role in propelling social and economic advancement by moulding the cognizance, competencies, and principles of forthcoming generations. The relationship between sustainability and higher education has gained more

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attention in recent years. More and more people are calling for higher education to take the lead in tackling urgent global concerns including social injustice, resource depletion, and climate change.

Academic institutions have a pivotal function in advancing sustainability via many approaches such as curriculum development, campus management, research endeavours, and community involvement.

- *Curriculum Integration:* A lot of colleges include sustainability concepts in all areas of their curricula. Regardless of their major, this integration guarantees that students are exposed to ideas like social responsibility, renewable energy, sustainable development, and environmental science. Higher education institutions teach students to become environmentally conscious professionals prepared to face sustainability concerns in their particular industries by offering courses, minors, or majors focused on sustainability.
- *Research and Innovation:* Universities carry out research to expand understanding and provide novel approaches to sustainability problems. Numerous academic fields are covered by this research, including engineering, economics, sociology, environmental science, and public policy. Universities frequently create sustainability-focused research centres or institutes to promote multidisciplinary collaboration and provide funding for significant studies that tackle urgent environmental issues.
- *Campus Sustainability Initiatives:* A lot of colleges integrate sustainability practices into their internal infrastructure and operations. Energy-efficient building designs, renewable energy installations, trash reduction and recycling programmes, water conservation techniques, environmentally friendly transportation alternatives, and sustainable procurement methods are a few examples of these activities. Higher education institutions show their dedication to environmental stewardship and give students real-world examples of sustainability in action by implementing sustainable practices on campus.
- *Outreach & Community Engagement:* In order to enhance sustainability and solve regional environmental issues, higher education institutions interact with the communities in which they operate. In order to design and carry out sustainability projects, initiatives, and outreach programmes, this involvement may entail collaborations with regional administrations, companies, nonprofits, and community organisations. Universities can help create more resilient and sustainable communities while giving students chances for hands-on learning and civic participation through community involvement.
- *Accountability for Sustainability:* To monitor and disseminate their progress towards environmental, social, and economic sustainability objectives, several colleges provide sustainability reports. Data on energy use, greenhouse gas emissions, waste production and diversion, water use, sustainable transportation choices, sustainable procurement methods, and social responsibility programmes are usually included in these reports. Higher education institutions show their stakeholders that they are accountable to them

and work to continuously improve their sustainability practices by being open and honest about their sustainability performance.

Higher education institutions, in general, are essential to the advancement of sustainability because they train the next generation of leaders, carry out research, adopt sustainable practices on campus, interact with the community, and encourage responsibility and openness in sustainability initiatives. By means of these diverse channels, academic institutions aid in moulding a future that is both egalitarian and environmentally friendly.

Higher Education and Twenty-First Century Skills

Companies' contributions to society need to shift fundamentally and permanently as a result of the post-COVID and climate change reality. In order to effectively address the need for action on a sustainable, human-centric, and resilient European industry, leaders must possess the abilities to consider, comprehend, and act in the company's and society's long-term best interests as well as to fit within the current but also the foreseeable EU policy frameworks (Cooke, 2012).

The skills and abilities required by the current labour market heavily dominate themes covered later in school, and the reasons for this include the rising pace and breadth of change. It is widely acknowledged that compared to many other countries, the Nordic countries have embraced this issue earlier and more easily.

Employers pay graduates based on jobs, which are essentially determined by the sort of formal degree, and students are driven to get formal degrees even if they do not always indicate a set of abilities and skills. This is the primary issue that most European nations face. While this serves a very different social purpose—that of training the future elite in a society where the majority of people lack literacy—it is related to the idea of a traditional university.

A large portion of the workforce in higher education still operates under the outdated belief that they can only truly succeed as long as they impart to their students the greatest knowledge possible in their field. They pay little attention to the competencies and skills that employers will need in the labour market of the future. The majority of European nations continue to face serious challenges as a result of these discrepancies between the labour market needs and the actual competences of graduates (not so much in Scandinavia, in the US, and numerous Asian countries). Far too many university instructors are not receiving the help and encouragement they need to modernise their teaching methods. This is seen as their duty, which aligns with another antiquated method of treating every topic rigorously independently and providing little room for interdisciplinary and intersubject viewpoints and actions. The majority of institutions' curriculum and programmes on certain subjects serve as excellent examples of this. The OECD (OECD Future of Education, 2021) has created a global skills strategy, refocusing its attention from traditional higher education tracks to lifelong learning and skills retained throughout the lifetime. This is due to the organization's recognition of the intricacy of skills policies as well as the possibility for peer learning.

Let us emphasise that the leadership of universities and their departments, as well as the relevant authorities, are involved in this issue. The first stage is to assess what the appropriate government agencies and their policies should be doing, as well as what colleges and academics themselves ought to be doing.

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Nothing in the extensive education literature refers to, say, the «20th-century skills» because of the greater changes that have occurred in the 21st century as opposed to previous centuries. What are the 21st-century abilities that are necessary in today's technologically and socially advanced world and that must be gained through both lifelong learning and formal education, including university education? After reading a plethora of relevant material, we may choose to use Stauffer's (Stauffer,2021) summary, which consists of the twelve abilities and competences listed below, divided into three categories:

Learning skills: Critical thinking, Creativity, Collaboration, Communication. *Literacy skills:* Information literacy, Media literacy, Technology literacy. *Life skills:* Flexibility, Leadership, Initiative, Productivity, Social skills.

None of these abilities are brand-new, with the exception of digital literacy, but they have never been deemed necessary elements of a high-quality education. In the field of education science, they are now acknowledged as being very necessary for persons who wish to succeed in the modern workforce.

How will instructors help their pupils gain all these skills? is another important topic. To begin with, it is important to note that the professor or instructor was formerly highly esteemed based only on their position and academic standing. This is no longer the case; instead, students now need to sense the quality of their teachers and their desire to be welcomed due to their capacity to interact with them both in person and virtually.

The instructor must demonstrate a commensurate degree of proficiency in using digital tools to communicate with students online and search and share knowledge online in order to gain the respect and acceptance of the students. In the new technology era, students will consider their professors as senior partners, therefore only on this basis can a proper relationship be anticipated to grow. Without it, pupils will view teachers as learned individuals from a bygone era. This can lead to a big hole that would make it difficult to develop modern teaching methods or experiences.

Here are some beneficial proposals by a digital native, Professor T. Palmer, listing the significant characteristics of a high-quality 21st-century educator (Palmer,2021): Learner-centered classroom and personalized instruction, Students as producers, Learning new technologies, Going global, Smartly use of smartphones, Blog, Go digital, Collaborate, Use Twitter chats, Connect, Project-based learning, Build your positive digital footprint, Code, Innovate, Keep learning.

Creating and managing future scenarios and corporate foresight are generally not included in HEIs' curriculum or set as required courses for professional development pertaining to sustainable practices in organisations. Concurrently, corporate foresight has started to shift in recent years from being a tool for top management to a more inclusive stakeholder-driven approach. great levels of involvement, interaction, and immersion in hybrid techniques have demonstrated a great potential for increasing the number of stakeholders on board and advancing ownership of the deliverables.

The Economic and Social Roles of Higher Education

Competencies and skills are also essential in the continuous transition to a more sustainable economy. They are also necessary to foresee and address unforeseen outcomes of innovation. In order to create mid-range visions that serve as guidelines for cooperation, sustainability foresight competences necessitate the combination of empirical research skills with hermeneutic skills for the interpretation, contextualization, and evaluation of individual results. Rarely are these competences and skills taught in European HEIs (with a few notable exceptions in Finland, Germany, and France, for instance), (Adams, 2016).

Strategic sustainability foresight is a competence that is lacking in many European companies. Strategic foresight is a prerequisite for organisational integration, general strategic decision-making, and leadership and product/service level visioning. Businesses and students alike struggle to understand how to approach the task of working methodically with desirable and realistic green future possibilities (Adams, 2016).

Employers must implement significant and long-lasting reforms in response to the post-COVID and climate change reality. Here, skills and competences are essential to the continuous transition to a digital economy that is more robust, sustainable, and sustainable. They are also necessary to foresee and address unexpected repercussions of innovation (which is crucial for innovation focused on sustainability).

The current state of education in the majority of European nations falls short in the following areas:

- * Methods to promote sustainability foresight independent of the specific area of interest; a step-by-step hybrid learning approach; and product/service design schools.
- * Content and materials available for higher education establishments.
- * Appropriate individuals to impart the knowledge.

The use of cutting-edge approaches in digital, hybrid, and human-centered education to facilitate involvement led by stakeholders or students (Adams, 2016).

It won't be enough to address social issues, neighbourhood projects, and measures aimed at lessening environmental damage and social unrest. In order to achieve shared value, developing innovative goods, services, and business strategies is insufficient (Adams, 2016) to have the net beneficial effect that business may have. Rather, this calls for creating a values-based organisational culture and managing innovation through procedures and approaches that blend action, foresight, and direction. Let me emphasize that a value-based strategy is essential to achieving sustainable development goals since shared values guarantee dedication and perseverance in achieving desired results.

In keeping with the above justifications, HEIs may help create the ideal future by carrying out the following actions:

- Establishing a group of exceptional professionals with crowdsourcing and sustainability vision to identify obstacles and best practices.
- Compile and evaluate complementary information, abilities, and techniques; identify important obstacles in the areas of innovation, sustainability, and local and national industry.
- Involve experts and practitioners in jointly developing specialised solutions to deal with the aforementioned problems.

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- Create prototype solutions, which have to be tested and improved upon iteratively in collaboration with representatives of the industry partners who offer criticism and recommendations. Within the existing EU frameworks, such as Horizon Europe, Inter Reg, and other financing schemes, there are plenty of opportunity to develop new industrial solutions.

These arguments support the claim that, in order to ensure sustainable development and produce innovative skill sets, higher education needs to change to a multidisciplinary partnership with employers (industry) and policy communities at all levels. This shift is necessary in light of current economic and social trends. This claim may be used to inform recommendations for future studies on the trends and difficulties in higher education if the data from the current research are consistent with it. We conducted many bibliometric evaluations of the corpus of existing information to examine if the research patterns over the previous five years reflect our hypothesised path of higher education development in order to support such a notion and provide guidance for future empirical research. The analysis's foundation is:

- assessment of research trends, made possible by Elsevier SciVal, a scientometric tool that allows for the evaluation and benchmarking of research trends and performance based on Elsevier Scopus data;
- a thorough examination of bibliometric data pertaining to publications indexed by the Elsevier Scopus and Clarivate Web of Science (WoS), identified using the terms suggested, that describe the research trends in the body of existing literature about 21st-century skills, sustainability, and higher education.

METHODOLOGY

A high-level evaluation of research articles that may be related to 21st-century skills and the sustainability of higher education forms the foundation of empirical analysis. In this empirical investigation, we analysed an entire corpus of publications indexed by Elsevier Scopus that were related to the pertinent Sustainable Development Goals (SDGs) using the Elsevier SciVal scientometric tool. The prior five-year period, from 2016 to 2020, was the subject of the research.

We initially determined pertinent search phrases and keywords pertaining to sustainability, higher education, and 21st-century skills before conducting our research. Various concepts like "sustainability education," "21st-century skills," and "higher education" were among these keywords. Next, we searched the Elsevier Scopus database for publications published between 2016 and 2020 using these keywords.

Only peer-reviewed publications that directly related to the goals of the study were included in the search results. This required evaluating each article's title, abstract, and keywords to ascertain how relevant they were to the subjects of interest. The analysis did not include any articles that did not fit the criteria.

We performed a scientometric analysis of the corpus using the Elsevier SciVal tool after identifying the initial set of articles. This included analysing a range of measures and indicators to obtain insights into the state of research on sustainability and 21st-century skills in higher

education, including authorship patterns, publishing trends, and keyword co-occurrence networks.

Finding important topics, patterns, and trends within the corpus of articles was the main goal of the study. This involved figuring out which articles were the most often referenced, whose authors were the most productive, what the most popular study topics were, and whether there were any new areas of interest or disagreement in the field.

All things considered, the technique used a methodical strategy to locate and examine a large collection of research articles associated with the goals of the study. Through the use of the Elsevier SciVal tool, we were able to get important information on the current status of research concerning sustainability and 21st-century skills in higher education throughout the designated period.

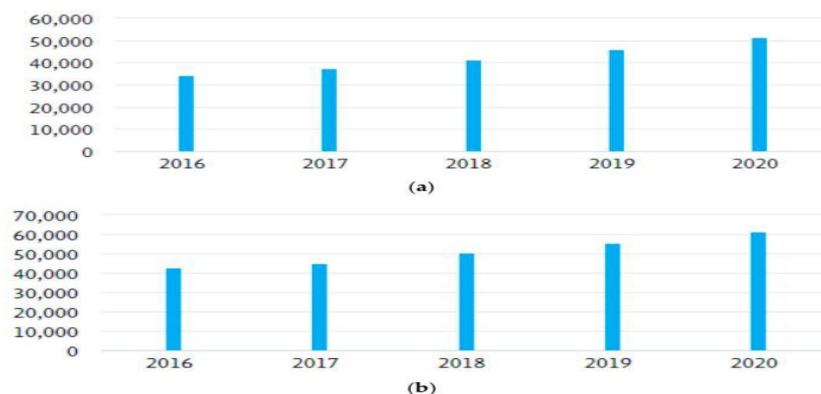
RESULTS AND DISCUSSION

Our empirical strategy is doing a high-level examination of academic papers from the five years prior (i.e., the 2016–2020 timeframe), which have been identified as pertinent to our study proposal and linked to the pertinent SDGs. SDG 4 (Quality Education), SDG 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action) are the broad topics of sustainability and the value of higher education for employers that we have mapped to.

Figures 1a–f, which also include the total number of published research items cited by Elsevier Scopus, demonstrate a rise in research interest in the chosen SDGs from 2016 to 2020. The fields of sustainable energy (Figure 1c), clean water (Figure 1b), climate change (Figure 1f), quality education (Figure 1a), sustainable consumption and production (Figure 1e), and sustainable cities and communities (Figure 1d) have the highest level of research interest among the pertinent SDGs.

Figure 1 (a)

Research output pertaining to SDG4 (210,989 total papers) from 2016 to 2020.



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Figure 2 (b)

Research output pertaining to SDG4 (210,989 total papers) from 2016 to 2020



- (a). *Research output pertaining to SDG4 (210,989 total papers) from 2016 to 2020.*
 - (b). *Research output connected to SDG 6 from 2016 to 2020 (a total of 264,807 papers).*
 - (c). *Research output pertaining to SDG7 from 2016 to 2020 (731,457 total papers).*
 - (d). *Research output pertaining to SDG11 from 2016 to 2020 (336,506 total papers).*
 - (e). *Research output pertaining to SDG 12 from 2016 to 2020 (198,075 total papers).*
 - (f). *Research output pertaining to SDG13 from 2016 to 2020 (221,759 total papers).*
- Source: Elsevier SciVal.*

Multidisciplinarity is the most noteworthy aspect of the results, as it aligns with the frequently discussed role of higher education in tackling the "wicked problems of the 21st century," such as sustainable development, innovation, and human capital production for the modern economy and society (Hensley,2021, Keep, 2014). To address these issues facing contemporary society, a multidisciplinary approach to research and transboundary education is necessary (Ramley,2014). This is particularly helpful in times of crisis, like the one the EU has experienced over the past five years, with the large influx of migrants [41], the economic difficulties brought on by COVID-19 (Zigman,2021), and other pertinent concerns. Table 2 provides an illustration of the multidisciplinary of the examined study fields.

Table 2*Lists the top 25 WoS fields of study that are related to the study subject.*

WoS Discipline/Category	WoS Record Count	% of 13.131 Records
Environmental Sciences	3042	23.167
Environmental Studies	1674	12.748
Education Educational Research	1632	12.429
Energy Fuels	996	7.585
Chemistry Multidisciplinary	906	6.900
Engineering Chemical	882	6.717
Engineering Environmental	838	6.382
Materials Science Multidisciplinary	724	5.514
Chemistry Physical	511	3.892
Plant Sciences	388	2.955
Multidisciplinary Sciences	362	2.757
Management	324	2.467
Biotechnology Applied Microbiology	300	2.285
Water Resources	291	2.216
Nanoscience Nanotechnology	251	1.912
Ecology	244	1.858
Agronomy	234	1.782
Forestry	234	1.782
Engineering Civil	233	1.774
Business	231	1.759
Physics Applied	231	1.759
Engineering Multidisciplinary	227	1.729
Construction Building Technology	212	1.615
Economics	201	1.531

Source: Clarivate Web of Science.

CONCLUSIONS

Ensuring sustainability remains a significant task of higher education and its institutions, which can be concluded based on the previously reported empirical results related to the extant literature, referred by WoS and Scopus indexing databases. However, a vast body of knowledge related to sustainability, its implementation, and the role of the higher education sector in ensuring sustainable development has put the empirical analysis of the 21st-century skills to be supplied by higher education institutions to the background. Nevertheless, this topic still deserves the full attention of scholars and policymakers alike.

As reported by the World Economic Forum, for the next four years, growth of 13.5% in emerging professions is expected—parallel to the decreasing fall of redundant jobs. Workers will have to acquire even 40%–50% of new skills during the next five years. Employers expect to offer reskilling and upskilling to 70% of their employees. This is creating an unprecedented challenge for everyone, including university teachers, who can contribute a lot but are often not sufficiently aware of the situation's urgency. The same can be said for the respective government departments, which is also applicable to students and the general public.

Moreover, various university rankings do not provide an objective insight into whether a country has developed an optimal university system. Excellence is certainly most welcome

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and adds to the international prestige of the countries concerned. However, improving the general level of university teaching (i.e., its relevance and quality) is even more critical. This is reflected by the education policy of Nordic and some Baltic governments, not only on the higher education level which could further serve as a benchmark and inspiration to other European regions.

This is why the awareness among policy and the educational communities, the professional and general public, and the media of the critical importance of 21st-century skills to be developed during the entire education cycle, including higher education. This notion is confirmed by the bibliometric analysis, which we performed, to support the theoretical identification of the relevant trends in higher education. It confirms that the extant body of knowledge views the integration of the relevant business skills for the 21st century with the outlook and competencies of ensuring sustainable (industrial) development as a key to the further development of European society and the economy.

Some specific recommendations, which could be extended, both to the higher education administrators as well as to the education policy community, include:

- Promoting multidisciplinary education and research through finance and human resource management strategies rather than merely declaring a multidisciplinary approach.
- Putting a focus on stakeholder communication and promoting collaborative research across academic, business, and policy players.
- Interacting with students and getting their feedback on suggested changes and policies for higher education.

This also requires adequate and stable funding of higher education institutions, wherever it may come from. While 100% public funding might not be realistic in all European countries, governments and universities should cooperate in creating a system that secures the conditions for quality in teaching and research. Many countries have not yet found a reasonable university funding scheme to develop, encourage, and provide the best possible learning outcomes for the highest possible percentage of students to complete their studies and stimulate individual universities to achieve these goals without compromising the strict quality criteria.

Our proposition and recommendations to researchers, policymakers, and higher education administrations might help achieve such a goal.

In summary, this study has advanced our knowledge of how higher education may adjust to the changing needs of the contemporary world by giving priority to the development of skills related to sustainability and economic challenges. Higher education institutions may realize their role of equipping students to flourish in a dynamic and interconnected global world by embracing this necessity and cooperating towards common goals.

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ENTERPRISE ECOSYSTEM AND SUSTAINABLE DEVELOPMENT: IMMANENT INTERDEPENDENCE

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Abstract: *Global hypercompetition necessitates the development of new models of business collaboration among economic entities. Enterprise ecosystem is one form of organization and support for entrepreneurship that facilitates the transition from competition to cooperation among business entities. The article explores various theoretical approaches to defining the concept of ecosystem that enabled to propose the author's interpretation. It is substantiated that the entrepreneurial ecosystem offers optimal pathways and effective tools for fostering innovation and economic growth, grounded in the principles of sustainable development. A comparative analysis of organizational models of activity is conducted. Compared to other organisational models, the ecosystem entails the transformation of hierarchical management mechanisms, giving rise to a dynamic environment facilitating the free exchange of knowledge, information, resources, technologies, and competencies. The synergistic model of the enterprise ecosystem within the framework of sustainable development is proposed. The model exhibits several characteristic features: cross-industry interaction, which maximizes synergies more effectively than corporate ties; diversification of activities with a focus on lean innovation; emphasis on environmental sustainability and the commercialization of developments; flexibility of business processes; autonomy of participants and adherence to voluntary cooperation principles. The article substantiates the key improvement strategies that enterprises should implement to achieve synergistic effects and sustainable development goals within the enterprise ecosystem.*

Keywords: *ecosystem, sustainable development, partnership, ecosystem life cycle, synergistic effect.*

INTRODUCTION

The transformation of national economies in the context of the growing Fifth Industrial Revolution is accompanied by multi-vector, large-scale changes across all sectors. At its core, this involves structuring the global economy, advancing sustainable development initiatives, fostering circular business models, and establishing ecosystems that are inherently shaped by innovative changes in global economic processes. In the context of intensifying international competition, business entities that effectively develop and implement innovative projects, leveraging their resource capabilities productively and maximizing their scientific and technological potential, will gain a competitive advantage.

To realize these advantages, it is imperative to establish an appropriate information and technology framework and develop a new management model – an ecosystem – designed to facilitate the digital transformation of enterprises, foster innovation, promote the intellectual

and professional growth of employees, and modernize business processes in accordance with evolving market conditions. This highlights the imperative to tackle challenges associated with the exploration of organizational and management models – ecosystems that provide optimal methods and efficient tools to promote innovation and economic growth, all anchored in the principles of sustainable development.

The challenges posed by the accelerated process of globalization and transnationalization, coupled with the unpredictable nature of the global economy amidst prolonged crises, necessitate that business entities realign their economic, technological, innovative, and environmental development strategies. The growing role of the ecosystem is a polymorphic phenomenon today and an important element of management in a turbulent business environment.

The issues of environmental protection and the rational use of natural resources, crucial for societal well-being, industrial development, and public health, are intricately intertwined with the modern concept of VUCA – Volatile, Uncertain, Complex, and Ambiguous. VUCA represents a turbulent and volatile business environment where stability cannot be guaranteed. Simultaneously, the significance of the enterprise ecosystem is on the rise, necessitating the consideration of changes in both internal and external environments, and the assurance of control amidst escalating complexity and inherent instability. At the present stage, long-term economic development is only achievable through the establishment of a new ecosystem for resource utilization, aimed at fostering the growth of various economic activities. Moreover, the theoretical underpinning of the enterprise ecosystem constitutes an integral aspect of the concept of sustainable development.

The evolution of the ecosystem concept

The dynamic shifts in competitive forces towards innovation, the rapid adoption of new technologies, and a receptiveness to change have transformed the primary objective of prevailing enterprise strategies. Now, it's not only about attaining competitive leadership but also about fostering effective cooperation to ensure sustainable development of each partner and society as a whole. Ecosystem is one of the organizational forms for entrepreneurship that facilitates the coordination of interactions between business entities, guiding them from dynamic competition towards productive partnerships.

The concept of ecosystem represents a post-neoclassical approach in economic science, as evidenced by its distinct features: the advancement of synergetics concepts, the widespread adoption of co-evolution principles, and the utilization of interdisciplinary integrated approaches within the realm of entrepreneurship.

Understanding the fundamentals of utilizing ecosystems in economic theory requires an examination of the historical origin of the prefix “eco”. The earliest recorded use of the prefix “eco” dates back to the writings of Hesiod in the 8th to 7th centuries BC (Alvedalen & Boschma, 2017). Hesiod described an autonomous household, the “oikos” (οἶκος), which is the basic economic unit of a state and encompasses various activities, products and citizens. The terms “ecology” and “economy” are derived from the concept of “oikos”.

There are different scientific views on the formation of the concept of ecosystem and its relationship with the economy. Rothschild (1991) in his work “Bionomics: Economy As Ecosystem” considers the economy to be an analogue of a biological ecosystem. The author

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emphasised the nature of cooperation between economic agents, their innovativeness and relations with the external environment.

According to Muegge and Mezen (2017), the greatest influence on the emergence and development of the concept of ecosystems in the economy was made by such areas of economic theory as organisational ecology, neo-institutional theory, and the concept of dynamic capabilities of the enterprise. Additionally, these theories are part of the strategic management concept, which considers ecosystem as a competitive advantage of the enterprise in value creation.

Examining ecosystem through the lens of entrepreneurship allows us to trace its evolutionary development, which can be attributed to theories such as the cluster theory of economic development (Bergman & Feser, 1999), the concept of regional innovation systems (Cooke, 1996), and the theory of entrepreneurial networks (Hite & Hesterly, 2001).

The pioneer of the concept of ecosystems in the realm of entrepreneurship is the British economist Valdes (1988), who first introduced this concept to the scientific community in 1988. In his article “Entrepreneurial Ecosystem: Towards a Theory of New Business Formation”, he asserts that ecosystem structure in the process of new business formation contains two dynamic elements: the entrepreneur and the entrepreneurial environment.

In the book “The Emergence of a New Corporate Form”, Moore (1998) emphasizes that “Entrepreneurial ecosystems, much like successful species in nature, emerge from essential resources. Ecosystems condense from capital, customer interests, and the talent generated by innovation, mirroring how successful species thrive from sunlight, water, and nutrients in the soil” (Moore, 1998, p. 170).

Noteworthy is the opinion of Spilling (1996), who, in his works on regional entrepreneurship, states that entrepreneurial ecosystem consists of various actors, roles, and environmental factors that interact with each other.

A similar perspective is shared by Cohen (2006), who observes that “Entrepreneurial ecosystems are a diverse set of interdependent actors within a geographical region that influence the formation and trajectory of the entire group of actors and, possibly, the economy as a whole” (Cohen, 2006, p. 4).

Isenberg’s (2010) interpretation of the ecosystem holds practical significance. The scientist believes that entrepreneurial ecosystem consists of a set of individual elements, such as leadership, culture, capital markets, and customers, which are interconnected.

Mason and Brown (2015) define the concept of ecosystem through the lens of partnership. The authors argue that “Ecosystem is a set of interrelated business entities, organizations, institutions, and processes, formally and informally united for interconnection” (Mason & Brown, 2015, p. 53).

A similar opinion is shared by Adner (2017), who defines ecosystem as follows: “A set of networks of suppliers, distributors, outsourcing companies, producers of related goods or services, technologies, providers, and other organizations that influence and are influenced by a company by creating and delivering their own offerings” (Adner, 2015, p. 48).

The innovative aspect of ecosystems is emphasized by Autio and Thomas (2014). The scientists note that “ecosystem is a network of interdependent organizations linked to a central

firm or platform, including a producer and external partners, which together create new value through innovations” (Autio & Thomas, 2014, p. 90).

The technological orientation in defining ecosystems is evident in the scholarly work of Adomavicius, Boxstedt, and Kaufman (2007). These scientists argue that ecosystem comprises a collection of interdependent technologies and technological advancements that influence evolutionary processes.

Thus, an analysis of publications dedicated to ecosystem research reveals that scientists possess a deep understanding of existing challenges. Furthermore, it demonstrates the gradual formation of theoretical, methodological, and methodical approaches aimed at addressing these issues. From the generalization of views on the essence of ecosystem, five scientific areas of ecosystem interpretation through the prism of sustainable development emerge. These include the rational use of resources, environmental protection, economic growth, improvement of social protection, and consideration of the interests of present and future generations.

The essence and the main stages of ecosystem development

The ecosystem concept enables to reevaluate agglomeration interaction across several dimensions: regional (national, sectoral, municipal ecosystems), sectoral (industrial, media, financial, etc.), and functional (entrepreneurial, innovative, digital). The goal of ecosystem is to achieve coordinated development among its stakeholders by integrating requirements, rights, and responsibilities. Consequently, coevolution becomes a dynamic component of the business ecosystem, representing the overarching goal of its evolution. Coevolution entails the attainment of new system properties, the realization of social and economic effects, and both quantitative and qualitative changes in the processes of cooperation and competition.

It is worth noting that, unlike clusters and network groups, the initiation of ecosystem association does not solely belong to one participant. Cooperation within the ecosystem is driven by self-organization, where each member benefits from the others. Self-organization underpins the principles of cooperation and partnership, serving as the foundation for relations among ecosystem participants and distinguishing ecosystem from other organizational models. A comparative analysis of organisational models is presented in Table 1.

Table 1
Comparative characteristics of organisational models

Comparison criteria		Cluster	Network organisation	Ecosystem
1.	The purpose of the formation	Increasing the competitiveness of an industry or region	The utilization of features, resources, and specific advantages for the collaborative implementation of entrepreneurial projects.	Initiating and implementing business innovations or a unique product
2.	Boundaries of the association	Geographic or sectoral	The value chain of a particular product or service	Cross-sectoral, cross-territorial

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3.	Criteria for mergers	By stages of the production process	Along the chain of creation and sale of products or services	By stages of the life cycle of a new product or new technology
4.	Relationships between participants	Internal competition	Consolidation of goals	Cooperation and partnerships
5.	Opportunity to become a member	Restrictions and requirements for participants	Specific rules for entering the system	High degree of openness
6.	Management	Existence of governing bodies at the state or regional level	The management body belongs to the initiator of the network association	Self-organisation

Source: Wurth et al., 2021

Based on the information in Table 1, it can be argued that the differences between these models are not fundamental, but reflect the goals and challenges of certain stages of economic development. It is worth noting that, unlike other organisational and economic models of development, ecosystems have three important advantages: they provide access to multi-vector opportunities for innovative growth, facilitate rapid scaling, and are flexible and models.

So, it can be concluded that in our opinion, ecosystem is an integrated adaptive system that includes a complementary set of active subjects, types of activities, cooperative relations, internal and external environment factors (social, economic, infrastructural, and institutional) that provide for the efficient use of human, material, and intellectual resources for the purpose of sustainable development.

The scope of the study

In line with the theoretical framework previously outlined, which emphasizes the conceptual foundation of ecosystems, the subsequent sections of the article will present fundamental findings, concentrating on the following objectives:

- to justify the growing interest and relevance of research in the field of entrepreneurial ecosystems;
- to outline the relationship between the enterprise ecosystem and the innovation ecosystem;
- to determine the main stages of ecosystem development
- to substantiate key development vectors that enterprises need to implement in order to ensure the leadership position of the entrepreneurial ecosystem;
- to develop the synergistic model of enterprise ecosystem within the framework of sustainable development.

The proposed synergistic model includes fostering collaboration, innovation, and mutual benefit among ecosystem participants, as well as implementing sustainable practices

and policies that promote the triple bottom line of economic prosperity, environmental stewardship, and social equity.

METHODOLOGY

This article is based on secondary sources of data, which were obtained from published books, journals, and research papers. The study adopts a qualitative research approach.

RESULTS

The increasing interest and relevance of research in the field of creating and ensuring effective enterprise ecosystems can be attributed to objective reasons. Firstly, through the remarkable results achieved by ecosystems. For instance, 7 out of the 10 largest companies in the world employ the concept of ecosystems. According to the BCG Henderson Institute's 2022 analysis, companies operating on the principles of the ecosystem include Alphabet, Amazon, Apple, Facebook, Microsoft, Alibaba, and Tencent (Jafarov & Szakos, 2022).

The second reason for the creation and development of entrepreneurial ecosystems is the transformation of traditionally structured industry markets. According to research conducted by "Accenture" analysts, it's noteworthy that ecosystems serve as a catalyst for reshaping various industries, leading to "tectonic shifts" among them. Seventy-six percent of surveyed business leaders agree that over the next 5 years, business models will undergo re-engineering due to the impact of ecosystems (Velt et al., 2020).

Thirdly, the enterprise ecosystem model also appeals to companies that are not necessarily aiming for leadership positions in global rankings. Their goal is to achieve and sustain a high level of competitiveness. In the face of turbulent changes, many companies struggle to operate independently. They require collaboration with partners, involving the sharing of unique technologies, databases, customer information, key competencies, and mechanisms for commercializing innovations. The formation of enterprise ecosystem enables increased flexibility and reduces the time required for making relevant management decisions, obtaining necessary infrastructure support, distributing risks, and converting the knowledge and skills of human resources into new technologies.

Entrepreneurial ecosystem is an adaptive form of partnership among actors from various sectors of the economy. It integrates the outcomes of interdisciplinary research and development to collaboratively address complex problems, primarily of a practical nature.

A key condition for the formation and successful implementation of entrepreneurial ecosystem projects is the presence of a project initiator who is deeply committed to its success, along with a favourable environment that offers free market access, financial and other forms of support, as well as knowledge and information. Thanks to the systemic functions of entrepreneurial ecosystem, the potential for development among actors increases, leading to the emergence of new forms of multi-vector cooperation within the context of economic transnationalization. On the other hand, the likelihood of entrepreneurial ecosystem's survival also increases as its participants' social, economic and environmental efficiency grows.

The term "enterprise ecosystem" is most closely related to the term "innovation ecosystem". The conceptual foundations of enterprise ecosystems are presented in studies of regional innovation systems, which emphasize the interconnection of formal and informal institutions and innovative developments.

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A number of researchers, such as Echterhoff, and Amshoff (2013), Poetz, and Prügl (2019), have studied the impact of inter-sectoral interaction within industries on the results of innovation activities. As noted by authors N. Echterhoff and B. Amshoff (2013), there is a need to explore new ways of leveraging production potential to innovate. Creating dynamic entrepreneurial ecosystems based on innovation is one way to address this problem.

At various times, researchers have emphasized the necessity of eliminating inter-sectoral barriers to stimulate the innovation process (Spigel, 2020). This involves combining unique knowledge and resources from different industries, as well as facilitating free technology transfer. This thesis is corroborated by Farhadi's (2019) published book, "Cross-Industry Ecosystems", in which the author elaborates on the theoretical and methodological foundations of the new concept. Farhadi (2019) emphasizes the complexity and necessity of inter-sectoral economic growth.

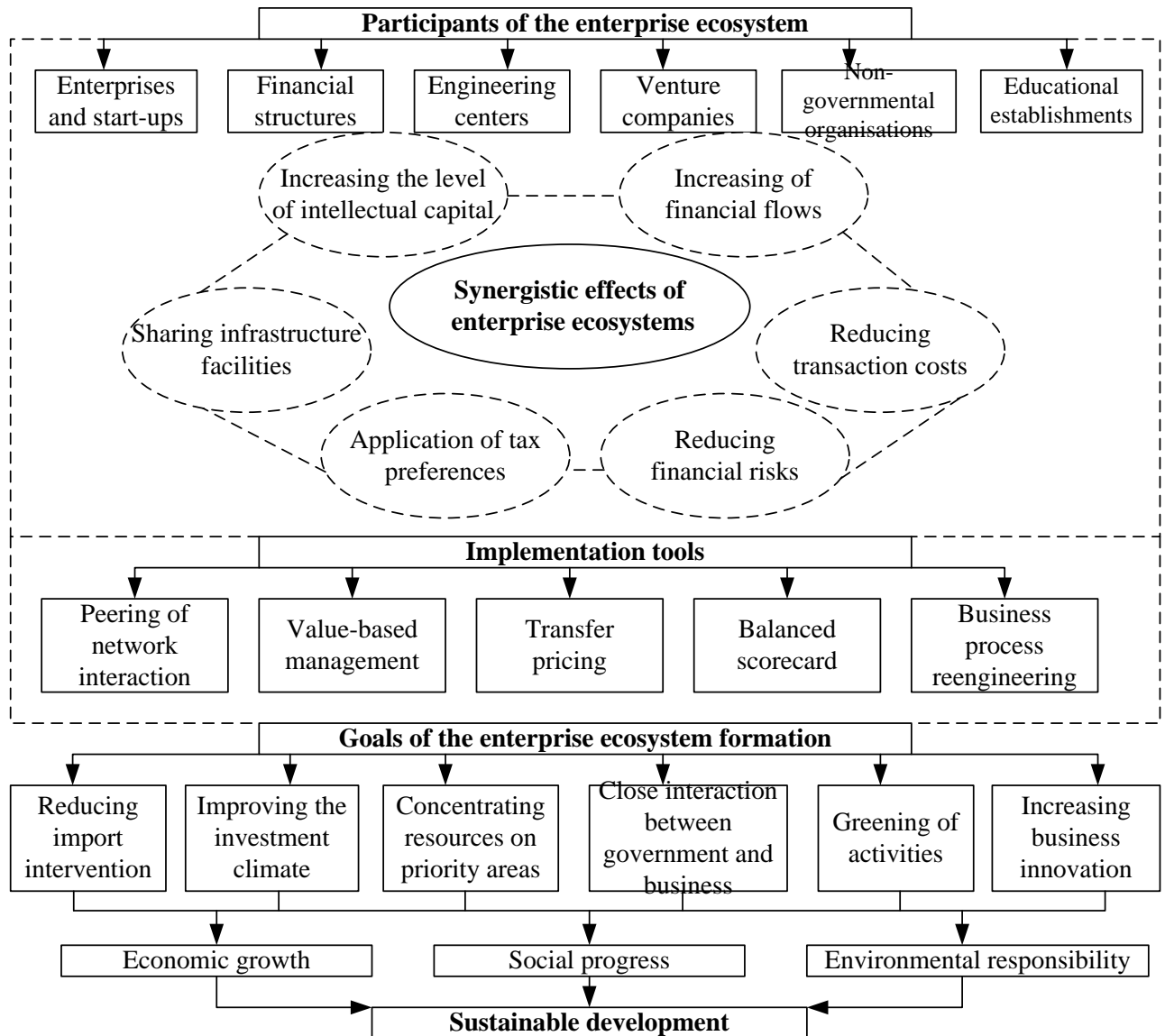
Synthesizing the essence of the enterprise ecosystem, it can be defined as a localized spatial complex comprising hierarchical structures, business processes, and infrastructure facilities that interact to create the necessary conditions and a conducive environment for generating new resource combinations and facilitating knowledge transfer to commercialize innovations. Today, the formation and development of entrepreneurial ecosystems are prioritized, driven by the necessity to consider the interdisciplinary nature of modern innovations, the practical value of multidisciplinary competences, and the importance of inter-sectoral collaboration.

It is worth noting that entrepreneurial ecosystems do not have territorial boundaries - cooperation is carried out by participants from different territories and industries. Enterprise ecosystems do not have a defined timeframe - the interaction of specific participants is carried out in accordance with the requirements of innovative engineering projects. The consolidating factors of the enterprise ecosystem are key competencies, unique knowledge, the latest technologies and relevant information. The environment formed based on the principles of the ecosystem model enables each participant to effectively achieve their digitization goals, initiating, developing, and implementing innovative technologies and business processes, thereby achieving a powerful synergistic effect.

The trend of ecosystem integration contributes to the formation of an environment for the active development of centers of social and economic growth and ecological balance, fostering synergies through cooperation between enterprises and organizations in the value creation process.

The theoretical and practical aspects of forming enterprise ecosystem within the framework of sustainable development are summarized in the developed synergistic model (Figure 1).

Figure 1
The synergistic model of the enterprise ecosystem within the framework of sustainable development



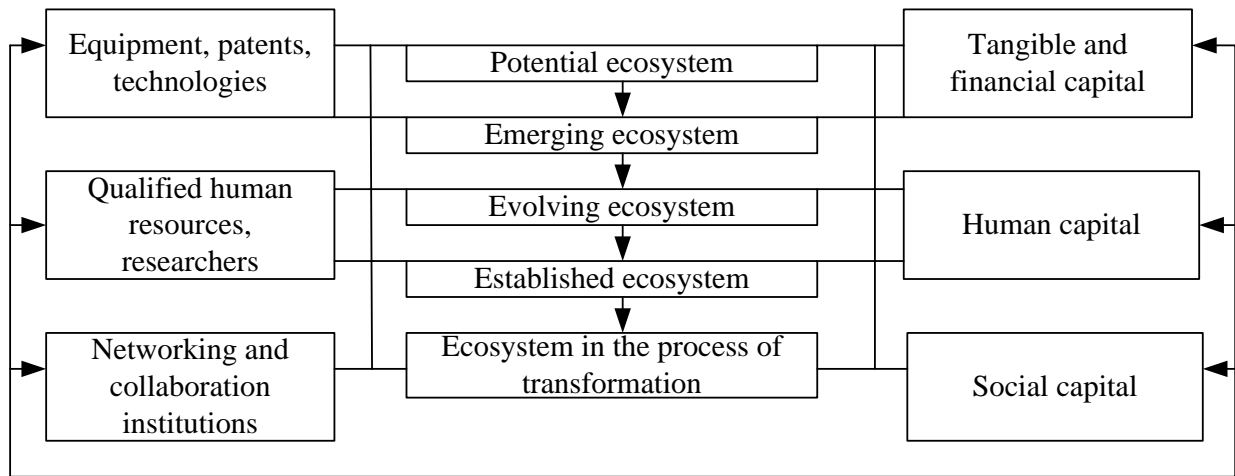
Source: created by the author

The presented model illustrates the transition from rigid management to flexible network structures, highlighting opportunities for integrating sustainable practices into business processes, diversifying activities, and outlining strategies for the balanced utilization of resources and productive collaboration among ecosystem participants. These efforts aim to leverage the competitive advantages of participants and achieve synergistic outcomes within the framework of sustainable development.

Each ecosystem goes through certain stages in its development, which differ depending on the participants, the specifics of cooperation and intra-network connections. However, we can identify a general model of ecosystem development consisting of the following stages (Figure 2).

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Figure 2
The main stages of ecosystem development



Source: created by the author

It is advisable to consider the main stages of the ecosystem life cycle in more detail.

The first stage, a potential ecosystem, begins as a local concentration of enterprises in related and interdependent industries. There are agglomeration effects, but no integration mechanisms. The concentration of enterprises in one area causes competition and, at the same time, stimulates the development of technologically related enterprises. At the same time, if there are technological and organizational linkages between integrated industries that can become sources of productivity and competitiveness, enterprises are looking for ways to implement and commercialize them. This moment can be the impetus for the development of the ecosystem.

The second stage is an emerging ecosystem. Competition between producers in the basic industry is reaching a noticeable level, and its pressure is forcing them to look for new forms and strategies of competition. The search is driven by innovations in the end-user value chain. Dynamic competition within the system results in increased specialization in line with the needs of the underlying industry, improved quality of raw materials, improved equipment and specialized services, and the development of employee competence. An important result is the beginning of close personal contacts between entrepreneurs participating in the ecosystem.

The third stage is an evolving ecosystem. It is characterised by a high level of competition between manufacturers of the final product, developed markets for raw materials, equipment and skilled workers. New formal and informal cooperation institutions, non-governmental organizations, and websites related to participating companies and the industry are emerging. The third stage may be driven by the emergence of new ecosystem participants, as the complex of interconnected ecosystem enterprises is assessed as attractive for investment. An innovation and source of development may be the involvement of enterprises from new industries that are part of a vertical integration chain or have horizontal links.

The fourth stage is an established ecosystem. At this stage, the collaborative effects should be pronounced. The ecosystem is highly competitive, innovative and environmentally friendly. A high degree of vertical and horizontal integration has been achieved; markets for end products, raw materials, equipment, and human resources are highly developed; and

effective information exchange mechanisms are in place. Stimulating factors of development are a high level of competition and cooperation within the ecosystem, maximization of economic, social, cultural, qualification ties and protection of environmental interests.

The fifth stage is a transforming ecosystem. It is characterized by a change in the form and properties of the ecosystem in response to environmental challenges. In order to function successfully in the new environment, the ecosystem should develop and perform new technical, product, information and management solutions, improve environmental standards, and implement improved social and economic principles of ecosystem functioning.

It should be added that the dominant idea initiating the formation of an ecosystem can often be the production and implementation of an innovative project, the creation of a new product or technology, the development of digital platforms, etc. At the same time, one company can participate in several ecosystems simultaneously, implementing various projects, being, for example, a customer, a supplier of unique resources or a contractor of various projects

Based on a preliminary analysis of the theoretical aspects of ecosystem theory, we propose key development vectors that enterprises need to implement in order to achieve sustainable development goals, synergistic effects, intensify innovative growth, and ensure the leadership position of entrepreneurial ecosystem in economic, social, and environmental aspects:

- creation of a unified enterprise information environment and information management system. The utilization of algorithms and software to generate, transform, interpret information, and predict the development of business processes is essential for enhancing the efficiency of enterprise ecosystems in the digital age;
- formation of innovative business processes. Special spaces such as accelerators, corporate innovation centers, and laboratories are being created and actively function to model the business processes of modern ecosystems. They serve as the foundation and key drivers of the new digital economy;
- implementation of digital reverse engineering requires a set of technologies, hardware, and software tools. These tools are necessary for obtaining a digital model of a finished product, enabling further improvement or modernization;
- ensuring energy efficiency within the ecosystem of enterprises involves certifying them according to LEED and BREEAM standards, which in turn leads to reduced operating costs;
- establishing cross-industry cooperation, interacting with partners in professional associations and consortia, and collaborating with other ecosystems to organise social, economic and technological partnerships;
- implementation of a customer-centric approach to management. The collection, analysis, and intensive utilization of customer knowledge, coupled with a strong customer focus, serve as critical tools for creating competitive advantages within the enterprise ecosystem;
- developing HR partnership system is essential for maximizing the productive potential of human resources in addressing key tasks, implementing business functions, and optimizing production processes through effective cooperation and efficient communication;

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- introducing the concept of lean manufacturing serves as a tool to optimize business processes, aiming to eliminate various losses in the functioning of the enterprise ecosystem.

The purpose of implementing the proposed vectors is to ensure the continuous development and flexibility of participants within the enterprise ecosystem. This involves preparing them for ongoing adaptation to turbulent environmental conditions and accelerated technology diffusion. It also entails implementing new technological architecture solutions, fostering organizational learning, and creating a decision-making system that utilizes data from the product life cycle, supply chain, and all business processes.

CONCLUSIONS

Thus, to summarize the above, we can conclude that in recent years, the most effective functioning of enterprises has been ensured by ecosystem-based optimization, and the concept of ecosystems has gained both scientific and practical recognition. As emphasized by Wurth, Stam, and Spigel (2021), the most effective use of the capabilities of the enterprise ecosystem is possible only with a comprehensive program. This program should include the creation of active partnerships, intensification of the digital transformation of business entities, involvement of the research community, allocation of resources, and favourable tax regulation to create investment incentives. At the same time, the priority task is to establish a productive integration between the participants of enterprise ecosystem. This involves identifying priority areas of development to ensure a synergistic effect.

Moreover, enterprise ecosystem plays a vital role in fostering an ethic of sustainable development, which encompasses developing a conscientious attitude toward the environment as the foundation of life. This includes observing the laws of its development, as well as adhering to restrictions and prohibitions. Additionally, it entails cultivating an ethic of efficient management, rational consumption, and a healthy lifestyle.

The article examines various theoretical approaches to defining the concept of an “ecosystem”, upon which the author presents their interpretation. It is argued that the ecosystem offers optimal pathways and effective tools for fostering innovative economic growth based on the principles of sustainable development.

The article presents a synergistic model of the entrepreneurial ecosystem. The key features of this model include: cross-industry interaction, which maximizes synergistic effects more effectively than corporate ties; diversification of activities with a focus on creating frugal innovations; environmentalization of activities alongside the commercialization of developments; mobility and flexibility of business processes; and autonomy of participants with a commitment to voluntary cooperation principles."

It should be emphasized that the priority of ecosystem sustainable development implies a shift in focus from economic to ecological and social concerns, as well as from material to spiritual and informational values. Besides, it involves harmonizing society's interaction with the environment. That is why there is an urgent need to form a new ecosystem model of economic development. This model should be based on the dominance of elements such as partnership between business structures and the state, broad and diversified support for the innovation activity of enterprises, and greening of activities with efficient resource consumption.

The prospects for further research lie in developing recommendations for the formation and functioning of enterprise ecosystems in specific regions and industries. The unique characteristics of each territory and business processes necessitate an individualized approach to establishing new ecosystems

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THE IMPACT OF FINANCIAL POLICIES ON PROMOTING THE DEVELOPMENT OF GREEN INNOVATION

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***Abstract:** This research investigates the factors influencing the development of green patents and their implications on green innovation. Green financing has the purpose of funding environmental initiatives by directing capital from financial institutions to eco-friendly projects. Through a review of existing literature and empirical analyses, we identify the influence of financial variables and economic policy strategy as key contributors. Preliminary findings suggest that these factors significantly impact the prevalence of green patents, highlighting the importance of policy and financial decisions in fostering environmentally sustainable technological advancements. Our findings reveal a positive correlation between environmental R&D expenditure and green innovation. Moreover, venture capital emerges as a significant driver of green innovation, facilitating the development of environmentally conscious solutions by mitigating financial risks. Additionally, the stringency of environmental policies and the presence of green bonds and carbon taxes demonstrate positive associations with green innovation. Consequently, the main objectives of this article are to examine the impact of financial policies such as R&D, Venture Capital, Debt financing and environmental regulations on the development of green patents and innovation as well as investigate the relationship between green bonds, carbon taxes and green innovation. Ultimately, this research contributes to the ongoing discourse on sustainable development, offering a nuanced understanding of the dynamics driving green innovation.*

***Keywords:** green innovation, financial policies, green patents*

1. Introduction

With the ever-evolving global economy and industry, environmental sustainability has become a crucial topic in recent times, particularly in the field of eco-friendly technologies and further development related to this sector. This, in turn, raises interest in patents and financial factors that affect environmentally friendly technological advancements. There is no universally accepted definition of green banking (Alexander, 2016), and it varies widely between countries. However, some researchers and organizations have tried to come up with their own definitions. Obtaining and using capital for projects that both preserve the environment and provide lenders or investors with a reasonable return is known as “green finance” (Berensmann & Lindenberg, 2019; Ozili, 2021).

In order to achieve sustainable development goals, green finance aims to enhance the amount of money flowing from financial institutions to economic agents engaged in environmental preservation initiatives and activities (Lee & Baral, 2017; Force, 2015). The distribution of cash for environmental preservation, the flow of funds to sustainable trade and

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investment operations, low-risk financing, and the creation of green investment and financing instruments are some of the advantages of green finance (Sachs, Woo, Yoshino, & Taghizadeh-Hesary, 2019). Green finance has become increasingly common in the banking industry in recent decades as a means of safeguarding banks and society from unforeseen economic challenges (such as climate change, financial instability, social unrest, and so on) (Ziolo, Filipiak, & Bak, 2019).

Banks have assisted in the policy-making process by implementing green finance principles through the provision of green loans, bonds, investments, and other financial instruments. Banks play a crucial role in funding the shift to a green economy by facilitating private investment, balancing supply and demand, while considering all potential risks and assessing projects from an environmental and economic point of view (European Fiscal Board, 2017). In our paper, we embark on the intersection of green patents and finances - R&D investment for environmental objectives, environmental-related venture capital investment, financial structure (leverage), and the index of stringency of environmental policies to conduct empirical analysis. The central importance of our empirical analysis is the development of green patents in OECD countries and factors that affect it. Green patents, alternatively termed as eco-patents or environmentally conscious patents, are patents awarded for inventions or innovations possessing environmentally advantageous features or supporting sustainability. These patents are commonly linked with technologies, procedures, or goods that strive to confront environmental issues, advance resource efficiency, diminish pollution, or alleviate the consequences of human actions on the environment.

This study looks into the variables that affect the growth of green patents and how they affect green innovation. This article's main goal is to examine the ways in which financial regulations and environmental tactics impact the spread and encouragement of green innovation. The study's specific objectives are to evaluate how spending on environmental R&D and venture money promotes the green innovation in OECD economies. Furthermore, analyze the impact of strict environmental regulations on the number of green patents and examine how financial structure affects green innovation, with a focus on the debt-to-equity ratio. Lastly this article aims to examine the connections between carbon taxes, green bonds, and green innovation.

2. Methods

2.1 Dependent variable

As a preliminary measure of green innovation, scholars worldwide use the number of patents in respective countries and firms according to the classification of patents (Bo Wang, Lin, & Lingshan, 2021). We obtained the green patent data of the main economies of the world from the OECD database. Main countries of interest are EU members, United States, and Japan, which are the main drivers of green patents and green innovation. The patents data and indicators are convenient for statistical analysis are developed according to the Science, Technology, and Industry directory of OECD. Its coverage includes, but is not limited to, the patent grants and applications to European Patent Office (EPO), US Patent and Trademarks Office (USPTO), as well as patents filed under and belonging to IP5 Patent families. The patent indicators are selected in line with the classes of IPS-International Patent Classification for the

environment-related technology domain. The residence country of the inventor is taken as the reference country of patents. In the case of several joint inventors from more than one country, fractional counts are applied: If there are 3 inventors, then each country gets 0.33 shares of the patent, and so on. The reference date is the priority filing date of the patents, which is the worldwide first filing date and therefore nearest to the invention date of the patent. It is worth noting that patent grants are disclosed 1.5 years after filing, causing a lag in the processing of patent-based indicators, and respectively, our data range covers the period till 2019.

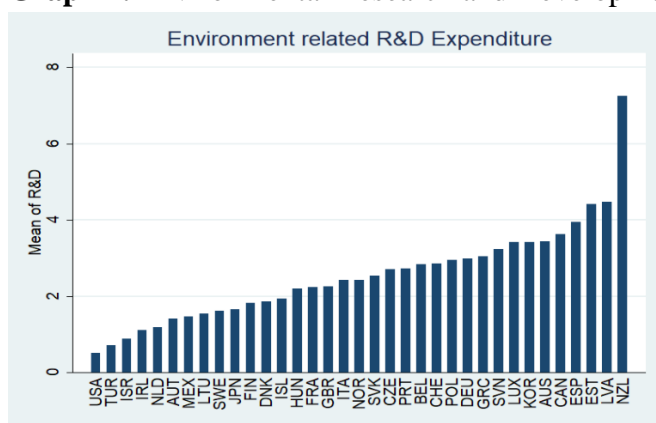
As the patents show the innovative achievement of countries, they are a key measure of the innovation output. They are also useful to quantify the spreading of between technological areas, sectors, firms, and level of international collaboration. Since the criteria for patent grants are well defined, such as being novel, non-obvious, and useful application, and having widely available quantitative data makes patent data a good measure of innovation. Yet, not all innovations are patentable and not all patentable innovations are patented because there are other regimes to protect intellectual property rights, for example, trademarks, copyrights, etc. (Haščič & Migotto, 2015). Although patents are investigated as output indicators, they can also be used as input indicators for subsequent innovation. The identification and classification of the patents are done mainly through the keywords, codes (e.g., CPC, IPC), manual selection, or a combination of several techniques. The data used for the purposes of our analysis is collected according to the methodology of OECD (ENV-TECH), which is deemed to have more coverage in comparison to two other existing methodologies to determine environmental patents based on the code classification, namely Y02/Y04S Tagging scheme (EPO), IPC Green Inventory (WIPO) (Favot, Vesnic, Priore, Bincoletto, & Morea, 2023). The absolute number of green patents per country is normalized by the population size of the country and expressed as the number of patents per 1 million population.

2.2 Independent variables

The first chosen explanatory variable is the amount of environmental-related R&D expenditure as a percentage of gross domestic product, quantified as the total of government, business enterprise, higher education, and non-profit expenditure in different socio-economic objectives. The related data has been obtained from the OECD Science, Technology, and R&D statistics database. This measure is based on the objective of “environment,” which includes studies related to the development of monitoring technologies, to elimination, measurement, and prevention of pollution (Green growth indicators). R&D expenditure has an essential role in innovation by providing the necessary financial support by which new services and products can be developed or existing ones improved (J. Liu & X. Liu, 2023). As shown in Graph 1, we plot the R&D expenditure on environmental factors for selected samples. There exists noticeable heterogeneity amongst the sample countries, particularly in Europe. New Zealand leads the list with more than 7% of the GDP dedicated to environmental-related Research and Development expenses.

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Graph 1. Environmental Research and Development Expenditure

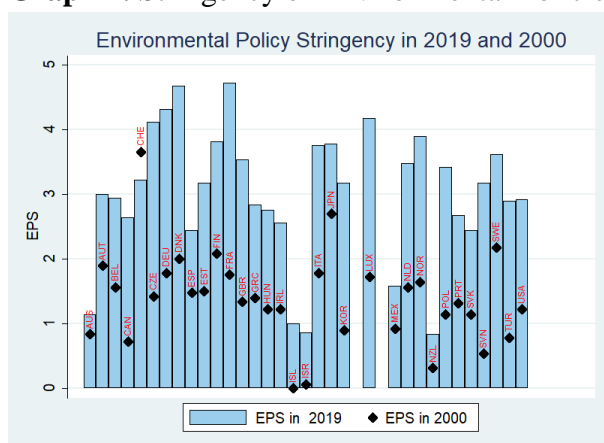


Source: OECD Green growth indicators

The next explanatory variable we chose is the OECD Environmental Policy Stringency Index (EPS), an internationally comparable index of how strict are environmental policies of specific countries. It defines the extent to which a country's environmental policies put an implicit and explicit price on damaging effects and pollution. The index is built on the stringency of 13 environmental policy factors predominantly related to weather pollution and climate change and ranges from 0 (not stringent) to 6 (very stringent). CO2 Trading schemes, Emission and Fuel taxes, emission limits, technology supports are the policy factors to name but a few (Kruse et al., 2022). There has been a considerable increase on average in the Environmental Policy Index over the past two decades.

All countries in the sample increased their stringency score between 2000 and 2019. Furthermore, France, Denmark, and Germany had the highest stringency index in 2019 compared to the other countries in the list. In a similar way, some countries have improved their score more than others. Observing the change in the absolute values, France and the Czech Republic made the largest progress. It is also noteworthy that there exists a large heterogeneity across the countries. As a result of our analysis, moving a country from the 25th percentile to the 75th increases its green innovation—the number of patents—more than one standard deviation at the 1 percent significance level.

Graph 2. Stringency of Environmental Policies in 2000 and 2019

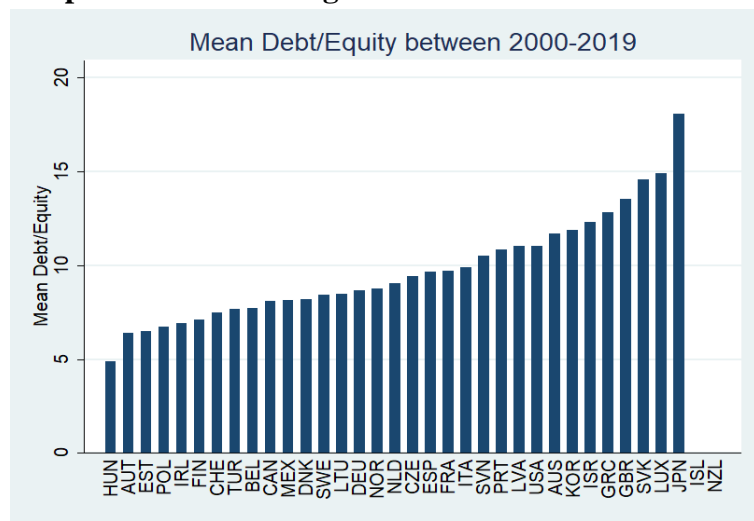


Source: OECD Green growth indicators.

The next explanatory variable we took was the debt-equity ratio of the financial and non-financial entities in the selected sample countries. It reflects the degree to which debt finance is used as a method of financing in the selected countries or how debt-based they are. We extracted data from the OECD's national accounts statistics database. The

debt-to-equity ratio indicates how much a company is using debt or equity to support its operations and it is a measurement of its financial leverage. It is computed by dividing the entire debt of financial firms by the total equity liabilities of the same industry, including shares of investment funds. The total of the obligation categories that include currencies and deposits, debt securities, loans, insurance, pension plans, and other standardized guarantee schemes is known as debt. The market value of the issued shares, including investment fund shares, represents the equity on the denominator side. All governmental and private organizations involved in the financial industry are included in the financial company's sector (S12). For instance, if the ratio is 1.5, the market value of the existing stock is 1.5 less than the amount of outstanding debt. European countries have heterogeneity in terms of their financial structure. That is, some of them have high levels of mean debt value, such as Luxembourg and Slovakia, at more than 14 percent, while others, for example, Hungary, have 4.9 percent, which is the lowest rate in our sample. Japan has the highest mean rate of debt capital in the list, with more than 18 percent.

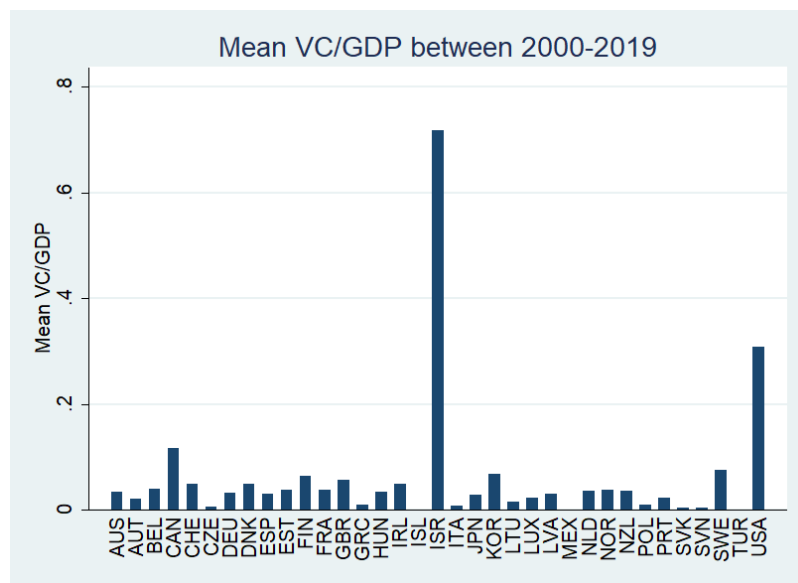
Graph 3. Mean Leverage Ratio



Source: World Bank financial structure database

Next, we change our focus to the impact of equity capital, more specifically the venture capital, on green innovation. We obtained data again from the OECD database about the amount of Venture capital investment in the selected countries for the time period between 2000-2019 normalized by gross domestic product. It becomes clear that the venture capital investment in European countries is considerably low compared to international peers. Mean value of VC investment for sample period ranges from 0.005 percent in Slovakia to 0.8 percent in Sweden (highest in EU). On the other hand, Israel has 0.72 percent mean value of the VC investment, which is the global leader in the world for per capita VC investment.

Graph 4. Mean Venture Capital per GDP



Source: OECD Green growth indicators

2.3 Estimation Approach

We employed a country fixed effects model to estimate the empirical model and for hypothesis testing. We also used the Hausman test to justify the use of fixed effects models rather than random effects. Equation 1 analyzes the effect of selected explanatory variables more precisely, environmental Research and Development investment, environmental policy stringency index, financial structure, and venture capital on the green innovation in the country.

$$P_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \gamma_t + u_i + \varepsilon_{it} \quad (1)$$

where:

- P_{it} (Patent_{it}) is the number of green patents per 1 million population i at time t .
- β_0 is the constant term (fixed effects)
- X_{1it} - (RD_{it}) is the environmental related research and development expenditure normalized by gross domestic product for country i at time t .
- X_{2it} - (VC_{it}) is venture capital investment per gross domestic product for country i at time t .
- X_{3it} - (debt_{it}) represents the financial structure of the country calculated as debt/equity ratio
- X_{4it} - (stringency_{it}) is the index expresses the stringency of the environmental related policies
- u_i represents the country-specific fixed effects, which control for all time invariant characteristics of each entity.
- γ_t represents year-fixed effects (to control for any time-specific factors)
- ε_{it} is the overall error term for country i at time t

We used panel data of the 35-member countries of OECD for the years between 2000 and 2019 to evaluate the effects of selected variables on the green technological evaluation. This selection criterion is the most appropriate one as an overwhelming share of the world's green innovations (more than 90 percent) are either developed or patented in these countries. Moreover, they account collectively for more than 80 percent of the global investment and trade. Because of the time lags in the patent filing and application period, we restricted our

sample period until 2019. We presume this time period is also representative in order to eliminate the possible exogenous effects of the Covid-2019 pandemic on global investment and innovation. The research data is collected for the most part from the OECD green growth indicators database and combined together.

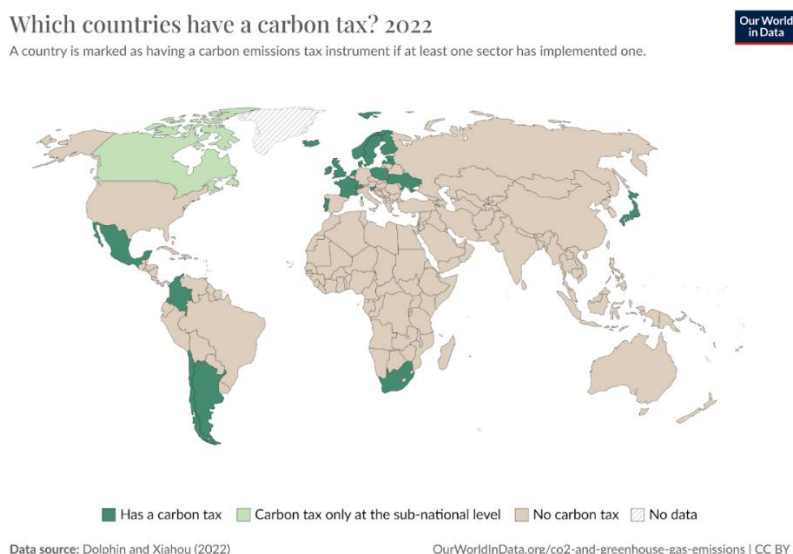
2.4 Carbon Tax

Carbon tax is one of the key mechanisms to provide financial motivation for developing environmentally friendly technologies by increasing the demand for such technologies to mitigate increased costs caused by the carbon tax (Cantone, Evans, & Reeson, 2023). It sets a price directly on the carbon content of the fossil fuels that cause greenhouse gas emissions (GHG). It is different from the ETS, which allows the entities with lower carbon emission to trade their rights with those causing higher pollution levels. Consequently, ETS can define the reduction proportion of the emissions while carbon tax defines the price for it. Burning fossil fuels comes with costs, all of which are not necessarily reflected in the monetary price of them. This includes social costs, air pollution, contribution to climate change, and CO₂ emissions. The purpose of putting a price on carbon is to drive its monetary cost to its true cost with environmental and social impact. First, it makes fossil fuels more expensive in comparison to cleaner alternatives, that is, it encourages the change to greener products.

Second, it makes the GHG emitters pay for it (Ritchie & Rosado, 2022). The opponents of the carbon tax claim that it harms domestic energy-intensive industries in the absence of an international agreement on carbon tax because their competitors would not face a similar policy in their homeland. Hence, unilateral imposition of carbon tax would place the country at a disadvantage and have no effect on the climate (Macaluso et al., 2018).

According to Ojha and Pohit (2020), in spite of the fact that the carbon tax can effectively help to reduce carbon emissions, at the same time it reduces GDP, leading to an undesirable tradeoff between GDP and carbon emissions. We showed the map of countries with the carbon tax as of 2022 (Graph 5).

Graph 5. Countries with the Carbon Tax

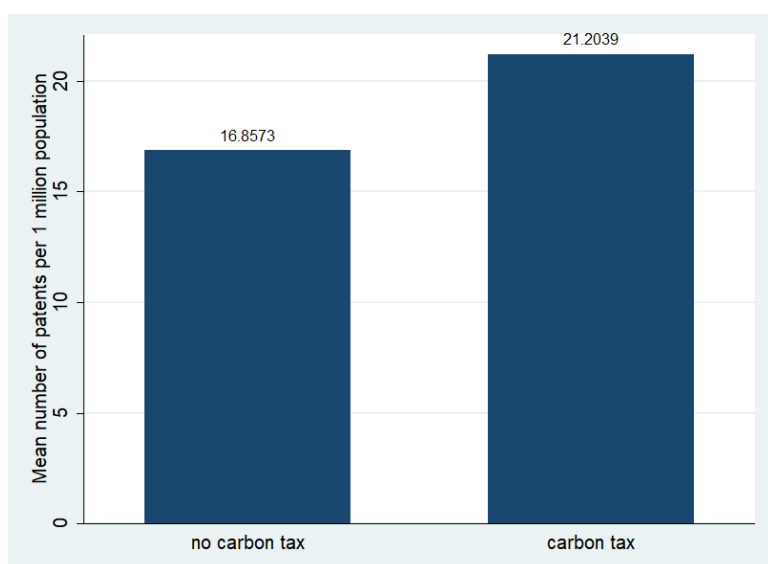


Source: Dolphin & Xiahou (2022)

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The degree and existence of carbon tax varies between the industry sectors. For instance, while the metallurgy industry might have a higher rate of carbon tax, the road transportation may not have at all. Consequently, the countries with the carbon price in any sector have been marked, and the graph does not illustrate the economy-wide tax. It should be noted that only the taxes on CO₂ emission were considered. We divided our sample of countries into two groups: First, those with some form of carbon tax and second, those without one. The number of green patents per capita are comparatively higher on average in the first group at 16 patents than the second one, 21 patents per capita. Although this finding does not imply causal relationship between the two variables, the existence of carbon tax pushes firms to find environmentally friendly alternatives and hence stimulates green innovation.

Graph 6. Carbon Taxes and Green Patents per Million 2000-2019



Source: Dolphin & Xiahour (2022)

2.5 Green Bonds

An increasingly greater role is played by green bonds in the last decade in the field of green financing and reduction of environmental impact. Green bonds are similar to traditional bonds in many respects except their proceeds are used for projects that are intended for energy efficiency, renewables, sustainability, and meet certain compliance requirements. In the field of green finance, green bonds are significant. This holds regarding green bonds just as there isn't a universally accepted definition of green finance. The EU Green Bond Standard, the Climate Bonds Standard and Certification, and the Green Bond Principles are only a few of the voluntary principles and standards that are in place. These guidelines should guard against greenwashing and aid investors as well as green and sustainable bond issuers. The green bond market is the one that is expanding the fastest; still, more work is required to bring this market segment up to speed with the rest of the bond market both from the supply and demand sides.

The first ever green bond was issued by the European Investment Bank in 2007 followed by the World Bank in 2008 November after increasing demand for climate-friendly investments, especially from Swedish pension funds. The issuance of USD 1 billion bonds by

the International Finance Corporation as the largest green bond in the market at the time of issuance in 2013 boosted the expansion of the market (World Bank, 2022). Since then, they have gained particular popularity and enjoyed strong growth from USD 36.7 Billion to USD 487.1 Billion between 2014 and 2022 and peaked in 2021 with USD 582.4 Billion (Statista, 2022). The market outlook for this market moreover seems positive. To limit global warming to 1.5°C in comparison to pre-industrial levels as imposed by the Paris Climate Agreement, cumulative energy investment of 53 trillion is needed by 2035 (International Energy Agency, 2014). In this respect, green bonds can be effective tools to reallocate the investment from high carbon to low carbon projects. The bond financing is especially suitable for financing renewable energy investments as they generally require high initial investment, are long term, and their income stream is linked to inflation. In fact, three-quarters of these infrastructure projects consist of debt financing. Hence, governments need to think of relevant tools and policies to transform the capital from emission-intensive investments to low carbon and climate resilient (LCR) infrastructure.

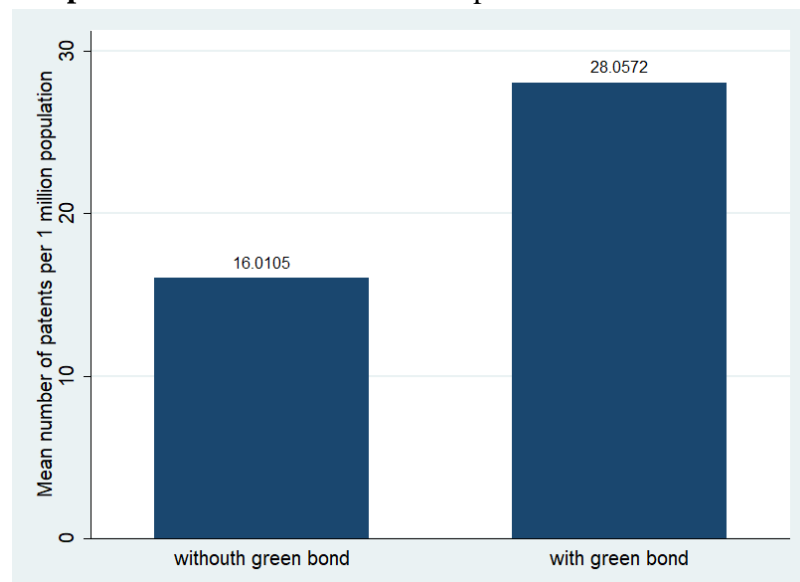
Moreover, green bond investments till now seem to make a remarkable impact on the green transition. More than USD 10 Billion investment through green bonds by the International Finance Corporation between 2010 and 2022 is expected to reduce greenhouse gas emissions by 25.6 million metric tons of CO₂-equivalent per year and to save 868 Million kilowatt hours of energy annually (International Finance Corporation, 2022). A noticeable shift to green finance is already to be observed in public and private institutions. The European Commission intends to issue 30 percent of the Next Generation EU plan's financing with green bonds for sustainable investment. The green reforms are expected to boost the liquidity of the market. If implemented at full scale, all those projects are expected to shrink CO₂ emissions by 44 Million tonnes equivalent to 1.2 percent of total emissions of the EU in 2022. This amount of reduction, for example, corresponds to 80 percent reduction of emissions from the building industry in 2022 in the EU (European Commission, 2023). The impact of the investment varies naturally depending on the base emission level, location, type of project, and so on. Projects relating to renewable energy have approximately one thousand tons of carbon emission savings for each USD 1 Million invested, but transportation projects have on average 600 tons (SP Global). According to Born et al. (2021), although the sustainable debt markets in the Euro area are expanding quickly, sustainable financial instruments—such as environmental, social, and governance (ESG) funds and green, sustainable, and sustainability-linked bonds—represent less than 10 percent of their respective markets. Since 2015, the amount of assets managed by institutional investors and investment funds with a specific focus on sustainability or the green economy has almost doubled. As part of the EU recovery fund, Next Generation EU, the European Commission plans to sell up to 250 billion euros in green bonds between mid-2021 and 2026, therefore increasing the proportion of green financing in the Euro area. Green bonds can contribute to climate objectives mainly through two ways: Firstly, their proceeds are invested in the development of cleaner technology, cleaner energy production, lower carbon footprint, etc. Second, they influence the behavior of the issuer firms positively because of green reporting disclosure and more scrutiny. Hence, they also reduce the company's ability to use proceeds of bonds and moreover compliance and standardization costs further questions the motive to use green bonds.

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It is yet claimed that green bonds are still a choice of preference because of their signaling effect about firms' commitment to environmental standards - signaling argument or just pretending to do so without having tangible results - greenwashing argument (Flammer, 2020). Even if there are a lot of projects and green finance is becoming more and more relevant numerically, there are still not enough funds allocated to achieve a 1.5°C trajectory. According to Delimatsis (2021), a successful strategy towards a relevant sustainable finance sector necessitates a combination of bottom-up initiatives like investor demand or the implementation of financial institutions' social responsibility strategies in addition to top-down engagement by actors like the European Commission, central banks, or other international organizations. It is important to keep in mind that different climate policy measures have an indirect impact on the growth of green finance in this context.

The countries with the green bonds are compared in terms of green innovation with the ones where no green bond has been issued over the sample period 2000-2019. We divided them into two categories: First, the countries where in a particular year a green bond has been issued. Second, the countries where no green bond has been issued at the time. It turns out the first category on average has a higher number of green patents per capita, more precisely 28, than the second one, 16 patents per 1 million. Yet the relationship of the causality is unclear—whether the entities who issue green bonds increase their green innovation or the entities who already have intention to make green innovation prefer to use the green bonds. Nevertheless, green bonds become an increasingly popular tool to finance green innovation globally.

Graph 7. Green Bonds and Patents per 1 Million 2000-2019



Source: International Monetary Fund

3. Results

Table 1. Regression results with and without FE

VARIABLES	(1) OLS No FE	(2) Fixed effects	(3) Robust fixed effects
Rd	0.876**	0.822**	0.822**

	(0.406)	(0.403)	(0.288)
Vc	38.56***	43.91***	43.91***
	(8.052)	(5.593)	(8.824)
Debt	0.583**	0.587***	0.587***
	(0.235)	(0.213)	(0.150)
stringency	10.53***	12.04***	12.04***
	(0.837)	(0.995)	(0.945)
Constant	-19.52***	-23.91***	-23.91***
	(2.866)	(3.697)	(2.129)
Observations	548	548	548
R-squared	0.327	0.272	0.272
Number of years		20	20
Country FE		YES	YES
Time FE		YES	YES

Source: OECD

Table 1 illustrates the descriptive statistics of the sample. The results of regression analysis presented using 3 methods, namely simple regression, fixed effects, and robust fixed-effects. R&D expenditure appears to be positively correlated with the green innovation in all three models with 5 percent statistical significance and 0.82 coefficient value. However, Venture Capital has, in a similar fashion, a coefficient of 43.91 at 1 percent significance level for all methods. The scope of the coefficient is higher with the inclusion of the fixed effects and in comparison, to the other explanatory variables in our model. Next, the capital structure of the entities expressed as the debt/equity ratio has a coefficient of 0.6 with a standard error of 0.21, indicating a positive correlation between patents and leverage at high confidence level (1 percent statistical significance). The last variable in our explanatory variables, namely environmental stringency, has a high coefficient value of 12.04 with 1 percent significance level across three methods. The consistency of the coefficient for explanatory variables across the methods confirms robustness of the model. The interpretation of independent variables is one of the most crucial parts of the regression model. Venture capital plays a vital role in the development of green patents through several factors. Since innovation is capital-intensive and has high up-front costs and risks, the role of venture capital in mitigating the costs of conducting experiments, trials, and tests to make an innovation breakthrough in the field of green innovation is crucial. Furthermore, venture capitalists are more likely to be risk-taking compared to other investors, which positively influences green innovation over the years of development. The stringency of the index of environmental policies measures the strictness of government over the application of environmental regulations, which in turn can highly incentivize green innovation. This index motivates companies and individual researchers to develop new solutions and technologies that should also comply with the environmental policy of the country, depending on how rigorous the government is on implying the policy. Moreover, the recent competition among the countries on reducing carbon footprint and more environmentally friendly solutions incentivizes the countries in improving their environmental policies. This competition can lead to a surge in green innovation and solutions.

4. Discussion

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Based on the information provided in the empirical study, we may draw a number of conclusions concerning the effects between environmental-related R&D expenditure, leverage ratio, venture capital, the stringency index of environmental policies, and green innovation. Our analysis reveals a significant positive correlation between environmental R&D expenditure and green innovation, confirming the findings of previous studies (J. Liu & X. Liu, 2023). Increased investment in R&D dedicated to environmental objectives facilitates the development of new technologies and solutions aimed at reducing pollution and enhancing resource efficiency. This finding aligns with the conclusions of Haščič and Migotto (2015), who emphasized the crucial role of R&D in driving innovation.

The regression results show that venture capital investment has the highest coefficient among the explanatory variables, indicating its substantial impact on green innovation. Venture capitalists' willingness to absorb high risks and upfront costs is essential for funding groundbreaking projects in green technology. This result is consistent with the arguments presented by Berensmann and Lindenberg (2019), who highlighted the importance of venture capital in financing environmentally conscious solutions.

Green innovation and the debt-to-equity ratio are positively correlated, suggesting that businesses with higher levels of leverage are more likely to make investments in green technologies. This finding aligns with the past research findings (Ziolo, Filipiak, & Bak (2019), where the role of financial structure in supporting sustainable projects discussed. A high level of leverage could give businesses the money they need to launch big environmental projects.

One of the noticeable conclusions is the increase in the level of EPS index from between years 2000–2019. Regression results also show how EPS has a considerable influence on green innovation, which can be explained by its effects on creating incentives in the countries, which develops motivation for the green patents.

We also conclude that venture capital has the most considerable effect on the level of green innovation in our sample. The fact that venture capital has the ability to absorb risk and high upfront costs of projects for developing environmentally friendly technology and solutions makes it a suitable way of financing for green patents. Our study demonstrates that the existence of green bonds and carbon taxes is positively associated with the number of green patents. These financial instruments provide incentives for firms to invest in environmentally friendly technologies. This finding is consistent with the conclusions of Sachs et al. (2019), who emphasized the role of green bonds and carbon pricing in promoting sustainable development.

Moreover, we have found a positive correlation between the existence of green bonds and as well as carbon tax on the average level of patents in the selected countries. Although this finding does not imply causality or the direction of it, green patents and carbon incentivize entities to increase their amount of green innovation. In conclusion, the results emphasize how crucial it is to implement focused financial and regulatory initiatives in order to increase green innovation and facilitate the shift to a more environmentally friendly sustainable economy.

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PERSPECTIVES AND DIRECTIONS OF DEVELOPMENT OF ORGANIZATIONAL CULTURE IN THE DIGITAL AGE

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Abstract: *In the conditions of the strong development of digital technologies, the business of organizations in a traditional environment becomes very tight. New digital technologies have implications for modern business operations. Digital trends require changes not only in the way business organizations work (jobs, workplaces and employees) but also a change in the entire concept of organizational culture (behavior and thinking of employees). In order for digital technologies not to become an obstacle to the business of modern organizations, in our work we will identify a new organizational culture that is able to support new technologies. At the same time, we will look at the key elements of the traditional organizational culture, which we have to transform. In the final part, with the aim of improving the business of business organizations, guidelines will be given for the development of a new digital organizational culture that will contribute to the improvement of business, all in the context of adapting to new digital technologies. In the study of digital transformation and organizational culture, the authors employ analytical and synthetic approaches to achieve a deeper understanding. The analytical approach deconstructs elements through qualitative analysis, while the synthetic approach integrates information and theories to form a comprehensive concept. These approaches enable the identification of optimal strategies for different contexts, which is crucial for this study. Overall, the study contributes to theoretical understanding of digital transformation and organizational culture, while also offering practical guidance for organizations undergoing the process of digital transformation.*

Keywords: *organizational culture, digital technologies, digital organizational culture, knowledge, transformation*

INTRODUCTION

In the modern business environment, in response to the challenges of the global market, organizations face the need to introduce new digital technologies in order to achieve their goals. Digital technologies provide enormous opportunities for the creation of new products and services, making them more competitive. By using digital tools, organizations do not benefit only for themselves, but significantly contribute to the development of the entire society. Whether it is a small or a large organization, recognizing the importance of digital technologies is essential for doing business in the modern world. Through the process of digital transformation, every organization should shape a new digital culture that will support all

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aspects of the new business model and ensure success in the digital age. Digitization brings greater efficiency, agility, flexibility, readiness for changes and taking risks in business. However, it also brings with it the need to abandon traditional business approaches and adopt new ways of working that require changes in organizational culture. Therefore, the creation of a new organizational culture becomes crucial for a successful digital transformation and opens new paths to innovative business.

The work is structured in two parts. The first part explores the key factors for successful digital transformation, focusing on the role of digital technologies in improving business processes for their effective implementation. This process requires the development of an innovative organizational culture within organizations. Bearing in mind the frequent changes in organizational culture for the successful implementation of digital transformation and the utilization of its full potential, the second part of the paper is focused on the analysis of organizational culture in the context of the digital age. Considering the complexity and speed of changes arising from digital transformation, it is desirable that organizations have defined guidelines and strategies in order to successfully go through this process. Therefore, in the final part of the paper, guidelines are offered that are crucial for adapting the organizational culture to the requirements of the digital age.

1. Digital transformation

1.1. Key steps towards the implementation of new technologies

In today's business context, the integration of digital technologies becomes necessary for the improvement of business strategy, operational processes, products and services of organizations. This process requires the implementation of digital transformation, which entails adapting the business strategy to new digital opportunities. Effective implementation of this process requires a comprehensive plan that involves different levels of employees in shaping the strategy, starting from operational teams and ending with management. On the way to a successful digital transformation, organizations face certain aspects that require careful consideration. These aspects include the organization's vision and goals, technology and infrastructure, human resources and organizational culture, processes and operations, security and data protection, as well as continuous monitoring and adaptation. They are essential for the successful implementation of digital transformation, enabling organizations to adequately respond to the changes brought about by the digital environment (Fichman, Dos Santos & Zheng, 2014; Fitzgerald et al.; 2014, Bogdan, 2023).

In connection with the above, digital technologies play a key role in improving the business of modern organizations. Digitization enables effective communication and exchange of information inside and outside the organization, which significantly contributes to better business. Through the implementation of technological solutions such as the Internet, mobile devices, cloud computing and Big Data software analysis, companies can improve the quality of products and services, optimize business processes, and reduce business costs. The concept of "Internet" enables the connection of various devices to the Internet for more efficient information gathering and remote control. "Smart companies" integrate information and

production, creating smart products with detailed information for users. Through the use of cloud computing, companies can use applications faster by sharing resources. The application of tools such as Customer Relationship Management (CRM) enables the improvement of connection with customers through the efficient management of data on their engagement. Also, virtual teams enable organizations to achieve effective communication and collaboration without geographical limitations, which further contributes to productivity and innovation in business. Computer networks are crucial for the efficient exchange of information, knowledge, and skills among employees, regardless of their physical location and different time zones. With this system, managers can monitor the work of a large number of employees without the need for direct communication. The use of digital technology brings significant benefits to the organization, which would be limited in a traditional work environment. In this context, it is especially important to empower employees by providing training in the use of advanced technology, which allows them to assume greater responsibilities and authority in the performance of their work tasks (Westerman, Bonnet & McAfee, 2014; Brynjolfsson & McAfee, 2014; Woerner & Wixom, 2015, Gjoni & Elezi, 2023; Blichfeldt & Faullant, 2021).

At the same time, new digital technologies require changes at the management level of the organization, on the part of the management. Managers are required to encourage employees to adopt new skills and technologies through education (education/training). Investing in employee education becomes essential for creating agile teams that are able to quickly adapt to changes and take advantage of digital tools. Through continuous education, organizations can ensure that their employees remain relevant and competitive in the digital era, following the latest trends and technological opportunities (Martínez-Caro; Cegarra-Navarro & Alfonso-Ruiz, 2020; Zhang, Xu & Ma, 2023; Hashimova, 2023).

1.2. Advantages and disadvantages

Digital transformation, although a necessity for organizations in the modern business environment, brings with it both positive and negative sides. The primary advantage of digital transformation is in increasing the efficiency of business processes through automation, optimization of work and elimination of manual processes, which results in faster decision-making and higher productivity. In addition, digital transformation enables organizations to be more innovative, to respond faster to changes in the environment and to provide a more personalized experience to users, which can be key to achieving a competitive advantage (Wokurka, et.al. 2017; Haleem et al, 2022; Davronovich & Mansurjonovich, 2023).

However, the process of digital transformation brings with it certain disadvantages and challenges. The financial investments required to implement new technologies and infrastructure can be significant, which can be a burden for many organizations, especially small and medium-sized ones. Additionally, changes in organizational culture and work processes can cause employee resistance, requiring training, support and engagement to achieve successful integration of new technologies. Also, due to the risk of cyber attacks and violations of data privacy, it is necessary to ensure data protection and security (Haleem et al, 2022).

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Therefore, digital transformation is proving to be a necessary process for organizations in the modern business environment, providing significant advantages, primarily increasing efficiency and innovation (Jilcha, 2020). However, it also brings with it certain challenges, such as high financial investments, employee resistance and increased risk of data security, which require careful management and adequate solutions for successful implementation. Therefore, finding a balance between advantages and disadvantages is crucial for the successful implementation of digital transformation, through properly exploiting its positive sides and minimizing negative effects (Wokurka et.al, 2017; Nadkarni & Prügl, 2021).

In the context of digital transformation, it is important to recognize that changes are not limited to the operational aspects of business, but also encompass deep transformations in organizational culture. In fact, the values and norms of employees represent essential elements in the formation of a new organizational culture that require alignment with the new requirements and goals of the organization in the digital context, and the creation of a new, innovative and successful organizational culture (Haleem et al., 2022).

2. Understanding organizational culture in the digital age

2.1. Concept and classification of organizational culture

Digital transformation also affects the organizational culture, which should adapt to the requirements of digital transformation. Bearing that in mind, in this part we will point out the organizational culture by looking at its concept, key aspects and its improvement. Organizational culture can be defined in different ways, but essentially it represents the way the organization functions, the normative expectations of behavior in it, and the context in which employees and teams operate. (Mumford et al., 2011). It affects the success of the organization and represents its identity that distinguishes it from others (Nyarugwe et al., 2016). Organizational culture can be seen as a set of informal rules (assumptions, beliefs, values, norms of behavior) that the members of the organization adhere to. This perspective, proposed by the authors Deal and Kennedy (1982), emphasizes the structure of organizational culture that shapes the way of working within the organization. Furthermore, research by authors such as Hofstede (2001), Barbera (2014), Petite et al. (2017) also confirm this approach, emphasizing that organizational culture is a combination of shared knowledge and experiences of organizational members that define the work atmosphere. It is important to note that the process of forming an organizational culture is long-term and complex, with part of the content being of a subconscious nature, which represents an additional challenge in changing the organizational culture (Alvesson, 2012).

Regardless of the variations in the definition of organizational culture, the essence of the concept of organizational culture is the formation of a system of values, beliefs and norms within the organization, which is a powerful means of shaping the behavior of employees and is often the focus of organizational changes. When employees within the organization adopt basic values and rules of conduct, it leads to a stronger connection with the goals of the organization and a better fit into it. Such acceptance can result in the formation of a strong and recognizable organizational culture (Barbera, 2014).

Different definitions of organizational culture offer different classifications of organizational culture, taking into account the way in which organizations function and shape the behavior of their members. According to Deal and Kennedy (1982), organizational culture can be classified according to the degree of risk, while Cameron and Quinn (2011) offer a classification according to the flexibility and stability of the company. Handy (1996) distinguishes types of organizational culture according to the distribution of power and orientation to people or tasks. Denison and Mishra (1995), as well as Hartnell et al. (2016) classify organizational culture according to the adaptability and involvement of employees in the organization. Sonnenfeld and Ward (2008) identify organizational culture types according to employee behavior. It is noted that different types of organizational culture can have different characteristics, which support digital technologies to a greater or lesser extent. Accordingly, organizational cultures can be described as modern or traditional. Modern organizational cultures usually support digital technologies and tend to adapt to new technological trends. On the other hand, traditional organizational cultures often show resistance to digital technologies, making it harder for them to adapt to new technological innovations (Wokurka et al., 2017).

Classifications of organizational culture in the context of digital transformation are important precisely because of the need for different adaptations. Digital transformation requires specific approaches and strategies in order for the organization to successfully adapt to new technologies, changed business models and market demands. Here are some reasons why classifications of organizational culture are important in this context: (Williams, 2012; Wokurka et al., 2017; Hartl & Hess, 2017).

- **Different approaches to innovation:** Different cultures have different attitudes towards innovation and change. For example, modern cultures are more open to experimentation and risk, while more traditional cultures are much more cautious. Understanding these differences enables organizations to tailor their approaches to innovation in line with their existing culture.
- **Agility and adaptability:** Cultures that are flexible and adaptable tend to cope better with the changes brought about by digital transformation. Identifying and understanding a culture that supports agility enables organizations to develop strategies to strengthen these characteristics within their organization.
- **Different levels of participation:** Digital transformation often requires the active participation of employees in the changes. Cultures that encourage collaboration and participation can be key to the successful implementation of digital initiatives. Understanding the differences between cultures that support or limit participation enables organizations to adjust their employee engagement strategies.
- **Change management:** Digital transformation usually involves changes in work processes, technology, roles and responsibilities. Therefore, organizations develop different strategies to manage these changes in a way that best suits their specific situation.

In short, different classifications of organizational culture in the process of digital transformation are important because they allow organizations to adapt their strategies and processes in order to better cope with changes and successfully implement digital technologies.

2.2. Key aspects of organizational culture

Organizational culture is a key but invisible aspect within business organizations. Its role is reflected in the fact that it serves as an invisible structure that connects different segments of the company and directs the actions of employees, and therefore has a significant impact on the success or failure of the organization. In the context of digital technologies, understanding the key aspects of organizational culture becomes crucial, given that it has the ability to support or limit the integration of new technological solutions (Williams, 2022).

There are numerous aspects that support digital transformation by creating an environment for knowledge exchange, agility and adaptability, encouraging innovation, as well as employee motivation and engagement (Azeem et al., 2021; Cook, 2020). First, organizational culture plays a vital role in supporting the digital transformation process. Cultures that are open to change and innovation facilitate the adoption of new technologies and business models. By fostering innovation and continuous learning, organizational culture can create an atmosphere that supports digital transformation. Second, organizational culture serves as an environment for knowledge exchange among employees. In the digital age, the exchange of knowledge becomes crucial for innovation and competitiveness. Cultures that support open communication, collaboration and information sharing facilitate this process, encouraging the development of new ideas and solutions. According to KPMG research, most leading companies in Europe and America are focusing on using virtual components such as the Internet and data storage to improve knowledge sharing among employees. Also, research by Ernst & Young shows that a large number of American and European companies are introducing technological capacities. These results indicate the dominant role of technological initiatives in business environments. Third, agility and adaptability are recognizable elements of organizational culture in the digital context. Rapid changes in the market and the technological field require organizations that are able to quickly react and adapt to new situations. Through flexibility and quick adaptation, organizational culture can facilitate this process. Fourth, organizational culture can foster innovation by supporting creativity, experimentation, and risk-taking. Digital technologies often offer new opportunities for innovation, and cultures that support innovative thinking can be the basis for the creation of new products, services and business models. Finally, organizational culture can motivate and engage employees in the digital context through support, recognition of contributions and rewarding success. Motivated and engaged employees influence the success of the organization in the digital age, and organizational culture can provide a framework for achieving this goal (Wokurka et al., 2017). Adaptability, openness to innovation and support for teamwork are often highlighted as key elements for improving organizational culture in the digital age (Nikčević, 2023). These aspects will be discussed in more detail later in the text, through Handy's classification of organizational cultures.

2.3. Improvement of organizational culture through Handy's classification

Management theory starts from the assumption that a strong organizational culture is a very important factor in business success. However, whether organizational culture will

positively affect business success depends on its values and beliefs. When the values and beliefs of the organization are aligned with the demands of digitalization, the organizational culture becomes a powerful tool that inspires employees to integrate their knowledge and ideas through a common digital strategy, thus creating a favorable environment for success and progress. Therefore, the extent to which the organizational culture will support digitalization processes depends more on its content than on the strength of the specific culture. Thus, organizational culture can have a positive influence in a way that will support these processes. While a strong organizational culture with wrong beliefs can have a negative impact on the implementation of a digital strategy (Brynjolfsson & McAfee, 2014).

For a better understanding of organizational culture in this context, we will start from Handy's classification of organizational culture, which distinguishes: culture of power, culture of roles, culture of tasks and culture of support. Understanding their differences can help to improve organizational culture in a digital context.

Organizations with an emphasized culture of power can show resistance to changes brought by digital technologies, because changes in the organization can be experienced as a threat to the existing hierarchy and control. However, research shows that the proper implementation of digital technologies can encourage transparency and participation, which can weaken centralized power and encourage cooperation. Organizations with a pronounced role culture are usually more open to the application of digital technologies because they are focused on defined roles and responsibilities. Digital technologies can improve collaboration and coordination between different roles and teams, thus supporting a role culture. Cultures that emphasize achieving goals and solving problems are often open to experimenting with new technologies that improve business efficiency. Digital technologies can support organizational agility and rapid adaptability to change, which is consistent with the task culture. Organizations that support support and understanding among team members can use digital technologies to strengthen teamwork, communication and collaboration. Digital tools like idea sharing platforms or project management software can support a culture of support. These different types of organizational culture reflect different patterns of behavior within organizations. It is important to recognize the dominant culture in a particular organization in order to understand how that organization responds to the challenges of digitization. The organizational culture that supports the digitization process is usually based on principles such as agility, flexibility and quick adaptations to new digital tools. These organizations are open to change, strive for innovation and support teamwork, democratic leadership style and achieving results. This type of culture provides a favorable environment for the successful integration of new technologies, enabling faster adaptation to changes. Conversely, organizational cultures that are often not adequate for the demands of the modern digital age require adaptation. In these cultures, we typically encounter hierarchical structures where decisions are centralized and made by senior managers (Piccinini et al., 2015; Nafei, 2016).

According to Handy's model of organizational cultures, task culture often stands out as the most suitable for the digital age because of its orientation towards teamwork, creativity and innovation. (Janićijević, 2013). Therefore, it can be said that task culture, according to Handy's model, is closely related to digital culture.

3. INSTEAD OF A CONCLUSION - A NEW DIGITAL CULTURE AND DIRECTIVES FOR ITS IMPLEMENTATION

Bearing in mind the above, digital culture encompasses a number of characteristics that are key to the success of organizations in the digital age. Firstly, innovation is highlighted as a fundamental principle, which implies a constant search for new ideas and technological solutions. In addition, the agility of organizations is emphasized, which means their ability to quickly adapt to changes in the environment, be it technological innovations or changes in the market.

Furthermore, digital culture promotes teamwork as an important component for achieving organizational goals. Collaboration within teams is essential for solving complex problems and implementing innovative solutions. Also, transparency and openness in sharing information within the organization is emphasized, which encourages cooperation, knowledge sharing and faster decision-making.

Flexibility is also an important characteristic of digital culture, given the need for organizations to quickly adapt to changes in the environment. In addition, employees in organizations with a digital culture possess digital skills and are able to effectively use various digital tools and technologies in their work.

Support for continuous learning is an important characteristic of digital culture, because organizations recognize the importance of continuous professional development of employees in order to be ready for new challenges and technological changes. Finally, digital culture creates an inspiring environment that supports creativity and the generation of new ideas through freedom of expression and experimentation.

If the existing culture does not have the key elements of digital culture, measures should be taken in the direction of its redefinition and adaptation to digitization. The transformation of organizational culture requires a systematic approach that includes gradual evolution and a long-term process. Therefore, digital transformation requires the simultaneous evolution of organizational structures and organizational culture. Below, we will highlight several guidelines that can serve as useful directions for this process.

Encouraging creativity and experimentation - Organizations striving for success in the digital age should be ready to embrace and experiment with new ideas and technologies. In this sense, they must encourage creativity among employees. It is also important that organizations create an environment where reflection is encouraged, while mistakes are seen as opportunities for learning.

Adapting to new technologies and changes - Organizations in the digital age should be open to change and adapt quickly to new technologies. In this sense, they should adapt to new circumstances, situations, business requirements and all the challenges brought by the digitization of business.

Transparent communication - In the digital age, it is necessary to establish transparent communication so that employees are informed about all changes and strategies. Open communication will encourage better understanding, cooperation and trust among employees.

This creates a positive atmosphere that strengthens the organizational culture and facilitates the process of business digitalization.

Investing in employee skills development – This guideline is very important for organizations in the digital age. Given that technology is advancing, it is necessary for employees to acquire new knowledge and skills through various trainings. This is the only way they can master digital tools. Therefore, organizations that recognize the importance of continuous education of their employees have an advantage, because they have a team that is able to adapt to rapid changes, which makes them more vital and competitive in the market.

Inclusiveness and diversity - An inclusive culture means creating an atmosphere where employees feel a sense of belonging to the organization. Therefore, their opinion is highly valued and respected. Diversity implies different experiences and skills of employees who will be able to solve problems through new ideas.

Therefore, in the digital age, perspectives on the development of organizational culture include adapting to new technologies and tools in order to improve business efficiency, encourage an innovative approach to work, facilitate communication and cooperation among employees, and promote transparency and openness in the organization. Also, it is important to focus on the development of employees' skills, support continuous learning and adaptation to new trends, as well as preserve the human factor in the process of digital transformation.

The focus on organizational culture as a key factor for successful digital transformation contributes to the theoretical understanding of the interaction between organizational processes, technology, and human resources. The paper emphasizes the importance of adapting organizational culture to the new demands of the digital age to ensure the success of digital initiatives implementation.

Identification of key aspects of organizational culture, such as innovativeness, agility, teamwork support, and continuous learning, provides a deeper understanding of how organizations can shape their culture to effectively integrate digital technologies and achieve competitiveness. Additionally, practical guidelines are offered for organizations seeking to transform their culture to better adapt to the digital era. These guidelines can serve as a foundation for the development of strategies and approaches to change within organizations.

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THE ROLE OF EDUCATION AND TRAINING IN FOSTERING WORKPLACE DIVERSITY AND INCLUSION IN DIGITALLY ORIENTED ORGANIZATIONS

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Abstract: *The aim of this paper is to emphasize the role and importance of employee education and training in digitally oriented organizations so that they can recognize, comprehend, and accept diversity and inclusion in the workplace. Digitally oriented organizations have the advantage of remote work and flexible working hours, which allow for the inclusion of individuals who may not meet the requirements of traditional work environments, involving physical presence for eight hours a day. Conducted desk research shows that education and training on diversity and inclusion in digitally oriented organizations have an important role in raising awareness, promoting understanding, and supporting positive behaviors within all employees. The main advantages of workplace diversity and inclusion are a more diversified and high-quality pool of candidates, a better organizational reputation among employees, increased innovation, and higher profitability. To fully realize these benefits, it is essential that all employees wholeheartedly embrace and foster diversity and inclusion. This paper's theoretical implications include a systematic review and analysis of existing literature on the topic, while practical implication is in providing key recommendations to leaders and managers for achieving high levels of diversity and inclusion in the workplace through education and training.*

Keywords: *workplace diversity, workplace inclusion, digitally oriented organizations, education.*

INTRODUCTION

Digitally oriented organizations that embrace remote work and flexible employment are increasingly adopting diversity and inclusion as core principles of their functioning and business. This shift offers opportunities to individuals who may face challenges securing employment in the traditional, office-bound model that requires physical presence for eight hours a day. In digitally oriented organizations, diversity and inclusion policies are not merely optional; they are deemed essential for survival, growth, and development (Garg & Sangwan, 2021). In recent years, the European Commission has been actively encouraging companies to implement diversity and inclusion practices to meet the requirements of the UN Sustainable Development Goals and the Paris Agreement (Confetto et al., 2023). A diverse workforce is of

great importance for the organization's progress and development (O'Donovan, 2018). Diversity encompasses not only factors such as ethnicity, race, sexual orientation, and gender but also considerations like age, physical and mental abilities, social status, marital status, parental status, place of residence, and work experience (Loden & Rosener, 1991; Champoux, 2011). Diversity, in essence, pertains to any characteristic that distinguishes one individual from others.

Within the realm of human resource management, diversity and inclusion have become increasingly prominent and represent pivotal concepts in contemporary business. The way these concepts are approached can greatly influence a company's success. Human resource management involves diversity management, which is defined as harnessing differences to create business advantages, realizing the potential of all employees, promoting equality, and providing equal opportunities (Greif, 2015). Diversity encompasses the collective mix of differences and similarities, including individual and organizational characteristics, values, beliefs, experiences, backgrounds, preferences, and behaviours. Inclusion, on the other hand, signifies the creation of a work environment where all individuals are treated fairly and respectfully, have equitable access to opportunities and resources, and can contribute fully to the company's success (Talent Intelligence, 2014). Inclusion entails empowering each employee to make their maximum contribution, irrespective of their unique individual attributes. Therefore, inclusion is linked to how employees perceive their importance within the organization, including participation in the decision-making process, involvement in group tasks, and access to information and resources (Mor Barak, 2008). Nowadays, in a digitally oriented world of work, it is of significant importance to offer students and graduates crucial knowledge regarding diversity and inclusion as important aspects of organizational success in the long run (Aškerc Zadavec, 2023). Furthermore, all employees face the challenge of upgrading their existing knowledge and skills, as well as obtaining completely new knowledge and skills suited for the requirements of the digital age (Gigauri, 2020). The ongoing digital transformation involves the adoption of new technologies, which leads to completely new work possibilities in all industries and sectors (Ciderova, Rutkay & Sirotko, 2023).

This paper points out the role and importance of training and education of employees in order to promote and foster diversity and inclusion in digitally oriented organizations. The paper is organized as follows. Following the introduction, an applied desk research method was presented and discussed. The following title focuses on research results and discussion of research findings. Finally, the important findings, implications for the academic community and practice, limitations, and recommendations for future research were discussed.

METHODS

The key goals of the research are: (1) to identify the key benefits of diversity and inclusion in digitally oriented organizations; (2) to assess the current state of diversity and inclusion, and (3) to emphasize the importance of employee education and training in promoting and nurturing diversity and inclusion.

To accomplish the imposed research goals, this paper used desk research of published secondary data to provide a broad and more comprehensive perspective on the topic while also confirming existing theoretical foundations and research findings. The topic was examined and

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evaluated through analyzing existing literature such as books, journals, articles, conference proceedings, business and research reports. The major goal was to highlight the results of prior study findings addressing the relevance and value of education and training in promoting workplace diversity and inclusion, particularly in digitally oriented organizations.

RESEARCH RESULTS AND DISCUSSION

The Benefits of Diversity and Inclusion in Digitally Oriented Organizations

There are numerous advantages for digitally oriented organizations in embracing diversity and inclusion, which contribute to business success and desirable outcomes. Upon reviewing literature, some of the key benefits identified include (Chaudhry, Ymbong Paquibut & Nawaz Tunio, 2021; Hofhuis, van der Rijt & Vlug, 2016; Stevens, Plaut & Sanchez-Burks, 2008):

More diverse and talented candidates: Digitally oriented organizations that adopt remote work access significantly more diverse candidates from any part of the world. Consequently, these companies can focus on candidates with the best competencies. Furthermore, in the digital era, an increasing number of candidates are seeking employment in organizations that promote diversity and inclusion. A Glassdoor survey revealed that 57% of employees and 67% of job seekers regard diversity and inclusion as important elements of the work environment, influencing the recruitment process and employee retention. The survey also found that 72% of women, compared to 62% of men, consider diversity important (Glassdoor, 2014).

Improved reputation of the organization among employees: A Deloitte Australia study in 2013 showed that up to 80% of employees feel they work in a highly successful organization when it is committed to diversity and inclusion. This perception among employees positively impacts overall performance and the attraction of a higher-quality workforce. Employees satisfied with their organization tend to promote a positive image of its culture and values, leading to an enhanced reputation and attracting a wider range of job candidates. In digitally oriented organizations, employees often share their positive experiences and opinions about the work atmosphere and organizational culture on various social and professional networks, thereby positively influencing the organization's reputation and image.

Greater degree of innovation: Research published in the *Harvard Business Review* investigated the effects of diversity on innovation. The study involved surveying 1,800 professionals, conducting 40 case studies, and numerous focus groups and interviews. It explored two types of diversity: innate and acquired. The former includes traits such as gender, ethnic origin, and sexual orientation, while the latter encompasses traits acquired through experience, like working in a different country or with diverse groups. Companies with leaders possessing at least three innate and three acquired diversity traits, termed two-dimensional diversity, were found to outperform others in innovation and performance (Hewlett, Marshall & Sherbin, 2013). A BCG study in 2018 showed a significant positive correlation between diversity and organizational innovation. It surveyed diversity managers, HR executives, and directors of 171 German, Swiss and Austrian companies with up to 10,000 employees and operations in various industries, such as chemistry, technology, goods, finance and healthcare.

The study highlighted that innovation benefits from various types of diversity. The presence of diverse managers, including women or individuals from different countries, industries or companies can boost innovation. This is particularly beneficial for innovation in complex companies with multiple product lines or operating in various industry segments. In addition, it should not be lost sight of the fact that employees with different educational backgrounds have distinct perspectives on observing problems, which can contribute significantly to finding the best solution.

Higher profits: Ethnically diverse organizations are 35% more likely to achieve higher profits, while organizations with gender diversity have a 15% greater chance of the same, as demonstrated by a McKinsey Institute study (Hunt, Layton & Princeet, 2015). According to this study, while diversity does not automatically equate to higher earnings, organizations with rich gender, racial and ethnic diversity within their workforce benefit from varied attitudes and ways of thinking. This diversity contributes to greater productivity, innovation, and reputation through better service provision, leading to improved business results.

Certainly, an inclusive work environment, where employees have the right to vote and express their opinions regardless of the mentioned differences, positively influences business results. Not only are employees more motivated in their work and in contributing to the success of the organization, but this inclusive image is also reflected externally among co-workers, partners and consumers. Many studies have confirmed the positive economic impact of diversity and inclusion. For instance, companies that lack diversity are 1.32 times less productive than those with pronounced diversity (Kasinathan, Mallu & Bozinski, 2024).

Results on Diversity and Inclusion at the Global Level

A large number of organizations and institutions analyse the state of diversity and inclusion at the global level. Additionally, an increasing number of organizations consider diversity and inclusion important topics in their business practices. The results of the research involving over 247,000 students from the 12 largest world economies as reported by Universum (2019), pointed out the following:

- In 2019, 85% of over 2,000 of the world's most desirable employers considered diversity in employment a high priority.
- When asked what diversity means to them, 93% of global talent described workplace diversity and inclusion as cultural diversity, which transcended age, ethnicity or gender.
- Companies in consumer goods, technology, professional services, engineering and manufacturing, and consulting were seen as those investing the most in and communicating their diversity and inclusion initiatives effectively.
- Authentic communication of a company's efforts to create a more inclusive environment is key to gaining a better position in rankings.

A survey of 107 participants about the top priorities of human resources in 2018 showed that for only 8% of them, diversity and inclusion were among the leading concerns. The first place was taken by the digitization of human resources (28%), followed by continuous performance management (26%), then employee experience (24%), adapted organizational design (11%), and only then diversity and inclusion (Gartner, 2018). However, one should consider the limitation of this research - a small sample size that prevents generalizing the

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results. On the other hand, the key advantage of this research is that it provides a general picture of diversity and inclusion.

Many studies conducted in the field of human resources by various global consulting organizations indicate that diversity and inclusion are important factors. McKinsey points out that organizations with a gender-diverse executive team are up to 21% more likely to achieve above-average profits and up to 27% more likely to create long-term value than organizations where one gender predominates in leadership roles (Hunt et al., 2018).

Although the promotion and representation of diversity are significant steps towards business improvement, if the entire organization is not ready and able to adopt and incorporate this diversity into its daily operations, the end results will be suboptimal. It is essential for all organization members to practice tolerance towards their colleagues and associates, embrace and respect diversity, and conscientiously avoid any form of discrimination or exclusion in collaborative projects and activities, particularly based on individual characteristics.

Commitment to diversity and fostering an inclusive culture within an organization is just the beginning. It is crucial for all employees to embrace and embody these values. Often, there are individuals within organizations who may not fully understand the repercussions of discrimination and intolerance and may continue to treat colleagues and associates unfairly based on their differences. Therefore, it is imperative to actively raise awareness and provide comprehensive education and training on diversity and inclusion to all employees, ensuring a truly inclusive and respectful work environment.

The Role of Education in Promoting Diversity and inclusion

Training is a planned organizational activity aimed at enabling employees to acquire the knowledge, skills, and behaviours necessary to perform daily activities and tasks (Noe et al., 2016). The outcome of training is the development of intangible assets, namely human capital, which encompasses knowledge (knowing what), skills (knowing how), systemic understanding and creativity (knowing why), and the motivation to produce high-quality products and services (sincere concern for quality). (Campbell, Coff & Kryscynski, 2012). Diversity training specifically seeks to increase awareness, understanding, or action regarding diversity and inclusion, emphasizing the need to clearly define its purpose and goals. There are two key training models: awareness training and skills training (Roberson, Kulik & Tan, 2013).

Awareness training focuses on developing awareness and understanding of diversity through an informal or emotional approach. This approach draws attention to diversity issues as a foundation for behavioural change. One approach to awareness training involves providing information on topics such as company diversity strategies, the significance of various identities, and the mechanics of stereotypes, prejudice, and discrimination. Another approach involves educating about group dynamics and social categorization processes. A third approach emphasizes increasing self-awareness of personal biases and their impact on behaviour towards others. While this can lead to conflict and negative emotions due to challenging established ways of thinking, it can also motivate positive attitude and behaviour changes, though it may sometimes be stressful or even cause negative reactions.

Skills training is a model designed to equip participants with new skills that enhance diversity and inclusion. A notable shortcoming of this model is the lack of a universally recognized, empirically backed catalogue of diversity skills. Nonetheless, skills such as communication, conflict resolution, and listening are essential to fostering understanding and cooperation. Among the various frameworks for this training, the most renowned is social learning theory, which emphasizes modelling appropriate behaviour, practice and feedback, positive outcomes, and developing self-efficacy - the belief in one's ability to learn and perform new behaviours. This model requires time and significant investment, leading many organizations to prefer the simpler awareness training model.

When designing a training program, it is important to start with a needs assessment. This process, as outlined by Hays-Thomas (2016), included three levels of analysis:

- Individual analysis: Identifying and analysing individuals who need training, considering their education level, habits, and motivation.
- Analysis of knowledge, skills, and abilities: Determining training content based on the required characteristics, knowledge, skills, and abilities for job tasks.
- Organizational analysis: Assessing organization support or resistance to training, alignment with organizational goals, and available resources like funding, time, and personnel.

After conducting the assessment, the information obtained is used for further steps in training design. This involves setting appropriate goals or learning outcomes, detailing what employees will learn or be capable of after training. These outcomes will ultimately be used to evaluate the quality and success of the training. This phase also includes selecting the training environment, methods, schedules, and trainers. After the completed training, it is necessary to collect data in order to identify whether the training met its intended goals. This assessment checks if the results are attributable to the training or other factors. Evaluating the effectiveness of the training is vital to decide whether it should continue, be modified, or be adapted for others. Additionally, it is important to verify if the training has been effectively learned and applied in the workplace, ensuring that participants integrate the learned content into their daily activities.

Digitally oriented organizations are proactive in designing varied learning activities related to diversity. These activities help to enhance collaboration among employees with differing characteristics. Furthermore, keeping in mind the rapid progress of modern technologies, it is crucial to continuously adapt and update the content and strategies of training programs. This adaptation is necessary due to the increasingly diverse skills, knowledge, learning styles, and languages of employees. Decisions about the implementation of training (whether in printed form, traditional lessons, online classes, etc.), should align with the capabilities and preferences of the employees. It is important for managers of digitally oriented organizations to differentiate between diversity training and broader diversity and inclusion programs. While training is a component of these programs, it alone is not sufficient for achieving true diversity and incorporation of these values into the organization. Many organizations require specialized programs to effectively foster and support diversity and inclusion.

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CONCLUSION

This paper highlights the key benefits of diversity and inclusion in digitally oriented organizations, assesses the current state of diversity and inclusion, and emphasizes the importance of employee education and training in promoting and nurturing diversity and inclusion.

Conducted desk research showed that workplace diversity and inclusion are crucial for survival and business success of any organization, especially of those organizations who are digitally oriented. Modern information technologies facilitate diversity and inclusion, making them integral to organizational practices. Digitally oriented organizations leverage the benefits of diversity and inclusion by enabling remote work and flexible working hours. This broadens their talent pool and maximizes the advantages of diversity. The key advantages of workplace diversity and inclusion include a more diverse and high-quality pool of candidates, enhanced organizational reputation among employees, increased innovation, and greater profitability. To fully realize these advantages, it is essential to provide education and training on diversity and inclusion, aiming to raise awareness, promote understanding, and encourage positive practices and engagement by all employees.

The theoretical implications of this paper include an extensive review of current literature and a broadening of theoretical knowledge in a contemporary organizational environment shaped by digital technologies. This provides researchers with a foundation for future research on the topic. This paper's practical implications include providing crucial recommendations and guidance to leaders and managers in digitally oriented organizations on how to provide organizational culture, as well as the overall organizational climate and atmosphere, in order to achieve high levels of diversity and inclusion.

The paper's main limitation was its focus on desk research and secondary data sources. Future study proposals on this topic include conducting empirical research and collecting primary data to gain real insights about the role and significance of employee education and training in fostering and nurturing diversity and inclusion.

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GLOBALIZATION DYNAMICS TO FOSTER GROWTH AND DEVELOPMENT WITHIN CIRCULAR ECONOMY: A CASE STUDY OF ALBANIA

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Abstract: *The linear economy of today's society conflicts with many environmental, social, and economic challenges. As a result, policymakers and researchers prioritize the implementation of the circular economy concept. The European Union supports a smooth transition to a circular economy through the Circular Economy Strategy, the European Green Deal (carbon neutrality by 2050), and the United Nations' Sustainable Development Goals (SDGs). Replacing traditional business models with circular business models necessitates a shift in technology features that incorporate R strategies (refuse, reduce, recycle, etc.). This study looks into how globalization dynamics affect the transition to a circular economy, as well as the implications for growth and development. Albania, as a transitioning economy in Southeast Europe, provides an important backdrop for understanding the problems and opportunities given by globalization when embracing circular economic principles.*

Keywords: circular economy, waste management, innovation, globalization.

INTRODUCTION

Adequate waste management has been in the spotlight for the last decade, as recent media attention highlights the tragic impacts caused by anthropogenic activity on the environment. Due to industrial and economic activities as well as the ever-rising population growth worldwide, the amount of waste accumulated rises in all classifications: domestic, industrial, municipal, agricultural, commercial, *etc.* (Okedu et al., 2022). In this sense, the Circular Economy concept has gained increasing momentum in urban and business settings, while the public, policymakers, and members of the scientific community have given the Circular Economy considerable attention. The Circular Economy concept constitutes a system that tackles global challenges (*i.e.*, climate change, waste, pollution, *etc.*) and is based on three main principles: (i) elimination of waste and pollution, (ii) circulation of products and materials in their highest value form; and (iii) regeneration of the natural environment. The main goal is to decouple economic activities from consumption patterns of limited resources. A circular economy constitutes a resilient system striving to leave nobody behind (Ellen MacArthur Foundation, 2017). However, policymakers can either facilitate or constrict the process by enacting a regulative climate, increasing their authority and proper implementation of their

policies, as well as boosting entrepreneurship (Kruja, 2020b; Ahmeti & Kruja, 2021; Maione et al., 2021).

1.1 Circular Economy in the Focus of the European Union

In the context of developing a modernized and sustainable economy, in December 2015, the EU Commission introduced the Circular Economy Package, which defines the economy as 'where the value of products, materials, and resources is maintained in the economy for as long as possible, and the generation of waste is minimized. Because resource extraction and processing account for half of total greenhouse gas emissions as well as more than 90% of biodiversity loss and water stress, the European Green Deal¹ started a coordinated approach for a climate-neutral, resource-efficient, and competitive economy. Scaling up the circular economy from early adopters to mainstream economic participants would make a significant contribution to attaining climate neutrality by 2050 and decoupling economic growth from resource use, while also maintaining the EU's long-term competitiveness and leaving no one behind.

1.2 Circular Economy in Albania

Regarding the situation in Albania, the circular economy concept is still in its early stages. Therefore, firms may play a significant role in driving the transition to sustainability through their participation in the circular economy (Heras-Saizarbitoria et al., 2023, Marshall et al., 2023, Ting et al., 2023). The circular economy concept was introduced in the draft Integrated Waste Management Strategy (2018-2024) which was produced in January 2018. The revised Integrated Waste Management Strategy focuses on the concept of "zero waste," treating waste as raw materials and managing it through circulatory systems to preserve raw material resources. In the Strategy Policy Paper and Integrated National Waste Management Plan 2020-2035 (The document of Strategic Politics and National Integrated Waste Management Plan 2020-2035) published by GIZ in collaboration with the Ministry of Tourism and Environment, the main aim, mentioned the very beginning of the document is the transition from a linear economy to a circular economy. This document develops on the vision or perception of the "zero waste" concept, that waste is collected and treated as raw material and management is to be done by the concept of circular economy systems, to benefit the standardized use and preservation of raw material resources. The specific objectives of the Strategic Policy Paper aim to provide practical solutions to:

- Address issues in the current management system
- Implement the legal framework in force

Make the necessary preparations to meet the obligations arising from the amendments stipulated in EU Directives, including the ambitious objectives of the Circular Economy Package.

Methodology

The present study is a result of a thorough analysis of the existing literature. Therefore, the methodology used is a literature review. It is a type of academic writing, which helps in understanding a subject in detail. In this article, the sources of information were collected through a search engine named Google Scholar by searching the following keywords: Circular economy, waste management in Albania, x. The data are mainly extracted from local municipalities and the National Environment Agency and Institut of Statistics in Albania and also the Co-plan Report 2020 by the European Commission about Albania.

Results

Accurate and easily accessible data is necessary to assess the growth of the country's circular economy, particularly in key sectors. The evaluation of the current status of circular economy components in Albania is based upon the structure of the Monitoring framework and indicators put forward by the EU.

Production and consumption

Albania has had limited success in reducing waste output through circular economy manufacturing and consumption trends. When you expand this phase, the four indicators described in The monitoring framework will be discussed more below (QAK, 2020).

According to data from the Institute of Statistics, the flow of goods increased by 1.2% to 25 billion ALL in September 2020, compared to the same month the previous year. In 2019, the flow of products decreased.

Approximately 4% higher than in 2018. However, imports have consistently climbed by 19% between 2015 and 2019.29 Imports increased by 0.3% compared to the same time last year. During the first nine months of 2020, exports declined by 13.6% and imports by 10.9% compared to the previous year (INSTAT, 2020).

According to 2019 statistics from the Institute of Statistics, there were about 1.2mil. ton of urban waste generated, where the dominant constituent is organic waste which counts for about 58.4% of total waste. The rest is a mixture of wood, paper/paperboard, glass plastics, textiles, metals, etc. listed in descending order. The major waste generators include the oil industry, cement production, steel and mining, and households. (Ibid)

Food production generates waste throughout the manufacturing and delivery process. The majority of food waste comes from home cooking, restaurants, catering, and retail establishments. Food waste occurs when manufacturing resources, such as water, energy, and limited environmental resources, are wasted. Food waste undermines the circular economy concepts. Managing food waste properly is challenging due to a lack of data and variable waste generation sources. This would assist both societal budgets and the environment. (European Parliament, 2021).

Waste management

Sustainable waste management in Albania remains at a relatively low level, with urban waste management services only covering about 87.9% of the resident population, residing

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mainly in urban areas (referring to INSTAT in 2019), marking an increase of 22.2% compared to the previous year. The National Territory Council approved the National Plan for Solid Waste Management³³ on January 1, 2020. The strategy aims to provide sustainable Solid garbage Management services across the country, including minimizing and recycling garbage, reducing uncontrolled and unsanitary deposits/landfills, and protecting the environment. The current strategy aims to standardize national waste management guidelines to align with EU legal frameworks, similar to the previous one (Qarkonomi, 2020). The approach aims to preserve both the environment and human health and can promote sustainable waste management by implementing policies, financing efficient practices, separating waste streams at the source, and encouraging businesses to recycle and reduce waste output. (World Bank, 2019) Albania lacks the necessary infrastructure to manage waste in an environmentally acceptable manner, including decreasing, reusing, collecting waste separately, and recycling, which are the most ecological activities according to the waste hierarchy pyramid. With linear Economy being our current economy model, every product we buy and consume, for instance, smartphones, is mostly purchased with the sole purpose of replacing old ones. The latter gets disposed of and creates waste, resulting in larger issues for a planet with finite resources (Taylor, 2020).

Secondary raw materials

The usage of secondary raw materials accounts for a low or insignificant number of materials used for making new products, considering that the amount of recycled and reused wastes constitutes a small portion of the total waste volume.

Metals: Scrap metal recycling is prevalent in Albania. Steel, aluminum, copper, and other metals are collected, processed, and reused in various industries.

Plastics: Plastic recycling efforts have been increasing in Albania to mitigate environmental pollution. PET bottles, HDPE containers, and other types of plastics are collected and recycled into new products or materials.

Paper and Cardboard: Recycling paper and cardboard is another significant aspect of waste management in Albania. These materials are collected from households, businesses, and industries, processed, and reused to produce new paper products.

Glass: Glass recycling programs exist in Albania, focusing on collecting glass bottles and containers. Recycled glass is melted down and used to manufacture new glass products.

Organic Waste: Organic waste, such as food scraps and yard waste, is often composted to produce organic fertilizers or biogas for energy generation.

Textiles: Textile recycling initiatives are emerging in Albania to address textile waste from clothing and other textile products. Used textiles are collected, sorted, and either recycled into new fabrics or repurposed for various applications.

Electronics: E-waste recycling programs aim to collect and properly dispose of old and obsolete electronic devices, such as computers, smartphones, and appliances. Valuable materials like metals and plastics are extracted for reuse, while hazardous components are disposed of safely.

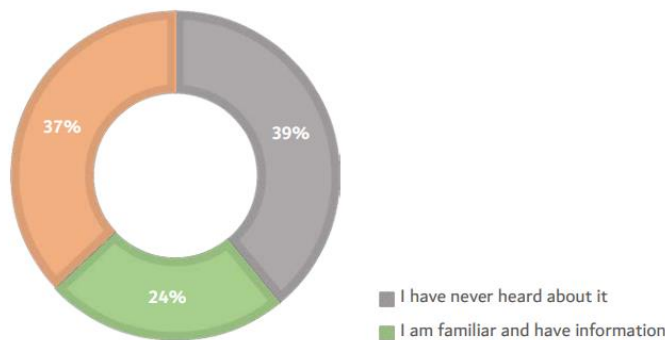
Efforts to improve recycling infrastructure and promote sustainable practices are ongoing in Albania, driven by both government initiatives and private sector involvement.

Competitiveness and innovation

Albania is at an early stage of ensuring competitiveness and innovation, as seen by its numerous circular economy initiatives. Albania has been gradually enhancing its competitiveness and fostering innovation in recent years. Efforts include improving infrastructure, investing in education and skills development, and promoting entrepreneurship. Initiatives like the National Strategy for Development and Integration aim to strengthen the business environment and attract foreign investment. Additionally, the government has been focusing on digitization and promoting research and development to spur innovation across various sectors. However, challenges such as bureaucracy and limited access to finance still need to be addressed to further stimulate competitiveness and innovation in Albania. Advance sustainable practices for all parts of the circular economy. The Institute of Statistics collects data on creative contributions from small and medium-sized businesses in technology, telecommunications, and optical, electronic, and computer device manufacturing.

The Centre for Competitive Skills in Albania conducted a quantitative study on Circular Economy Awareness and Sensitivity among the general public and businesses. (Qarkonomi 2020). Questionnaires were distributed to the public and businesses to assess their familiarity with the term "circular economy."

Figure 1
Public Awareness of Circular Economy in Albania

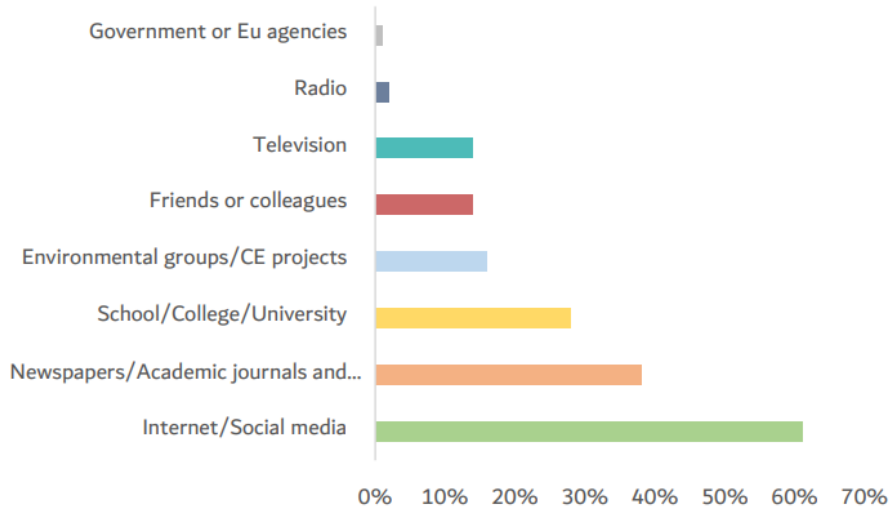


*Source: Study Report on Circular Economy Awareness & Sensitivity among General Public and Businesses (2020)

Based on the Study Report on Circular Economy in Figure 1 about Public Awareness & Sensitivity 24% of the population are familiar with Circular Economy and have information, 37% are familiar and do not have any information and 39% have never heard about it.

Figure 2
Business Awareness on Circular Economy in Albania

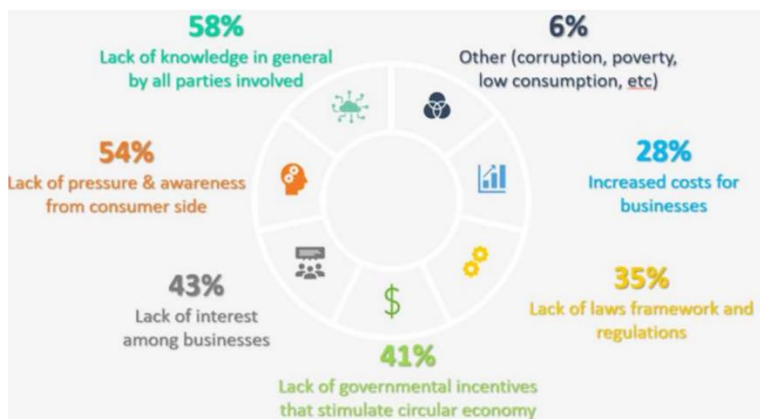
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*Source: Study Report on Circular Economy Awareness & Sensitivity among General Public and Businesses (2020)

The data in Figure 2 represent that Online marketing, especially social media, is the main source of information among Albanians about the Circulating Economy, a finding which is consistent with the general information behavior of the country in recent years. Traditional media such as TV and Radio, have little role in this matter due to their low concentration in sustainability and chronicles of international development, and high concentration in the news local and daily. The audience complains about the lack of documentaries about science, technology, and new economic trends on Albanian television platforms. Newspapers, magazines, and academic publications are an important source of information for 37% of those familiar with the circular economy, followed by the educational system and groups of the environment.

Figure 3
The main barriers to Circular Economy in Albania



*Source: Study Report on Circular Economy Awareness & Sensitivity among General Public and Businesses (2020)

Figure 3 above summarizes the perceptions of citizens and entities on the main barriers of circular economy implementation in Albanian to be lack of knowledge in general by all parties involved (58%); lack of pressure and awareness from the consumer side (54%); lack of interest among businesses (43%); lack of government incentives (41%); lack of laws framework and regulations (35%); increased costs for businesses (28%); corruption, poverty, low consumption (6%). Improving the circular economy in Albania involves a multi-faceted approach that addresses various sectors and stakeholders. Here are some strategies to enhance the circular economy in Albania:

Policy Framework Enhancement: Strengthening policy frameworks to support circular economy principles is crucial. This includes implementing regulations and incentives to promote waste reduction, recycling, and sustainable production practices. Additionally, integrating circular economy principles into national development plans and strategies can provide a cohesive roadmap for sustainable growth.

Investment in Infrastructure: Investing in infrastructure for waste management, recycling facilities, and renewable energy is critical. Building a strong infrastructure network will make it easier to gather, classify, and process resources, increasing resource efficiency and lowering environmental impact.

Promotion of Innovation and Technology: Encouraging innovation and technology adoption can boost efficiency and sustainability across a variety of industries. Supporting research and development projects for eco-friendly materials, waste-to-energy technology, and circular business models can boost economic growth while reducing environmental impact.

Capacity Building and Education: Providing training and educational programs on circular economy ideas can increase awareness and capacity among enterprises, government organizations, and the general public. Workshops, seminars, and vocational training can all help to promote sustainable practices and develop a culture of resource conservation.

Encouragement of Circular Business Models: Encouraging enterprises to use circular business models such as product-as-a-service, remanufacturing, and sharing platforms can help to improve resource efficiency and reduce waste generation. Incentives, tax benefits, and financial support for companies that embrace circularity can help to drive adoption.

Public-Private Partnerships (PPPs): Encourage collaboration among the government, private sector, and civil society organizations to drive circular economy initiatives. PPPs can use their resources, skills, and networks to create novel solutions and expand successful interventions.

Consumer Awareness and Behavior Change: It is critical to educate customers about the benefits of circular economy practices and encourage them to adopt sustainable purchasing habits. Public awareness efforts, eco-labeling schemes, and green procurement rules can help customers make educated decisions and support firms that are committed to sustainability.

Integration with Regional and Global Initiatives: Aligning Albania's circular economy goal with regional and global initiatives has the potential to improve cooperation, information exchange, and resource sharing. Participating in circular economy-focused international forums, collaborations, and networks can help you gain access to best practices, funding

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possibilities, and technical assistance. By implementing these strategies in a coordinated manner, Albania can advance its transition towards a circular economy, fostering sustainable growth, environmental protection, and social well-being.

CONCLUSIONS

The need to implement and promote sustainable economic activity in the global market is increasing limited resources. The primary purpose of this research was to better understand what the Circular Economy is and how it benefits the Albanian market. CE attempts to preserve raw materials and keep them at their best value while minimizing pollution, which includes gas emissions, energy leakage, and water contamination. Circular Economy's business model is concerned with the sustainability of the environment. CE is not very common in Albanian business. The lack of local government to push the implementation of the circular economy business model is discouraging, however, it is willingness and determination to implement green behavior from companies in Albania and the said business model is only beginning to develop. The circular economy can address the problems of waste pollution and the depletion of raw materials from an environmental perspective. In terms of business, the circular economy may be very advantageous and opportune for enterprises; it can help with brand extension and new market expansion.

Improving the circular economy in Albania necessitates a multifaceted strategy combining governmental policy initiatives, private sector engagement, public awareness campaigns, and collaborative efforts among stakeholders. Key measures include the development and implementation of comprehensive policies promoting recycling, waste reduction, and sustainable production methods, alongside the establishment of Extended Producer Responsibility (EPR) programs. Investment in recycling and waste management infrastructure, coupled with the promotion of green technologies, will be crucial.

Additionally, raising public awareness through education campaigns and integrating circular economy concepts into educational curricula are essential steps. Supporting circular businesses with financial incentives and fostering collaboration among various sectors will further accelerate progress. Monitoring progress and adapting strategies based on evaluation findings are vital for sustained success in transitioning Albania toward a more circular economy. The linear model of consumption and production predominates, leading to resource depletion, environmental pollution, and landfill overflow. However, there is growing recognition among policymakers, businesses, and civil society of the need to transition towards a circular economy model. Efforts are underway to improve waste management practices, promote recycling initiatives, and encourage the adoption of sustainable production methods. Despite challenges such as limited financial resources and institutional capacity, there is a burgeoning interest in circular economy principles, driven by the potential for job creation, resource efficiency, and environmental preservation. As Albania endeavors to align with European Union sustainability goals and enhance its competitiveness on the global stage, the promotion of circular economy practices is becoming increasingly integral to its development agenda.

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PROGRESS OF THE MICROFINANCE SECTOR IN ALBANIA, CURRENT CHALLENGES AND THE PERSPECTIVE OF THIS SECTOR

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Abstract: *The paper presented by the authors aims to research the role of Microfinance in Albania over the years, especially in improving living conditions for the less privileged groups. The authors have tried to give a summarized panorama regarding the progress and evolution of Microfinance in the state of Albania. Portraying the latter as a good alternative solution to the shortcomings of the Traditional Banking System, to address the needs of certain segments of the population. The analysis used by the authors focuses on the major and current challenges that the Microfinance sector in Albania is facing, it also examines the perspectives and potential future opportunities of this developing sector in our country. Since most of the economic entities that operate in our country are small and medium-sized businesses, where family businesses account for a significant number of the total number of economic entities, the authors have considered it important to research this segment of the economy.*

Keywords: *Microfinance, Financial System, Financial Supervision Authority, Digitization of financial services in relation to market demands.*

INTRODUCTION

In this paper, the authors have tried to present a comprehensive overview of the financial system in Albania, but with the primary focus on the financial sector of microfinance. The authors of this paper, based on official data, present the evolution of the Microfinance sector from the 1990s to the present day. The researchers in this work are based on official secondary data provided by prestigious national and international institutions. Microfinance has made an important contribution over the years to the Albanian economy. Over the years, microfinance has facilitated lending to individuals and businesses that had difficulty accessing the banking sector. At the end of this paper, the authors present the findings and give their opinions and suggestions regarding this sector.

THE HISTORY AND PROGRESS OF FINANCIAL INSTITUTIONS IN THE SPECTRUM OF MICROFINANCE IN ALBANIA.

Microfinance in Albania during the 1990s was seen as an essential instrument for the population and small businesses that did not have access to the traditional banking system. Microfinance institutions during this period mainly offered small loans, with the aim of alleviating poverty and encouraging entrepreneurship. This sector became an important financial source for farmers and small businesses. During this period, microfinance, through its programs, has pointed out that it is possible to give loans to low-income families by reducing the high interest rates, even in many cases requiring guarantees in relation to the collateral (Johnson, 1997). Improving the living conditions of the low-income classes and their exit from poverty through financial and social inclusion is the primary objective and the main reason for the existence of microfinance (Milana, 2020). Programs during this period were aimed at alleviating poverty and extending services to millions of poor and diverse families around the world. A group in the formation of economic theory shows how new contractual forms of a key to the success of microfinance - issues of lending contracts in the group with a common purpose (Morduch, 1999).

During the period from 2000 to 2010, microfinance institutions in Albania were transformed and expanded, offering a wider spectrum of financial services, with improved quality. This period brought a positive impact on the development of local communities, enabling wider access to financing, especially for marginalized groups and rural areas. The competitiveness between the microfinance institutions in Albania during this period began to increase between the different operators operating in our country. Also, this was a characteristic that emerged as evidence in many different countries of the world that were developing during that period of time. The competition between microfinance institutions operating in developing countries has grown significantly, especially during the first five years of the 2000s (McIntosh, 2005).

During the period from 2010 to 2020, the microfinance sector in Albania faced new and complicated challenges, such as managing the impact of the global financial crisis. The microfinance sector has become a major factor in the country's economic development, especially in rural areas. The 'microfinance revolution' is the term often used for the successful expansion of small-scale financial services to the poor with high repayment records in developing countries (Kono, 2010). Microfinance institutions further improved risk management and diversified services to expand financial access and increase the number of clients (Assefa, 2013). This period brought an increase in the impact of microfinance in the economy and society, helping communities and individuals in need of these services (Cocoli, 2022). During this period, the microfinance sector had a positive impact on the local economy, especially for groups with lower access to the financial system. Also, this sector has increased the focus on investments that help individuals and underprivileged communities (Loca, 2014). The latest perspectives and developments of microfinance in Albania from 2020 onwards are presented below. The poor strata of the population and small businesses were particularly challenged by COVID-19, forcing microfinance institutions to take support measures, such as extending loan terms or restructuring them (Zheng, 2021).

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This situation was similar in other countries that are part of the Balkan peninsula, as for example in the case of the state of Romania, in which the application of restrictive measures to combat and prevent the spread of the SARS-CoV-2 virus, profoundly influenced the crediting of various subjects during that period (Antik, 2022). During the year 2023, the institutions operating in the field of microfinance in Albania have begun to prioritize technological developments and digitization: This process requires investments and training, for the coordination of new technology with current operations (Scan TV, 2023).

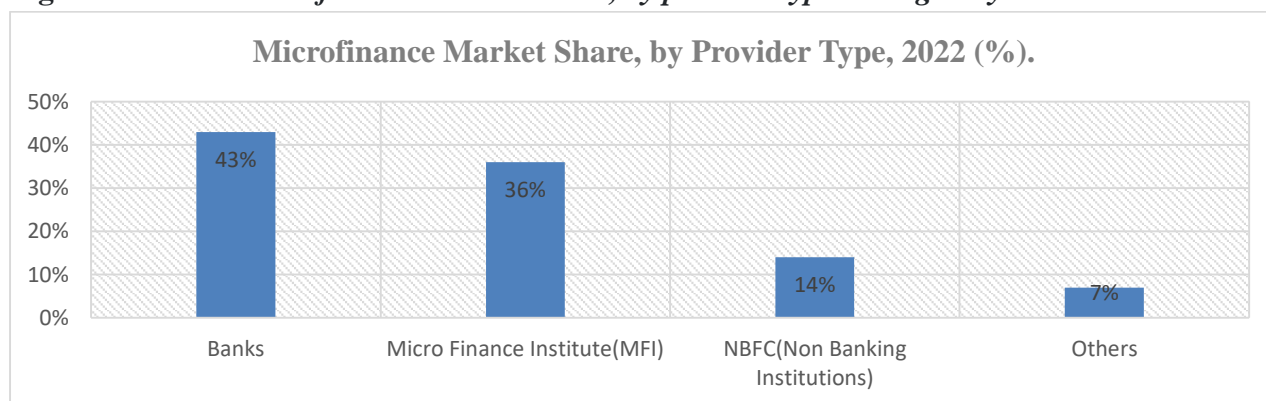
METHODOLOGY

The quantitative data used by the authors regarding microfinance in Albania have been provided, using the statistical data located in the Data Base of the Central Bank of Albania. These data were processed by the authors during the month of March 2024 (Financial_Stability/Financial_Stability_Indicators, 2024). Some of the secondary data are provided by Precedence Research, which is a Canada/India based company that specializes in strategic market studies and from the European-Microfinance Network (Network, 2024). The processing of these data, graphical representation, was carried out by the authors using the Microsoft Excel computer program. The interpretation of the data related to the Financial System in Albania with the main focus on microfinance was carried out by the authors.

THE MICROFINANCE INSTITUTIONS OPERATING IN GLOBAL RANKING

In the global ranking for the year 2022, based on the statistics published by Research, Precedence, it results that: Global Microfinance Markets had a Size of 226.37 billion American Dollars (USD). It is claimed that by 2032 this market will reach the value of 646.25 billion American Dollars (USD) (precedenceresearch, 2023).

Figure 1: Global Microfinance Market Share, by provider type during the year 2022



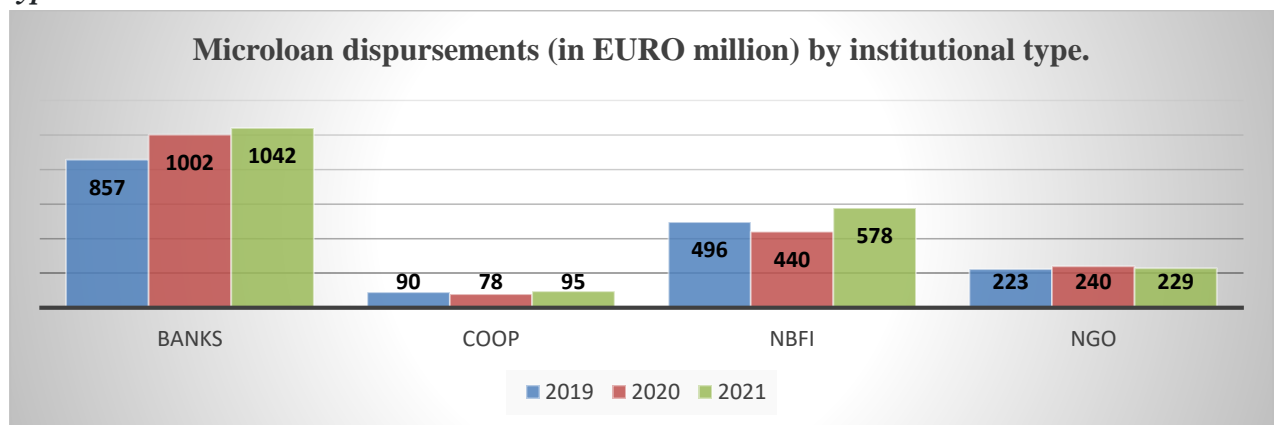
Source: Precedence Research (2023).

Based on the data published by Precedence Research during the year 2023, it results that: Financial institutions such as Universal Banks, made up 43% of the total financing at the micro level at the global level. Financial institutions of the Micro Finance Institution (MFI) type made up 36% of the total of microfinances globally. Financial institutions of the NBFC type Non-Banking Institutions made up 14% of the total of microfinances globally.

Other financial institutions own 7% of the total financing at the micro level at the global level. In the North American Region, the institutions of the microfinance sector offer a variety of microloans, with a focus mainly on small businesses and individuals with low incomes. The United States of America and the state of Canada are the main countries that during 2023 have given a special role to the demand for microfinance in the North American Region. Based on global regional statistics of 2023, the economic sector in which Microfinance is included dominates in the Asia region and the Pacific region.

Based on the opinions of different experts in this sector, it is concluded that: this growth of this financial sector can be attributed to the increase of initiatives undertaken by the governments of these countries. The governments in these regions aim to reduce poverty in the population and improve living conditions for individuals. In Asia region and in the Pacific region, a good part of the population lives in rural areas and a good part of them have limited access to the services offered by second level banks. In the region of Europe, during the year 2022, it was found that: The State of Germany, the United Kingdom and France are the three main countries with the most developed system in relation to microfinance (MFC, 2022). In 2019, the banking sector in Europe has financed micro lending worth 857 million Euros. During the year 2020, the banking sector has financed micro lending in the value of 1002 million Euros, or in other words 145 million Euros more than last year 2019. During the year 2021, the banking sector has financed micro lending in the value of 1042 million Euros, or to put it another way, 40 million Euros more than last year 2020. In 2019, the Coop financial sector in Europe has financed micro lending in the amount of 90 million Euros. During the year 2020, the Coop financial sector has financed micro lending in the value of 78 million Euros, or in other words 12 million Euros less than last year 2019. During the year 2021, the Coop financial sector has financed micro lending in the value of 95 million Euros, or in other words 17 million Euros more than last year 2020.

Figure 2: Microloan disbursements (in Euro million) in 2019, 2020,2021, by institutional type



Source: Microfinance in Europe, Survey Report (December 2022).

In 2019, the NBF financial sector in Europe has financed micro lending in the amount of 496 million Euros. During the year 2020, the NBF financial sector has financed micro lending in the value of 440 million Euros, or in other words 56 million Euros less than last year

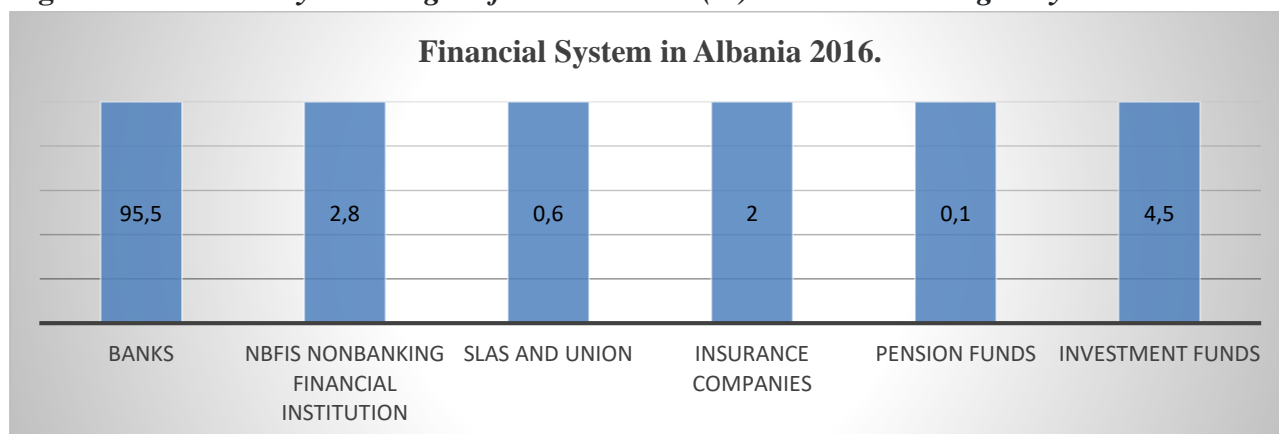
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2019. During the year 2021, the NBF financial sector has financed micro lending in the value of 578 million Euros, or in other words 138 million Euros more than last year 2020. In 2019, the NGO financial sector in Europe financed micro-lending in the amount of 223 million Euros. During the year 2020, the NGO financial sector has financed micro lending in the value of 240 million Euros, or in other words 17 million Euros more than last year 2019. During the year 2021, the NGO financial sector has financed micro lending in the value of 229 million Euros, or in other words 11 million Euros less than last year 2020. Based on the publication of the Financial Supervision Authority in Albania (AMA), Albanian Microfinance during 2022 had in its composition the most consolidated non-banking financial institutions, with microfinance as their main activity, which together owned a loan portfolio with a surplus of 382.3 million euros in total. Also, these economic entities during 2022 owned more than 170,000 customers. (Association, <https://ama.com.al>, 2024)

RESULTS, PROGRESS AND PERFORMANCE OF MICROFINANCIAL INSTITUTIONS IN ALBANIA FROM 2016 TO 2022

Below, the authors have presented in a summarized way the Financial System in Albania, with the opposite of the financial institutions that make it up for the time period from 2016 to 2022.

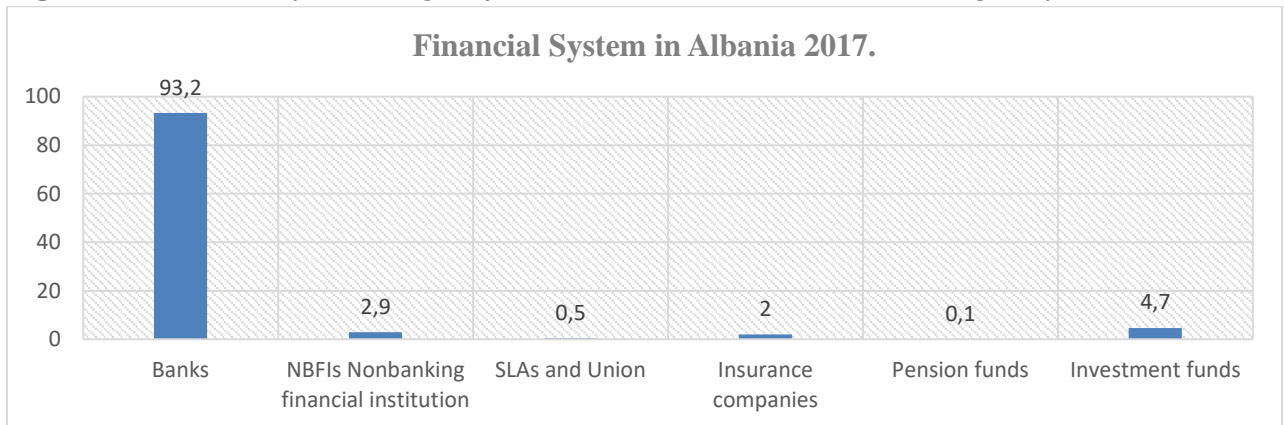
Figure 3: Financial System weight of assets to GDP (%) in Albania during the year 2016



Source: Bank of Albania (2024).

Below is the composition of the Financial System in Albania for the year 2016. The financial sector in which they participate, the Banking Sector, comprises 95.5% of the entire Financial System in Albania, while the remaining 4.5% is made up of Financial Institutions present in the System. The Non-Bank Financial Institutions sector comprised 2.8% of the entire financial system in 2016. Financial institutions such as: SLAS and Union during 2016 comprised 0.6% of the entire Financial System in Albania. Pension funds during 2016 comprised 0.1% of the entire financial system in Albania. Pension Funds occupied the last place in terms of the Financial System of that year. The financial sector in which they participate, Investment Funds in Albania, made up 4.5% of the entire system for 2016 and took the second place in the total Financial System.

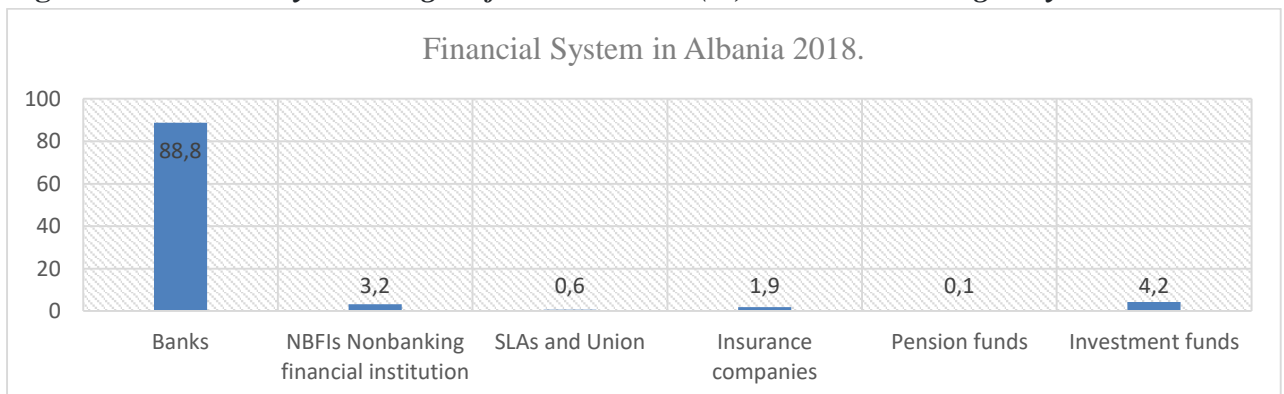
Figure 4: Financial System weight of assets to GDP (%) in Albania during the year 2017



Source: Bank of Albania (2024).

The Banking Sector in Albania during 2017 comprised 93.2% of the entire Financial System. Compared to the previous year, 2016, the specific weight of this sector has decreased by 2.3%. The Non-Bank Financial Institutions sector comprised 2.9% of the entire system in 2017. Compared to 2016, this sector has increased by 0.1%. SLAS and Union comprised 0.5% of the entire Financial System during 2017, compared to the previous year, this indicator decreased by 0.1%. Pension funds comprised 0.1% of the Financial System during 2017. During 2017, Investment Funds comprised 4.7% of the entire system. These Institutions occupied the second place in terms of importance during this year. Compared to the previous year, the weight of this voice increased by 2% compared to 2016. The financial sector in which they participate, insurance companies during 2017 comprised 2% of this market.

Figure 5: Financial System weight of assets to GDP (%) in Albania during the year 2018



Source: Bank of Albania (2024).

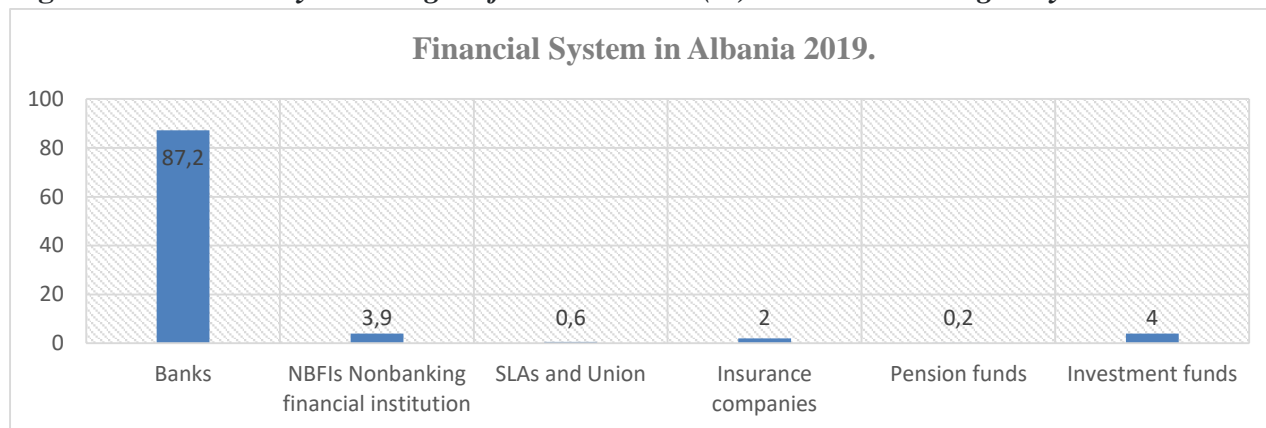
The Banking Sector in Albania comprised 88.8% of the entire Financial System. Compared to a year ago, the weight of this sector has decreased by 4.4%. The sector in which Non-Bank Financial Institutions are included during 2018 comprised 3.2% of the entire Financial System. Compared to 2017, the sector that includes Non-Bank Financial Institutions has increased by 0.3%.

Financial Institutions SLAS and Union comprised 0.6% of the entire System during 2018. Pension funds during 2018 comprised 0.1% of the entire Financial System. Investment

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Funds made up 4.2% of the entire system for 2018. These Institutions were the second most important in 2018. Compared to the previous year, the weight of this item decreased by 0.5%. Insurance companies made up 1.9% of this market during 2018. Compared to a year ago, this sector, where insurance companies are a part, decreased by 0.1%.

Figure 6: Financial System weight of assets to GDP (%) in Albania during the year 2019

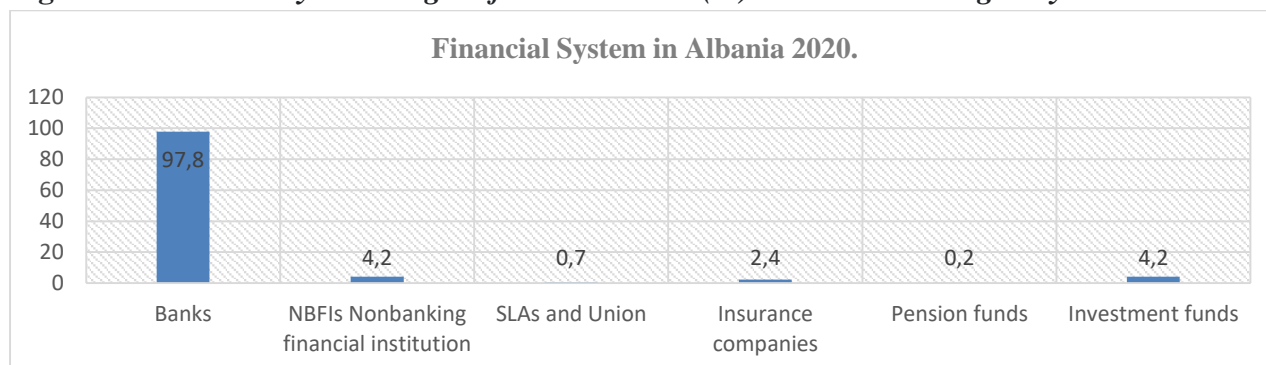


Source: Bank of Albania (2024).

The Banking Sector as a component of the Financial System during 2019, comprised 87.2% of the entire system. Compared to the previous year, 2018, the share of this sector, which includes Second Level Banks, has decreased by 1.6%. The sector in which they participate, Non-Bank Financial Institutions during 2019 comprised 3.9% of the entire Financial System. Compared to a year ago, this sector had a slight increase of 0.7%. The financial sector, which includes SLAS and Union during 2019, comprised 0.6% of the entire System. The financial sector in which Pension Funds are included during 2019 comprised 0.2% of the entire System. The financial sector, which includes Investment Funds, made up 4% of the entire system for 2019. These Institutions took the second place in terms of importance during 2019. Compared to 2018, the weight of this voice decreased by 0.2%.

Insurance companies made up 2% of this market during 2019. Compared to the previous year 2018, the sector in which Insurance Companies are a part expanded with a modest increase of 0.1%.

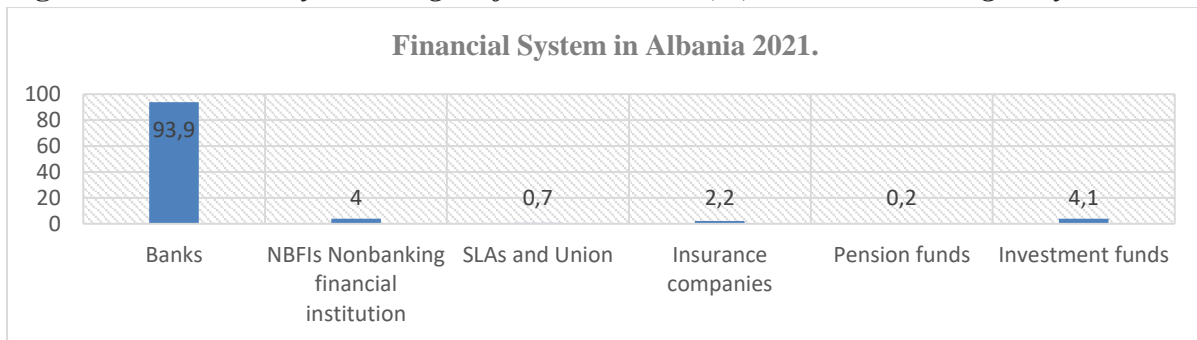
Figure 7: Financial System weight of assets to GDP (%) in Albania during the year 2020



Source: Bank of Albania (2024).

The financial sector in which they participate, the Banking Sector during 2020 comprised 97.8% of the entire Financial System in Albania. Compared to the previous year 2019, the specific weight of this sector has weighed a considerable increase of 10.6%. Non-Bank Financial Institutions, during 2020, comprised 4.2% of the entire Financial System. Compared to the previous year, 2019, this sector has grown by 0.3%. The Financial Sector in which SLAS and Union participate during 2020 comprised 0.7% of the entire System. Compared to 2019, this sector had a modest growth of 0.1%. The Financial Sector, which includes Investment Funds, during 2020, comprised 4.2% of the entire system. These Institutions occupied the second most important place during 2020. Compared to 2019, the weight of this financial sector increased by 0.2%. The financial sector in which they participate, insurance companies during 2020 comprised 2.4% of this system. Compared to a year ago, this financial sector expanded by a modest figure of 0.4%.

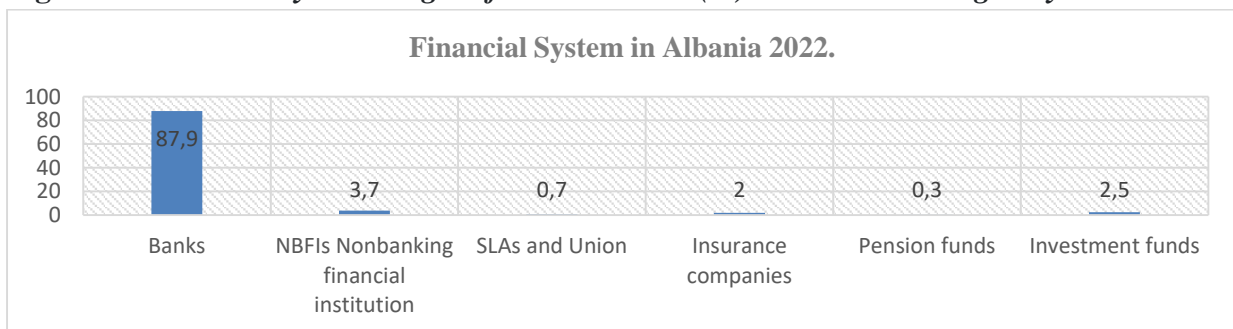
Figure 8: Financial System weight of assets to GDP (%) in Albania during the year 2021



Source: Bank of Albania (2024).

During 2021, the Banking Sector comprised 97.8% of the entire Financial System in Albania. Compared to 2020, the share of this sector has decreased by 3.9%. The Non-Bank Financial Institutions sector comprised 4% of the entire system during 2021. Compared to 2020, this sector has decreased by 0.2%. SLAS and Union and Pension Funds comprised 0.9% of the entire System. Investment Funds comprised 4.1% of the entire system for the year 2021. These Institutions occupied the second place in terms of importance during this year. Compared to the previous year, 2020, the weight of this voice decreased by 0.1%. Insurance companies comprised 2.2% of this market during 2021. Compared to the previous year 2020, this sector suffered a decrease of 0.2%.

Figure 9: Financial System weight of assets to GDP (%) in Albania during the year 2022



Source: Bank of Albania (2024).

*PROGRESS OF THE MICROFINANCE SECTOR IN ALBANIA, CURRENT CHALLENGES
AND THE PERSPECTIVE OF THIS SECTOR*

The Banking Sector in Albania during 2022 comprised 87.9% of the entire system. Compared to the previous year 2021, the weight of this sector, which includes Second Level Banks, has decreased by 9.9%. The financial sector, in which Non-Bank Financial Institutions participate, during 2022 comprised 3.7% of the entire Financial System. Compared to the previous year 2021, this sector has decreased by 0.3%. These Institutions occupied the second place in terms of importance during this year. The financial sector in which they participate, SLAS and Union, comprised 0.7% of the entire Financial System this year. The financial sector in which they participate, Investment Funds, during 2022 comprised 2.5% of the entire Financial System. Compared to 2021, the weight of this voice was reduced by 1.6%. Insurance companies made up 2% of this market during 2022. Compared to the previous year 2021, this sector suffered a decrease of 0.2%. Based on the Report published by the Financial Supervision Authority in Albania, it results that: The total number of loans granted by microfinance institutions in Albania during 2022 was 297,813 loans. Compared to the previous year 2021, this indicator has increased by 14.6%. (Association, Raporti i Mikrofinancave Shqiptare 2022) Based on these data, it can be seen that the main specific weight of lending by microfinance institutions is occupied by loans for individuals with a value of 274,999 loans, or in other words, this indicator is 15.8% higher than the previous year. The new lending made available to the business sector was narrowed during 2022. The value expressed in the figure of 15,717 loans, is 267 units or 1.6% less than in 2021. Loans for the sector involving farmers and agribusinesses increased by 1000 units or 18.5%, while the number of other loans decreased by 337 units or 32.4% compared to 2021.

DISCUSSIONS/CONCLUSIONS

The financial sector of Microfinance in our country has played an important role in the economic development of Albania. By offering financial resources to layers of the population, which usually have a hard time or are excluded from traditional banking systems.

The microfinance sector in Albania has faced challenges in liquidity management, especially in an uncertain economic environment. This has required careful management of financial resources. Microfinance institutions should focus on strong financial strategies to better manage liquidity and maintain their sustainability in uncertain economic times. Microfinance institutions have encountered challenges in complying with international regulations and standards, which are critical for integration into global markets (Ledgerwood, 2013). Sustainable strategies for compliance with these regulations must be developed, including staff training, as well as updating policies and procedures.

Digitization has offered opportunities for improving services, but it has also brought challenges, such as the need for investments in technology and staff training. Microfinance should invest in technology and focus on the digitization of their services, to improve their efficiency and effectiveness, as well as to expand the geographical reach of this sector, managing to better serve communities. Credit risk management strategies should be strengthened, including regular portfolio analysis and the implementation of corrective measures, when necessary. Microfinance has had a positive impact on socioeconomic development and the improvement of living conditions in local communities. Microfinance institutions should continue to invest in projects that have a positive socioeconomic and

environmental impact, helping to develop communities. Inclusion of marginalized groups and their empowerment through financial education should be a priority, building a culture of financial awareness throughout society.

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DIGITAL CULTURE AS A COMPETITIVE ADVANTAGE IN THE SUSTAINABLE DEVELOPMENT OF ORGANIZATIONS

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Abstract: *The article explores the concept of digital culture as a key component for organizations seeking sustainable development and competitive advantage in today's rapidly evolving business landscape. It delves into how embracing a digital culture within an organization can lead to enhanced efficiency, innovation, and overall performance. By fostering a culture that values digital skills, collaboration, and adaptability, companies are better equipped to navigate challenges and leverage opportunities in the digital age. There's no denying that there has been a noticeable increase in interest in recent years for solutions that support the sustainable development of organizations. In such a context, a key factor for increasing the efficiency of these processes is effective change management and its detailed knowledge. The management of human resources is affected by these management relationships, which guide it toward the strategic prioritizing of particular areas. However, given the evolving importance of technology and all of its associated aspects and activities, it is necessary to concentrate on identifying a new management paradigm, or digital culture. This is where we should also include the tendency, the primary driving force behind the changes, to be expressed in the understanding that increases in an organization's effectiveness have a direct connection to the human factor, and from there to innovative practices, talent management, motivational policies, and other aspects of personnel management. Therefore, in the search for sustainable development policies, human resources should be considered as organizational capital.*

Keywords: *sustainable development; digital culture; changes; human resources management.*

INTRODUCTION

In today's rapidly evolving business landscape, the quest for operational efficiency and sustainable growth is a top priority for organizations across industries. One key factor that plays a critical role in enhancing efficiency is effective change management and the profound understanding of its intricacies. The management of human resources is intricately intertwined with these dynamic change processes, steering it towards strategically prioritizing specific areas to drive organizational success.

However, amidst the ever-increasing significance of technology and its multifaceted aspects, there arises a pressing need to shift focus towards identifying a new management paradigm – one that encapsulates the essence of digital culture. This paradigm shift, which has unfolded over the past decade, resonates deeply within both the commercial and public service sectors, shaping their operational landscapes.

Consequently, in the pursuit of sustainable development frameworks, human resources emerge as invaluable organizational capital, propelling entities towards enduring growth and prosperity. The present study delves into these intricate relationships, offering unique perspectives on leveraging digital culture as a strategic advantage to bolster organizational effectiveness and pave the path towards sustainable growth.

The main research objective of the study is to explore the potential for Bulgarian organizations operating in the healthcare, education, hospitality and catering, finance, and insurance sectors to develop and foster a digital culture. This research aims to examine how building a digital culture within these organizations can lead to increased sustainability of their competitiveness and serve as a crucial competitive advantage in today's business environment.

I. DIGITAL CULTURE AS A COMPETITIVE ADVANTAGE

Investments are a key factor for the different phases of the economic cycle. It is really important they to be directed to innovative projects that provide high added value. For many companies from various sectors, digitalization is moving from a state of „nice to have“ to a „must have“ (Caldwel & Krishna, 2020). Companies are investing in digital transformation in order to be able to innovate faster, keep pace with technological and industry changes, and increase their resilience (Gurumurthy et al., 2021). Digital transformation should be a major pillar in the strategies of mature companies. “Digitalization is assessed as a factor contributing to the sustainable growth of business entities” (Akhundzada, N. & Rzayeva, 2023). Digitalization plays a crucial role in the sustainable growth of business entities by integrating digital technologies into various aspects of operations, enhancing efficiency, and promoting environmental responsibility. Digital tools streamline processes, reducing the time and resources needed to complete tasks. This can include automation of repetitive tasks, better resource management, and improved supply chain logistics. Digitalization enables better monitoring and management of energy usage and resource consumption.

Digital platforms facilitate better communication and collaboration among employees, partners, and customers. This can lead to more innovative solutions and faster problem-solving, driving sustainable growth. Access to real-time data and advanced analytics enables businesses to make informed decisions that enhance sustainability. Predictive analytics can forecast demand, optimize inventory, and reduce overproduction. Digital tools aid in designing and manufacturing products with sustainability in mind. Technologies like 3D printing allow for more efficient prototyping and production, minimizing material waste.

Digital channels provide businesses with new ways to engage with customers, gather feedback, and tailor offerings to meet customer needs. Satisfied customers are more likely to be loyal and contribute to long-term business success. Digital tools facilitate the tracking and reporting of sustainability metrics, enhancing transparency and accountability. This can improve a company's reputation and meet regulatory requirements. Embracing digital

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technologies can drive innovation, allowing businesses to stay competitive in a rapidly changing market. Sustainable innovation can open new markets and attract environmentally conscious consumers. Digitalization is a powerful enabler of sustainable growth for business entities. By leveraging digital technologies, businesses can improve efficiency, reduce environmental impact, and create long-term value for stakeholders.

Digital technologies (from email, file sharing, mobile phones, online gaming, ecommerce, GPS systems) are becoming commonplace and part of our social and personal lives (Broeckman & Jaimes, 2015). Organizational culture refers to the collective beliefs, values, attitudes, and behaviors that shape the way individuals within an organization interact and work together. Organizational culture plays a significant role in shaping employee behavior, decision-making processes, communication styles, and the overall performance of the organization. Digital culture is an expression of norms, values and expected ways of going things due to ever-increasing computerization and digitalization of society (Deuze, 2006, p. 65). A positive organizational culture can foster collaboration, innovation, and employee satisfaction, while a negative culture can lead to conflicts, low morale, and decreased productivity. Cultivating a strong and healthy organizational culture is essential for creating a positive work environment and achieving organizational success. Digital culture encompasses the various ways in which individuals interact with digital media and technologies on a day-to-day basis (Sadiku et al., 2017).

I.1. Digital culture of organizations

Digital culture, which includes values, norms, and practices related to technology and digitization, usually stems from external trends and influences such as technological developments, industry trends, and consumer behavior (Junaedi et al., 2024, p. 455). Cultural characteristics include perceptions and attitudes about the organization's operations, risk-taking and innovation, awareness and public presence (Hadjitchoneva, 2022, p. 56). Digital culture for organizations refers to the collective mindset, behaviors, and practices that prioritize the integration of digital technologies and tools into every aspect of the business.

The digital culture that develops in the external environment can have a major impact on company performance (Junaedi et al., 2024, p. 455). Digital culture encourages innovation by fostering a mindset of continuous improvement and experimentation. It promotes the idea that new technologies and approaches can drive business growth and success.

Organizational culture refers to a set of shared values and beliefs that guide individuals in understanding how the organization operates and establish norms of behavior within the company (Arefin et al., 2015). Organizations with a strong digital culture are adaptable and flexible in the face of change. They embrace new technologies and ways of working to stay relevant and competitive in a rapidly evolving digital landscape. Companies that are able to adopt a digital culture that suits their external environment and integrate it with their operations and business strategy can gain a competitive advantage (Junaedi et al., 2024, p. 455).

Measurement of digital culture uses the dimensions of organizational culture (Arefin et al., 2015), digital transformation (Nguyen & Hoai, 2022), human capabilities, and innovation capabilities as a novelty. A digital culture places a strong focus on understanding

and meeting customer needs effectively. By using digital technologies to gather customer insights and personalize interactions, organizations can deliver better customer experiences and build long-lasting relationships.

Digital culture refers to mindsets, behaviors, and practices related to the use of digital technology in everyday life (Junaedi et al., 2024, p. 456). This culture promotes a data-driven approach to decision-making. Organizations leverage data analytics and insights to make informed decisions, optimize processes, and drive business outcomes.

The leading challenge faced by global management of human resources is the motivation of people to get involved with desire and curiosity in this new stage of human development. (Vasilev & Ognianski, 2020, p.91). Overall, digital culture empowers organizations to harness the potential of technology to drive growth, improve efficiency, and create value for stakeholders. By embracing a digital culture, organizations can stay ahead of the curve and thrive in today's increasingly digital world.

Digital culture values employee empowerment, learning, and development. It encourages employees to embrace digital tools, upskill themselves, and contribute to the organization's digital transformation efforts. This culture reflects the social transformation brought about by advances in information and communication technology, especially the internet and mobile devices (Junaedi et al., 2024, p. 456). Overall, digital culture empowers organizations to harness the potential of technology to drive growth, improve efficiency, and create value for stakeholders. By embracing a digital culture, organizations can stay ahead of the curve and thrive in today's increasingly digital world.

Digitalization is a phenomenon that binds all things through technological innovations that cover the processes and phenomena (Hadjieva, 2021, p. 139). Digitalization and digital transformation have a variety of definitions and dimensions. Gartner (2018) defines digitalization as „the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business”.

Digital culture values employee empowerment, learning, and development. It encourages employees to embrace digital tools, upskill themselves, and contribute to the organization's digital transformation efforts. This culture reflects the social transformation brought about by advances in information and communication technology, especially the internet and mobile devices (Junaedi et al., 2024, p. 456). The areas in which enterprises benefit from participation in digital transformation are as follows: innovativeness, efficiency and process optimization, access to a wider market and et.

The effects of digitization are visible not only at the level of processes, but also management. As a company wants to benefit from digital transformation, it must first diagnose which areas have the potential for implementing new solutions. Digitization, which involves transforming analog data into digital datasets, represents the utilization of digital resources (Astuti & Augustine, 2022).

Entering modern technologies is a strategic decision that must result from far-reaching plans for production planning, but also the choice of markets, customer segments, sales policies, logistics partners and distribution networks. There is potential for change in all of these areas, but decisions must be well- thought-out, and in particular, comprehensive and integrated, embracing the company's overall policy, in pursuit of the strategic vision.

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Digital culture refers to the attitudes, behaviors, beliefs, and practices that shape how individuals, organizations, and societies interact with and adapt to digital technologies. Digital culture also includes the values and norms that guide how people engage with digital tools, platforms, and content. Overall, digital culture reflects the evolving relationship between people and technology in an increasingly connected and technology-driven world.

I.2. Competitive advantages for the sustainable development

There is an ongoing debate about the „entity” of competitiveness (Shafaei, 2009). Competitiveness as an economic category represents the ability and performance of a firm, sub-sector or country to sell and supply goods and services in a given market, in relation to the ability and performance of other firms, sub-sectors or countries in the same market.

Research methods can be descriptive research, exploratory research and or explanatory research (Sakyi et al., 2020). Competitiveness can be captured and measured by several aspects at micro, mezzo, and macro levels (Balogh & Jambor, 2017, p. 2076). L. Hardy, I. M. Lifits and others are proponents of traditional methods of assessing competitiveness based on the quality of production (Woodman & Hardy, 2003). However, these methods should be combined with others to achieve a more accurate assessment of the competitiveness of an enterprise.

To date, various methods have been employed to investigate the theory of comparative advantage, and they provide the basis for this analysis (Balogh & Jambor, 2017, p. 2078). Competitive advantages provide organizations with a unique edge over their competitors, enabling them to outperform rivals and achieve sustainable success in the marketplace.

Competitive advantages allow organizations to differentiate themselves from competitors by offering unique products, services, or value propositions. This differentiation can help attract customers who are looking for something distinctive and valuable. Both CSR and Sustainability address the responsible and sustainable use of resources while considering social, ecological, and economic dimensions of business practice. To increase sustainability and satisfy the demand for energy, countries should develop and utilize renewable resources as well as efficiently use energy sources (Gigauri & Vasilev, 2022, p. 267).

By leveraging competitive advantages, organizations can capture a larger share of the market. They can win over customers from competitors and expand their customer base, driving growth and profitability. Organizations with competitive advantages can build strong relationships with customers based on trust, quality, and reliability. This leads to increased customer loyalty and repeat business, reducing the risk of losing customers to competitors.

Competitive advantages enable organizations to charge premium prices for their products or services, leading to higher profit margins. They can also operate more efficiently and effectively, reducing costs and improving overall profitability. Having competitive advantages fosters a culture of innovation within organizations. They are encouraged to continuously improve products, processes, and services to maintain their edge over competitors and stay ahead of market trends. Strong competitive advantages create barriers to entry for new competitors trying to enter the market. This protects organizations from potential threats and gives them a more secure position in the industry. Overall, competitive

advantages benefit organizations by helping them stand out in the market, attract and retain customers, drive growth and profitability, foster innovation, and protect their market position from competitors. By leveraging their competitive advantages effectively, organizations can achieve long-term success and sustainability in today's competitive business environment.

Figure 1

Digital culture as a competitive advantage



Source: author's systematization

Competitive advantage refers to the advantage gained by a company that surpasses its competitors within the same industry. This advantage is achieved through the implementation of innovative ideas that allow the company to provide high-quality goods or services, competitive pricing, and ultimately increase shareholder wealth. Sustainable competitive advantage can be applied to a company, country, or individual. Cost advantage, differentiation advantage, and comparative advantage are the three main types of competitive advantage. Competitive advantage enables an organization to create greater value for itself and its shareholders rapidly. By outperforming competitors, a company can secure a stronger market position, increase market share, and enhance profitability, leading to long-term success.

Achieving a sustainable competitive advantage, applicable to companies, countries, or individuals, involves leveraging cost advantage, differentiation advantage, and comparative advantage. This strategic edge enables organizations to create significant value for themselves and their shareholders, securing a stronger market position, increasing market share, and enhancing profitability, ultimately leading to long-term success.

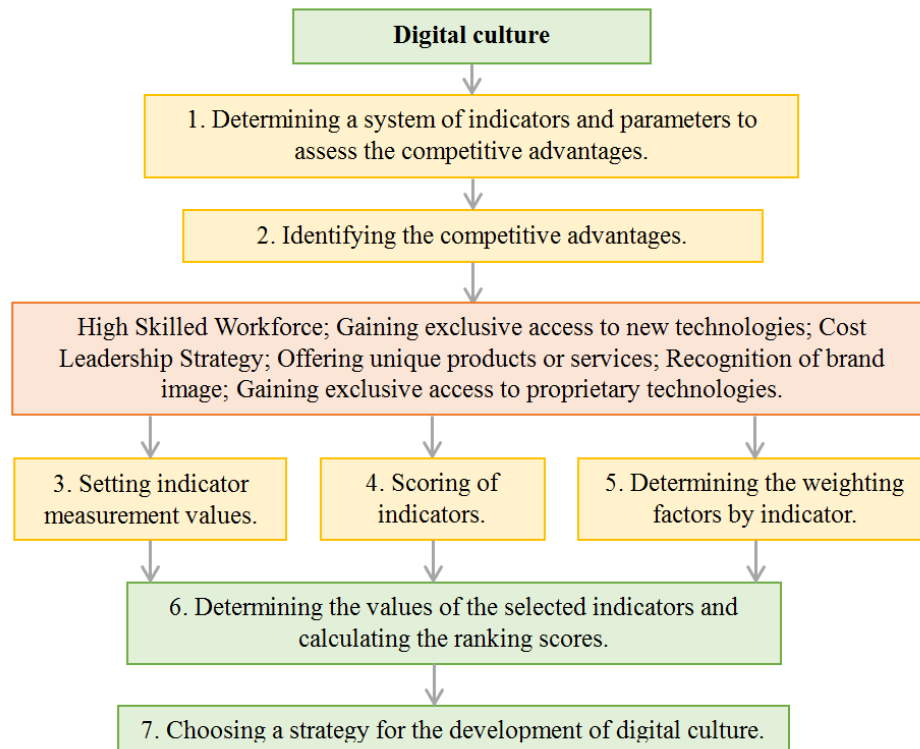
II. METHODOLOGY

The methodology clarifies the main stages for assessing the digital culture as a competitive advantage and aims to reveal its reserves, as well as to formulate guidelines for its future development.

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Figure 2

Stages for determining the competitive potential through digital culture



Source: author's systematization

It can be seen from Figure 1 that after determining the values of the selected indicators and calculating the ranking scores, the overall competitiveness score is calculated, the competitive advantages are identified and it is proceeded to the selection of a strategy for the development of digital culture.

Weighting factors can be determined: by expert judgment; by studying the opinions of the managers surveyed; or as a result of empirical research. The summative assessment of the competitive potential is determined as the sum of the scores by individual indicators weighted by factors of significance. The key stages for assessing digital culture as a competitive advantage are generally the following: gathering the information needed to assess a competitive advantage; determining indicator and indicator values; scoring the indicators; determining weighting factors; and assessing indicator values.

In cases where the competitive potential to increase the competitiveness is assessed, the following formula is applied to determine its relative position to another (Velev, 2004, p. 105):

$$BO_{ik} = 6x \frac{(ST_{ik} - ST_{imin})}{(ST_{imax} - ST_{imin})} + 1 \quad (1)$$

where: BO_{ik} – score of the i -th indicator for the k -th producer;

ST_{ik} – the value of the i -th indicator for the k -th enterprise;

ST_{imax} and ST_{imin} – the maximum and respectively the minimum amount (value) of the i -th indicator for the entire aggregate of analysed producer.

The main research thesis is to study the possibilities of Bulgarian organizations in the field of healthcare, education, hospitality and catering, finance and insurance, to build a digital culture to increase the sustainability of their competitiveness and as an important competitive advantage.

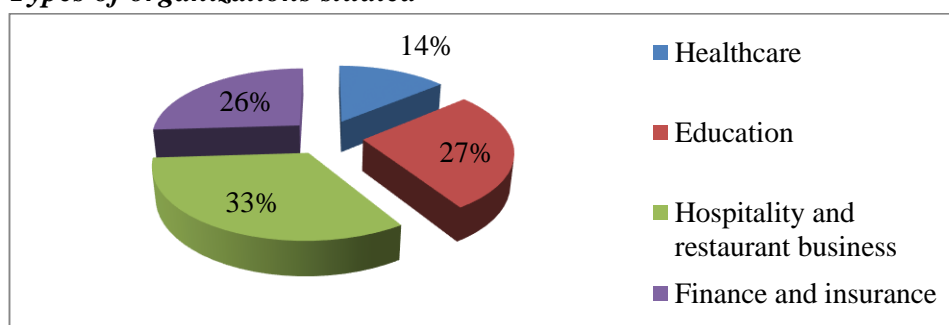
118 Bulgarian companies from the fields of healthcare, education, hospitality and catering, finance and insurance were studied. Half of the companies are from the Southwest region. The survey was conducted in the period November 2023 - March 2024. The questionnaire consists of 25 questions, divided into 4 main subtopics: general characteristics; the relationship between digital culture and leadership in the company; investing in individual and company knowledge and innovation; and the sustainable competitiveness of the company.

The research object is the digital culture within Bulgarian organizations in the fields of healthcare, education, hospitality and catering, finance, and insurance. The research subject is the potential for building a digital culture in these Bulgarian organizations to enhance the sustainability of their competitiveness, examining how digital culture can serve as an important competitive advantage. This analysis focused on identifying the existing digital practices and the potential for cultivating a robust digital culture within these sectors. The selected companies were evaluated on various dimensions, including leadership's role in promoting digital initiatives, the extent of investment in digital tools and training, and the overall impact of these practices on organizational performance and market positioning. This detailed investigation provided valuable insights into the current state and future possibilities of digital transformation in the Bulgarian context.

The survey was conducted mainly among four types of organizations in different fields, such as healthcare (14%), education (27%), hospitality and restaurant business (33%) and finance and insurance (26%).

Figure 3

Types of organizations studied



Source: author's systematization

To an extremely large extent, the researched organizations for micro- (23%), small (37%) and medium-sized enterprises (36%), and only 4% are the large organizations that took part in the research. In relation to the market in which activity have been carried out, 65% are national organizations, 26% operate in the regional market and only 9% operate in the international market. A vast part of the investigated organizations have a duration of work between 10 and 25 years (51%), with a duration of 25 years there are 26% and relatively fewer organizations with a duration of work under 2 years (only 3%) and between 2 and 9 years (20%).

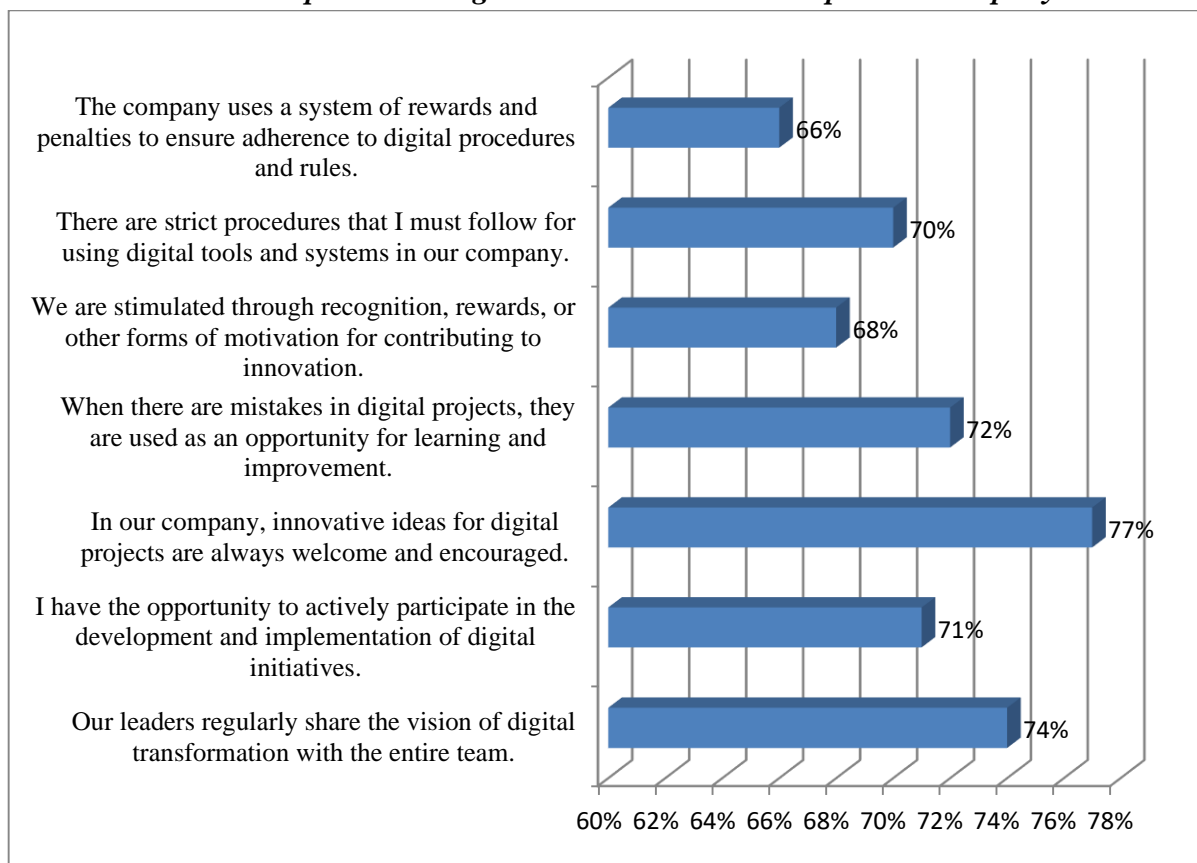
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III. RESULTS

In order to establish the relationship between digital culture and leadership in organizations, specific questions have been asked. It is noteworthy that a large part of the surveyed individuals (74%) answered that regularly share the leader's vision for digital transformation with the entire team in the organization, i.e. managers often discuss with their employees the possibilities for development in the direction of digitalization in certain activities of the organizations.

Figure 4

The relationship between digital culture and leadership in the company



Source: author's systematization

Approximately 71% of the surveyed individuals have the opportunity to participate actively in the development and implementation of digital initiatives, which means that the leaders in most of the investigated companies are aware of how important the staff is as being part of the implementation of innovations. Companies are beginning to try to react quickly and undertake strategies to anticipate or adapt to digital changes and to implement digital transformations (Genov & Hadjichoneva, 2021) to upgrade their operating models and improve outdated ways of working and cumbersome processes. New businesses are emerging that are „digital native“ (Prensky, 2001; Perkin & Abraham, 2017), distinguished by speed of reaction, focus and flexibility to changes in the business environment.

The results of the conducted research also show that innovative ideas for digital projects are encouraged extremely often, and when there is a mistake during the process, it is used as

an opportunity to learn and improve. In this regard, the business's ability to intelligently use internal and external information resources becomes its new competitive advantage, in order to ensure greater user satisfaction.

Referring to processes of implementing innovations, employee motivation is undoubtedly important, and very often companies encourage staff through recognition, awards or other forms of motivation for contributing to innovation. The company uses a system of rewards and penalties to ensure adherence to digital procedures and rules. Innovations are largely effective when strict procedures are followed for using digital tools and systems. The work with digital tools is subject to regular monitoring and evaluation by superiors.

To a significant extent, organizations in Bulgaria are aware that investing in individual and company knowledge and innovation is a key factor for success. In this regard, more than 75% of respondents have seen serious investments in the development of employees' digital skills, such as the use of collaborative platforms, smartphones, online communications with customers, use of company software and data analysis. Many companies invest in company knowledge to improve business processes, such as enhanced web presence, CRM for customer relationship management, ERP for business function management, e-commerce, digital marketing tools - social networks, email marketing, SEO, PPC, and others.

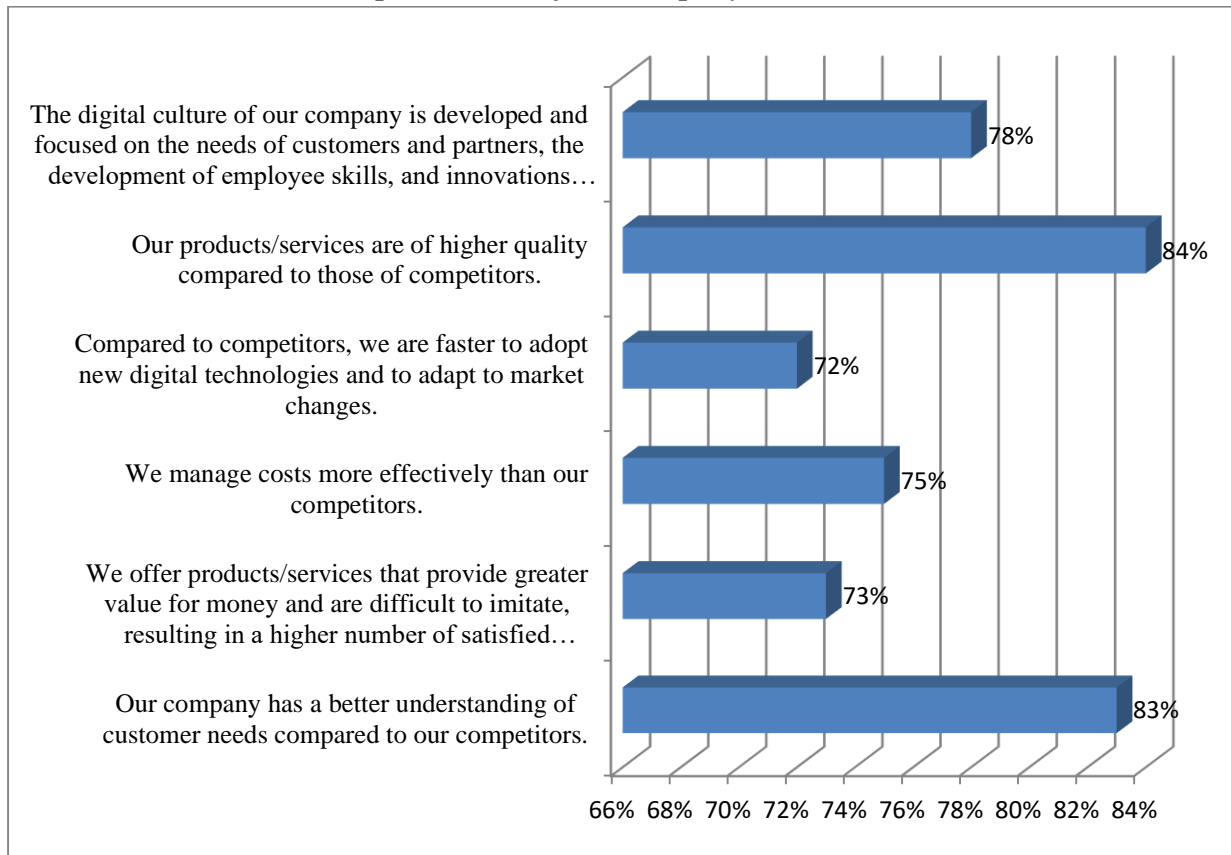
However, not all companies have the opportunity to balance investments between the development of company knowledge and the individual knowledge and skills of employees. To a considerable extent, Bulgarian organizations direct their investments to innovations in products and services, in marketing and business models. In terms of sustainable competitiveness, most companies seek to understand their customers' needs to a greater extent than their competitors. In this way, they could respond more precisely and quickly to the needs of users. (Stefanova et al., 2023).

Nowadays companies aspire to offer products and services that provide greater value for money or are difficult to imitate, resulting in a greater number of satisfied customers compared to competitors. Effective cost management is also a competitive advantage. Other competitive advantages that modern Bulgarian companies strive for is to adopt new digital technologies more quickly and to adapt themselves to market changes.

Embracing new digital technologies and staying agile in response to market changes are crucial for modern Bulgarian companies to remain competitive. By being quick to adopt innovative technologies, businesses can streamline operations, enhance efficiency, improve customer experiences, and gain a competitive edge. Additionally, the ability to adapt rapidly to changing market dynamics allows companies to seize new opportunities, address emerging challenges, and stay ahead of the competition. Overall, a proactive approach to digital transformation and market responsiveness can help Bulgarian companies thrive in today's fast-paced business environment.

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Figure 5
The sustainable competitiveness of the company



Source: author's systematization

Offering high quality products and services is also a key factor and an important competitive advantage. Competitive advantage in business is not something that can be vested. Rather it can only be earned through the hard work, dedication, and ethical performance of an organization. It does not come easy, and an organization might need to dedicate years and sometimes decades to earning this advantage over its arch rivals belonging to the same industry. The key to earning it is excellent and ethical performance, and one cannot earn the same through degrading or defaming rival companies operating in the same domain.

CONCLUSIONS

Sustainable competitive advantage can be applied to a company, country, or individual. It is mainly of three types- comparative advantage, cost advantage, and differentiation advantage. The strategies with which an organization can earn are: information advantage; cost leadership strategy; adaptability; differentiation strategy; operational effectiveness strategy; technology-based competitive advantage; and innovative strategy.

In conclusion, this study underscores the paramount importance of digital culture as a transformative force that holds the key to enhancing firm performance in today's dynamic business environment. The findings highlight that digital culture not only significantly boosts firm performance but also acts as a vital moderator in amplifying the impact on organizational

success. Remarkably, it is evident that digital culture exerts the most potent influence on firm performance, reshaping the operational landscape of organizations.

From a practical standpoint embracing digital culture as a competitive advantage emerges as a strategic imperative for organizations seeking to elevate their performance levels. By harnessing the power of digital culture, firms can drive improvements in performance through direct influence as well as through fruitful interactions across various facets of their operations. This underscores the pivotal role that digital culture plays in propelling firms towards sustained success and growth in an increasingly digitized world. The insights generated by this study serve as a clarion call for organizations to prioritize the cultivation of a robust digital culture to unlock their full potential and thrive in the digital age.

The article presents an important perspective on the role of digital culture in shaping organizational success and sustainability. Researching provides insights into how organizations can leverage digital technologies and a digital mindset to drive innovation, efficiency, and growth. The focus on sustainable development underscores the long-term benefits of nurturing a digital culture that promotes resilience and adaptability.

Organizations can use the results of this article to assess their current digital culture and identify areas for improvement. Implementing strategies to enhance digital literacy, foster a collaborative work environment, and embrace digital transformation can lead to tangible business outcomes and sustainable growth. By aligning digital culture with organizational goals and values, companies can better position themselves for success in a competitive marketplace. The survey methodology used have limitations in terms of sample size and representativeness. The study not capture the full complexity of digital culture within different types of organizations and industries.

Overall, the article on digital culture as a competitive advantage in sustainable development provides a valuable starting point for further research and practical application in the field. Conducting longitudinal studies to track the impact of digital culture on organizational performance over time could yield valuable insights.

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NOTHING NEW IN MARKETING COMMUNICATION OF E-CIGARETTES – THE NEW WAVE OF FAKE NEWS

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Abstract: *The tobacco industry is using the same methods of persuasion as they were doing since the start of advertising cigarettes and other tobacco products in 1914. Producers of tobacco products have been accused of spreading misinformation and fake news since the 1980. Main objective of our paper is to describe the evolution of “fake” marketing communication, especially of e-cigarettes - lately the deceptive strategies of e-tobacco companies in their advertising campaigns, where they minimize the dangers of smoking and portray it as a beneficial or attractive practice are coming under the control of the relevant institutions. Since the e-tobacco companies are using all the modern means and platforms of communication, especially young generations are quite successfully targeted. Results of desk research will be presented as well as some of the activities performed by state owned, and private institutions aimed to prevent harmful and shameless spreading of this conflicting information.*

Keywords: *fake news, e-cigarettes, desk research.*

INTRODUCTION

This paper is partly based on a previous piece from 2018 where effect of fake news in marketing (communication) was illustrated using two examples: content of iron in spinach and danger of smoking (Sila, 2018). Since e-cigarettes of different styles and shapes evolved in these years, we decided to broaden our research into this area.

The goal of this paper is to describe the marketing (communication) tools, approaches, and perfidious ways of persuasion that made people believe smoking (e-cigarettes) is a good and even healthy decision. Or, since e-cigarettes tend to be more advanced, they “allow individuals to enjoy nicotine or flavored vapes at their own discretion.

While there is still some stigma attached to vaping, it is becoming more widely accepted, and the devices are certainly safer than when they first appeared on the market decades ago« (IndeJuice, 2024).

It is estimated that 1.1 billion people on the planet are smoking (Healthdata, 2021). 90% of new smokers start smoking in the age between 15 and 24.

The ten countries with the largest number of tobacco smokers in 2019, together comprising nearly two-thirds of the global tobacco smoking population, are China, India, Indonesia, the USA, Russia, Bangladesh, Japan, Turkey, Vietnam, and the Philippines – one in three current tobacco smokers (341 million) live in China. (Healthdata, 2021).

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Additionally, Tobacco kills more than 50% of regular smokers, 6 million a year (plus more than 884.000 secondhand smokers) and has a two trillion-dollar economic cost to society each year (Martin, 2018; Smith, 2018; Tobacco 2018). E-cigarettes are electronic devices which belong to an enlarging number of electronic nicotine delivery systems (ENDS) that mimic tobacco smoking without combustion of tobacco (Bhatt, Ramphul and Bush, 2020).

The first patent introducing electronic cigarette was granted as early as in 1930 to Joseph Robinson. Nevertheless, »It was never commercialized, and it is not entirely clear that even a prototype of this primitive device was manufactured« (History of Vaping 2022). There were a lot of unsuccessful attempts of developing and producing e-cigarettes until 2003 when a Chinese pharmacist Hon Lik produces »the first modern e-cigarette«. His father died from lung cancer and he »sought to create a device that would more deliver nicotine in a less harmful manner than cigarettes« (IndeJuice, 2024). In April 2006 electronic cigarettes were first introduced in Europe and in August 2006 to the United States. (History of Vaping, 2022)

»In March 2009, the e-cigarette business hit a roadblock with the FDA. The government agency released Import Alert 66-41, effectively banning all imports of E-cigarettes, citing they were not FDA-approved drug delivery devices«. Soon, Canada and Hong Kong banned e-cigarettes. The FDA continued to claim all kinds of e-cigarettes were drug delivery systems and required advanced approval from the FDA (IndeJuice, 2024). The share of e-cigarettes in February 2024 in a selection of countries was (Bashir, 2024):

- Indonesia: 32%
- India: 28%
- Brazil: Approximately 25%
- Russia: Around 23%
- United States: Approximately 20%

Fake news

Fake news is “false, often sensational, information disseminated under the guise of news reporting” (Collins, 2017). Fake news was selected the word of the year by Collins Dictionary.

Usually, fake news relates to media, public relations, or similar activities. In our article we want to explain how fake news is diligently and quite successfully used by manufacturers of e-tobacco products (hereafter e-cigarettes). Big and important advertisers have been communicating several facts that later proved to be false – they were often excused as *alternative facts*. Tobacco industry used all of tools you can imagine avoiding telling the truth (Sila, 2018) – this contains all of characteristics that can be attributed to fake news - their successors are no less ingenious in this respect.

The Internet as a platform and ubiquitous, especially mobile broadband with smartphones as equipment have opened a new dimension in the topic of fake news. Due to the number of messages, the superficiality, and the speed of the user (and the slightly smaller screen on the mobile device), if you are not careful enough - who is the source of your information -, you can be easily misled. Even the largest and most respected media were once owned, controlled or economically dependent on the tobacco industry (Sila, 2018) which is still happening in one way or another today.

Research objectives

In our paper, three objectives were meant to be achieved: firstly, whether the communication practices employed by e-tobacco companies exhibit attributes akin to those of fake news; then, whether these strategies bear semblance to historically recognized modes of deceptive communication; and finally, do modern institutions that are supposed to take care of the protection (health) of consumers take appropriate actions and regulate this domain?

METHOD

The present research continues our work from 2018, but since it is a subject that is of particular interest to us due to its controversy, it is constantly monitored. The desk research was carried out from January, especially in March and April 2024.

A huge number of different online and offline sources were reviewed, both those favoring the production and consumption of e-cigarettes and those against - especially the websites of public and private "concerned" initiatives and scientific institutions (such as Stanford University). The practice of some European self-regulatory advertising institutions, the European Commission and the Slovenian Advertising Chamber was also reviewed.

RESULTS

As Stevens et.al. (2020) found out in their research, e-cigarette advertising was minimally regulated and therefore meant an important factor for increasing e-cigarette use among younger customers. Smoking conventional cigarettes is still declining among youth and young adults, in contrast to e-cigarette smoking, which is increasing.

Advertising Themes

There are a lot of different ways how to advertise e-smoking. Researchers at Stanford University - SRITA (Stanford Research Into the Impact of Tobacco Advertising) organized e-cigarette advertising themes into 28 collections, of which we will focus on some, in our opinion, the most interesting in our paper:

Table 1

Examples of selected adverting themes

Theme	Brand	Main Message
Freedom	Blu Victory	Take back your freedom No Limitations No Tar No Odor
Healthier, Health giving	Blu Shenzhen Tobeco Technology	More Doctors Vape than use traditional cigarettes! NO second-hand smoke, NO unpleasant smell, NO fire, NO ash
Helps You Quit	Quitters LMAE	Let Smokeless Delite be Your Last Cigarette (Lifetime Warranty, 30-day Money-Back Guarantee) Why Quit? Just Switch! Try Now!
Smart, Pure & Fresh	Veppo Novus	Weak People Smoke, Strong People Smoke Less, Intelligent People Vape Inspired By Science. The harmonic balance of science and nature provides inspiration for the

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		development of an Integrative solution such as Novus
(Sweet) Flavors	Vapor Wise Vest Shore Vapes	Milk Chocolate: Inhale Flavor, Curb Cravings, Lose Weight Try Our New Red White&Blue e-juice. It's The Bomb!
Woman Targeting	Wink Vape Goddess Eversmoke	Let'em, know you 're Single? 0 mg Guilty Pleasure (Cookies & Milk) Save a Life. Save a Lung. Save a Boob
Sex Sells	Weston Blu	I've got some bad habits but smoking isn't one of them. Slim. Charged. Ready to Go
Eco-Friendly	Logic Smoke Green Smoke	It's Simple. (Send us 10 disposable LOGIC e-cigs, and we'll send you 1 new disposable e-cig for free) Tastes Real... Feels Real... It's NOT a Cigarette. It's electric
e-cig Designs	NJOY Antonio Villard	The most amazing thing about this cigarette? It isn't one. All of the good, none of the bad
Tobacco Owned Brands	E-Lites Vuse	The Satisfying smoking alternative (UK's best electronic cigarette) Welcome to tomorrow. A perfect puff. First time, every time

Source: SRITA (n.d.)

Regulation of (e-)cigarette marketing

Slovenia

In Slovenia, the legal regulation of e-cigarettes is governed by the Act on Restrictions on the Use of Tobacco and Related Products (ZOUTPI), which entered into force in 2017. This act sets the following restrictions on e-cigarettes (NIJZ, n.d.-a; Uradni list, 2017):

- Prohibition on the sale of e-cigarettes to minors (under 18).
- Prohibition of remote sales of e-cigarettes (via the Internet or telephone).
- Prohibition of advertising, promotion, and sponsorship of e-cigarettes.
- Ban on the use of e-cigarettes in closed public places and workplaces, except in specially designated smoking areas.
- Mandatory warnings about health risks on the packaging of e-cigarettes and liquids with nicotine.
- Limiting the maximum nicotine content in e-cigarette liquids to 20 mg/ml.
- Limiting the maximum volume of containers for e-cigarette liquids to 10 ml.
- Limiting the maximum volume of containers for filling e-cigarettes to 2 ml.

Europe

The marketing communication of e-cigarettes in EU countries is regulated by Article 20 of the Tobacco Products Directive (2014/40/EU), which lays down rules for electronic cigarettes sold

as consumer products in the EU. According to this article, e-cigarettes must comply with safety and quality requirements (i. e. a maximum nicotine concentration and volume, child-resistant and tamper-evident packaging, and a mechanism for refilling without spillage). You can't enter the new market with e-cigarettes without notification of regulatory institution in the country. You must provide information on the ingredients, nicotine content, and harmful effects of the products. Moreover, e-cigarettes must carry health warnings advising consumers that they contain nicotine and should not be used by non-smokers, and a leaflet with instructions for use and additional information. Any promotional elements on e-cigarette packaging are prohibited, and any cross-border advertising and promotion of e-cigarettes in the EU as well. The article also requires manufacturers, importers, EU countries, and the Commission to monitor and report on the developments related to e-cigarettes, such as market trends, preferences of various consumer groups, and health effects. The Commission has adopted implementing acts and reports to facilitate the implementation of Article 20 of the Directive. (Public Health, n.d.-a)

Questionable communication practices

Manufacturers and sellers of e-cigarettes use many tricks in their marketing and sales activities, below we will list only some of them (K., 2023; R., 2020; Bandur, Pust, Jaklič, 2019; tobaccofreekids, n.d.)

Misleading consumers about the safety and health effects of e-cigarettes

E-cigarettes are said to be safer and less harmful than regular cigarettes, although there is insufficient evidence to support this. In addition, some ignore warnings about potential risks such as nicotine addiction, lung and heart damage, and exposure to aerosols and toxic chemicals.

While the American media is still following young people who have recently been affected by an unknown lung disease, which, according to doctors, is most likely related to smoking electronic cigarettes or vaping, it is also noted in Slovenia that the use of such cigarettes is quite widespread in primary and secondary schools. In a survey conducted by NIJZ (Nacionalni inštitut za javno zdravje - Nacionalni inštitut za javno zdravje (National institute of public health) in 2018, school workers reported its use in 43 percent of participating schools from Slovenia.

The mysterious lung disease, as it was called in the American media, including the Washington Post and the New York Times, reportedly affected about a hundred people. Although it is not yet known what caused it, it can be linked to electronic cigarettes or to the ingredients that people inhale while vaping. Nor is there sufficient evidence that an infectious disease is to blame for their condition. Since patients do not respond to antibiotics, doctors suspect that the cause of their discomfort is a toxic ingredient.

Targeting young and vulnerable groups using attractive and trendy elements.

Nicotine is a highly addictive substance and can greatly affect the development of the adolescent brain. In particular, it can damage the parts of the brain responsible for attention, memory and learning. If someone consumes nicotine at a young age, the likelihood of future addiction to other drugs increases. Thus, some advertisers use colorful and tasty aromas, fashion designs, celebrities, music, and humor in their messages to attract young people (and other vulnerable groups). They are less critical, less experienced, and more susceptible to the influence of advertising.

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Exploiting legal loopholes and lack of regulation

Entrepreneurs are always looking for opportunities to avoid excessive restrictions. Manufacturers of (e)cigarettes are real masters at this, they cleverly take advantage of the fact that in most countries e-cigarettes are not subject to the same legal restrictions as regular cigarettes. For example, some advertise e-cigarettes on television, radio, the Internet, and other media where advertising of regular cigarettes is prohibited. Social networks and certain events are also an excellent opportunity to spread recognition and your own truth. Also, some do not respect age restrictions or the ban on smoking in public places.

Advertising of e-cigarettes as a smoking cessation aid

It is often easy to understand from advertisements that e-cigarettes are an effective way to quit smoking regular cigarettes, although there is no scientific evidence for this. But we do know that e-cigarettes can increase nicotine addiction and make the process of quitting smoking more difficult. In addition, e-cigarettes may encourage substantial use—along with regular cigarettes—increasing the effects of exposure to tobacco smoke and other harmful substances.

Corruption of academic research

JUUL bought an entire May/June 2021 edition of the American Journal of Health Behavior (for 51,000 USD). That means they can control the proof that JUUL's products are safe. 11 studies were written by 26 co-authors, of which 18 were employed by or had strong connections with JUUL.

Most of the articles were influenced by JUUL, which claims that e-cigarettes help dissuade smokers from combustible tobacco products and thus help public health. Virtually nowhere in these articles can we find information that Juul and similar vaping companies make money by getting new smokers addicted to nicotine. But what can the quality of research even be if all the results come from the same corporate source (Juul e-cigarettes, n.d.)

DISCUSSIONS

In the continuation, we describe selected examples of advertising topics, examples of limitations and restrictions of marketing communication and other examples of marketing activities in more detail.

In the previous chapter, the reader could already find many characteristics that can be attributed to fake news, and below, these descriptions additionally confirm our claims.

Comment on advertising topics

Freedom

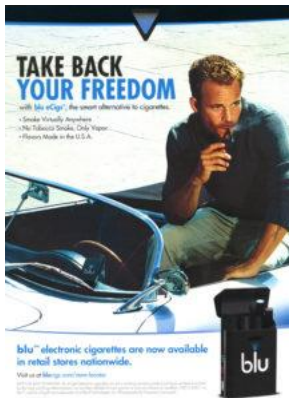
Freedom marketing is very powerful, since free style can also mean freedom to smoke anywhere – without worrying too much about smoking restrictions.

E-cig brands market freedom-based messages both through traditional advertising in magazines and billboards and through direct consumer interactions through social media channels. Blu Cigs frequently posts on its Facebook page with images associated with a free lifestyle and with posts asking followers to comment on their own “freedom stories.” (Daddis, 2011, in SRITA, n.d.).

Freedom and rebellion-based communication messages are aimed primarily at a younger population that is less critical of advertising messages (SRITA, n.d.).

Picture 1

Blu: Take back your freedom



Source: SRITA (n.d.)

Health

In the 1950s, tobacco company advertisements often featured doctors selling cigarettes or cigars. Doctors have always been idealized. Consumers who saw these ads felt that they had to follow the doctor's instructions - after all, doctors represent the authority in the field of health.

It is unlikely that such an advertising strategy would be tried in the 21st century. This is exactly what is happening in the electronic cigarette industry - not only is it newer, it is also less understood and the consequences of e-smoking are less studied. E-cigarette brands such as Vapestick, Vape Doctor and Love are resorting to the old and familiar tactic of using the image of a "trustworthy" doctor to sell their products. In a more obvious push for the product by the online retailer, we see two surgeons in an operating theater laughing (!) at a patient who we understand is being treated for a tobacco-related illness. The headline of the ad reads: "Still smoking tobacco cigarettes?" The rest of the text reads: "Haven't you heard of e-cigarettes?"

Electronic cigarette companies distance themselves from the risk of lung cancer in their advertisements by stating that their product does not contain carcinogenic substances (Green Smoke, Cleurette, Headlines, e-cigLife) or "No cancer substances" (eHealth-Cigarette). The Steamz brand even states that their cartomizers are "non-cancer" and "90% safer than traditional cigarettes" (SRITA n.d.).

To date, not enough research has been done on the health effects of e-cigarettes, so this is a very immoral advertising tactic designed to emphasize people's fear of this, often fatal, disease. (U.S. National Library of Medicine, n.d.)

Picture 2

Blu: Doctors&Nurses



Source: SRITA (n.d.)

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Helps You Quit

In advertisements for e-cigarettes, their manufacturers convince consumers that e-cigarettes are a "safer" alternative to traditional cigarettes.

Manufacturers thus market e-cigarettes as a "healthier" and more "environmentally friendly" recreational product to which consumers would be "wise" to switch. The advertisement for Blu states that the e-cigarette is "a smart choice for smokers who want a change." The ad headline reads: "Why stop, switch to Blu." Another ad for an e-cigarette vendor shows an image of a well-built woman who kicks a man smoking a regular cigarette (SRITA n.d.).

Picture 3

LMAE: Why Quit? Just Switch! Try Now!



Source: SRITA (n.d.)

Smart, Pure & Fresh

Many e-cigarette company brands use numerous forms of the word "smart" in their ads (eg, intelligig, smart e-cigarette, Kanger e-smart). One of the reasons for choosing such names is the effort of tobacco companies to alleviate the concerns of worried smokers. The purpose of such brand names is to communicate to potential users that they are smarter about choosing a digital product over a regular cigarette and that they can trust such a brand.

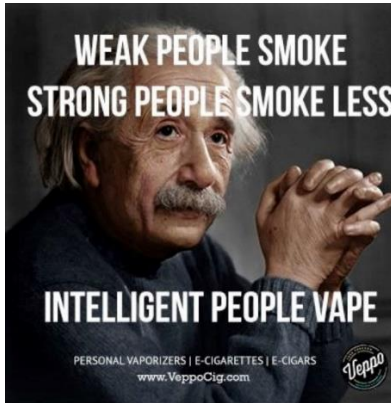
Likewise, e-cigarette producers often use positive images and slogans that divert attention away from the negative effects of smoking – the implicit message being that you would be smarter to use an e-cigarette than conventional cigarettes. Visual images, which contain symbols of health, pleasure, and social desirability, similarly want to convince consumers that these are healthy products (SRITA, n.d.).

In 2010, the use of light, mild, or fresh descriptors to prevent smoking cessation became legally prohibited. Even though scientific studies have not shown any health benefits in switching to low-tar cigarettes (e.g., light, low-tar, mild cigarettes), many smokers still think that these products are better for their health. However, most smokers are not aware that they just found another way to achieve the same "target" level of nicotine. Other studies show that using low-tar cigarettes actually delays quitting efforts (Shopland et.al., 2001)!

Examples of companies using soothing descriptors and brand names include E-Lites, Go-Lites, Vapourlites, EZlite, and mild e-vaporizer. Even when designing the packaging, they use white, green, light blue or silver color shades that remind us of lighter and healthier products (Wakefield et.al., 2002).

Picture 4

Veppo: Weak People Smoke, Strong People Smoke Less, Intelligent People Vape



Source: SRITA (n.d.)

(Sweet) Flavors

The e-cigarette industry intensely claims that it only targets adults and established smokers. The abundance of vape juices with alcoholic or sweetened flavors and sweet names serve to make these products attractive to children and teenagers who like to experiment with tobacco products and are overwhelmed by misconceptions about the "safe nature" of e-cigarettes.

E-cigarettes and e-juices come in a variety of chocolate flavors, including milk chocolate, coffee chocolate, chocolate mint, chocolate caramel, chocolate peanut butter, chocolate banana, and chocolate strawberry. You can also find ice cream, candies, cookies, donuts, cakes and pies, mint, beverages and other flavors, colors, and shapes.

When advertising chocolate-flavored e-cigarettes, images of decadent pieces of chocolate are common. Some examples of packaging are designed to closely resemble popular chocolate brands (SRITA, n.d.).

Picture 5

Vapor Wise: Inhale Flavor, Curb Cravings, Lose Weight



Source: SRITA (n.d.)

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Women Targeting

E-cigarette manufacturers often target women through dedicated brands such as Vapor Couture and Luli. Some companies are using ads that feature highly successful and independent women in occupations that have long been considered exclusively male.

It is normal to see pink e-cigarettes next to a bouquet of red roses or lipstick. These images are intended to allow women to associate e-cigarettes with a harmless fashion accessory that is as crucial and fundamental as a make-up mirror or lipstick.

A common trick they use is to use social/health reasons for their own benefit. In 1992, the pink ribbon became the official symbol of breast cancer awareness. Since then, the color pink has often been linked with support for women who survived breast cancer, and women's solidarity. In this way, the manufacturers of e-cigarettes try to gain the willingness of the public and indicate to potential consumers that the product is not unsafe (SRITA, n.d.).

Picture 6

Eversmoke: Save a Life. Save a Lung. Save a Boob



Source: SRITA (n.d.)

Sex Sells

E-cigarette manufacturers know this well and don't hesitate to use phallic symbols or objectify women to sell their products.

For example, Blu also sponsored Playboy parties that allowed visitors to meet Playmates. Playboy itself tackled this when it created its own Playboy e-cigarettes. Certain ads for Playboy e-cigarettes with the registered bunny symbol advertised free condoms if you bought a vaporizer. Phantom Smoke shamelessly emphasized the objectification of women in its advertising. Many ads show scantily clad women in submissive positions to men. Ad for Krave e-cigarettes shows a woman wearing a bodysuit sitting on the side of a sofa with her legs slightly apart, looking towards the viewer.

In addition to online and print ads that abuse sexuality to sell a product, online videos are full of sexual innuendo. For instance, ad for the VIP e-cigarette featured a sultry-looking woman saying, "I want you to get it out. I want to see it. Feel it. Hold it. Put it in my mouth. I want to see how great it tastes." The online and TV ad, which aired in Britain, attracted 937 complaints about its "overtly sexual" tone (SRITA, n.d.).

Picture 7

Westons: I've got some bad habits but smoking isn't one of them.



Source: SRITA (n.d.)

Eco Friendly

"Going green" is a very popular behavior these days, so it is understandable that the marketing mechanism of the e-cigarette industry also loudly proclaims that its products are environmentally friendly and better for health and the environment than conventional cigarette products. A lot of e-cigarette companies mention that their products do not produce smoke, only vapor, and are therefore less littering than conventional tobacco products. Green Smoke says it "aspires to create a greener planet" by offering cigarettes that are free of second-hand smoke, ash and fire hazards. SouthBeach Smoke similarly equates the healthier aspect of e-cigarettes i.e. without carcinogenic substances and without smoke, as a more environmentally friendly product.

Companies often use subliminal brand names such as Green Smoke, Eco-Cigs, Ever Smoke, EverGreen Vapor, Enviro and Green Nicotine. Many ads also use claims such as "additive-free," "organic," and "eco-friendly," meaning that the ingredients are "clean" and not harmful to humans or the environment. Manufacturers are also keen to point out that their products are mostly reusable. That's why we don't throw them away and don't accumulate in landfills and pollute the environment. Nonetheless, the eco-friendly nature of e-cigarettes should be closely inspected.

E-cigarettes contain numerous plastic and metal components that must be disposed of properly. Furthermore, nickel-cadmium or lithium batteries used in e-cigarettes should be properly disposed of in an e-waste recycling container. If e-cigarettes are not disposed of properly, they pose an even greater polluting burden than traditional cigarettes (SRITA, n.d.).

Picture 8

Logic Smoke: It's Simple



Source: SRITA (n.d.)

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eCig Designs

There are two different styles of e-cigarettes. E-cigarettes that are shaped like technologically superior pens and smartphones, and e-cigarettes that seem and work like traditional cigarettes. For numerous heavy smokers, the whole smoking experience is important. For example, how they feel the cigarette in their hand, the taste and smell of the product, the way it burns their throat - all this contributes to their enjoyment of smoking. Some studies have shown that satisfaction with smoking decreases if smokers do not experience these feelings (SRITA, n.d.).

Picture 9

V2Cigs: It's New. It's Cool. It's Blue!



Source: SRITA (n.d.)

Tobacco Owned Brands

Tobacco producers entered the e-cigarette industry. Among them are Imperial Tobacco, British American Tobacco, Japan Tobacco International and Philip Morris International.

Table 2

Selection of producers and brands

Company	Brand - classic	Brand – e-cig
CNTC – The China National Tobacco Corporation	Hongmei, Yunyan, Lesser Panda, Furong, Red Goldem Dragon, Chunghwa	Kuanzhai Kungfu, MC, MOK
BAT - British American Tobacco, incl. R. J. Reynolds and Lorillard	Dunhill, Kent, Lucky Strike, Pall Mall, Rothmans, Camel	Vuse, Glo, Velo
Imperial Tobacco	JPS (John Player Special), Davidoff, Gauloises, West, Winston, Kool	Blu, Pulze, Zone X
JTI – Japan Tobacco International	Winston, Camel, LD, Benson&Hedges	With, Logic, Ploom,
PMI – Philip Morris International	Marlboro, Parliament, L&M, Muratti, Chesterfield	Iqos, Bonds by Iqos, Lil Hybrid, Veev One, Zyn

Source: companies' web pages (for CNTC, Tobaccotactics, 2023)

Lorillard was the third largest cigarette producer in the US and a market leader in e-cigarettes (49% market share in 2011). They entered the British market for e-cigarettes in 2013 by acquiring Skycig, a British e-cigarette company. Skycig was rebranded to Blu (with a 20 million GBP marketing campaign). In 2014, Lorillard was acquired by RJ Reynolds – that had to sell Blu (to Imperial Tobacco). In 2017, the company was sold to British American Tobacco (Lorillard, n.d.)

Curbing the Cloud: Prohibited E-cigarette Marketing Campaigns in Europe

In some countries they have already started strong activities to minimize the effect of e-cigarettes themselves and fake news about them. E-cigarettes have appeared as a controversial product in the European market. While supporters push them as a harm-reduction tool for smokers, public health concerns regarding their long-term effects and potential appeal to non-smokers, particularly youth, have fueled regulatory debates. We try to present some examples of specific e-cigarette marketing campaigns in Europe that were prohibited due to contravening regulations.

The European Union (EU) enacts a framework for tobacco advertising and promotion through Directive 2014/40/EU. This directive prohibits most forms of advertising for tobacco products, including e-cigarettes. The definition of advertising is broad, encompassing "any form of commercial communication, regardless of the medium used, that directly or indirectly promotes a tobacco product", and it also restricts product placement and free samples (European Commission, 2014). Additionally, member states have the authority to implement stricter regulations. However, the evolving digital landscape and the fact that e-cigarettes are still a relatively new phenomenon have presented challenges in implementation. Nevertheless, several e-cigarette marketing campaigns across Europe have been prohibited for disregarding these regulations. One prominent example of a prohibited campaign is *the use of social media influencers* by tobacco companies. They partnered with influencers to promote their products in a seemingly organic way, often without clear disclosure of sponsorship. In 2019, concerns arose around British American Tobacco's (BAT) marketing of their Vype e-cigarette brand in the UK. The campaign allegedly involved social media influencers posting photos showcasing themselves vaping Vype products, usually without evident disclaimers that this activity was sponsored (Furlong, 2019). This tactic exploits a potential loophole in regulations, as influencer marketing can be seen as a form of indirect promotion rather than explicit advertising.

Another marketing strategy that has been restricted is *the use of flavors*. E-cigarette marketing often portrays vaping as a trendy, glamorous, or rebellious activity. Fruity, bubblegum and candy-like flavors are heavily promoted, especially in disposable vapes, which can be particularly attractive to young people (Stead et.al., 2021), who might be tempted by the taste rather than the presence of nicotine (European Commission, 2014). Finland, for instance, has stricter regulations than the EU as a whole. Their legislation bans not only the marketing of e-cigarettes but also flavored nicotine liquids (Ollila, 2020).

Misrepresentation of Health Benefits is also one of prohibited tactics, especially unsubstantiated claims about e-cigarettes being a safer alternative or even smoking cessation tool. Public health authorities argue such claims downplay the potential health risks associated with e-cigarette use (Furlong, 2019; IEVA 2023).

Measures authorities implement to improve the situation

Strengthening regulations: The European Union is constantly evaluating and updating actions to address emerging market tactics. This also means the gradual banning of certain flavors of e-liquids and the tightening of controls on online advertising (Conway, 2024).

Enforcement of existing regulations: Authorities are intensifying prosecution efforts to detect and punish companies that violate the advertising ban. Social media platforms must cooperate in removing unauthorized or suspicious content (Conway, 2024).

Public health campaigns: Public health agencies are launching campaigns to combat messages that promote vaping. These campaigns usually highlight the (potential) health risks of vaping and highlight the lack of effectiveness of vaping as a smoking cessation tool (East et.al., 2024).

CONCLUSIONS

We have only touched the tip of the iceberg of the issue of e-tobacco products and the false communication related to them. Several parts of the world, especially where the data is more difficult to access, were not taken into account.

In our research, we found many controversial practices similar to those used by tobacco companies in the past to promote cigarettes. E-cigarettes are also presented as safe, modern, fun, and attractive, especially for young people.

Tobacco companies still deny or try to relativize the harmful effects of e-cigarettes on health and the environment, despite the fact that so far, no serious research has been done. What's more, e-cigarettes are often mentioned as a (safer) alternative to smoking traditional cigarettes, or even as an aid for quitting smoking! In any case, in addition to nicotine, the aerosol contains humectants (propylene glycol and/or glycerol), various aromas, carcinogenic substances (formaldehyde, tobacco-specific nitrosamines, benzene), heavy metals (nickel, chromium, lead, aluminum, cadmium, manganese, tin, copper), other chemical substances (acrolein, glycosal...), small particles... (NIJZ, n.d.). There is still not enough research to prove how harmless smoking e-cigarettes might be (Sila, 2018).

In addition, tobacco companies exert strong pressure on politicians and public opinion to prevent or weaken the regulation of tobacco products.

The ban on e-cigarette advertising campaigns in Europe highlights the ongoing debate about the public health implications of these products. As the regulatory environment continues to evolve, the focus on protecting public health, particularly the health of young people, is likely to remain dominant.

The situation in some parts of the world, especially in Asia, is much less regulated, which the governments of these countries will have to deal with in particular.

It is difficult to assess the effects of bans and restrictions, as both manufacturers and retailers are constantly looking for shortcuts to consumers, who are often not even aware of the promotion of e-cigarettes. The use of modern advertising approaches, neuromarketing techniques and the insufficiently controlled use of social networks affect the success of e-tobacco companies.

Further research is needed to assess the long-term health effects of e-cigarette use in all forms and the effectiveness of current marketing restrictions.

Fake news, fake facts, myths – different words for the same phenomena have flourished uncontrollably with the development of the Internet and the tools of artificial intelligence and social media. The effect of fake news is as strong as it is widely distributed. In the shortest possible time, an interesting new piece of information, a fact, a piece of evidence, which we may forget the next moment, will land in the readers' minds. The problem and the beauty of the Internet is that even forgotten information can quickly appear again.

It is our responsibility as recipients of information to be careful when consuming media. If we want to avoid the effect of fake news (in marketing), we need to follow a few simple rules that apply even more today than in the past: follow quality and objective media, be a responsible and well-informed audience, and use common sense (Sila, 2017).

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A COMPREHENSIVE EVALUATION OF FACE RECOGNITION SOFTWARE: BALANCING TOTAL COST OF OWNERSHIP, ACCURACY AND SPEED

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Abstract: *As face recognition technology continues to play a pivotal role in various domains, selecting an optimal software solution becomes imperative. This paper thoroughly analyzes face recognition algorithms, emphasizing a holistic assessment of implementing them that includes the overall cost of ownership, accuracy, and speed. The research aims to guide decision-makers in choosing a solution that balances these three critical factors. The study employs a rigorous methodology and evaluates various intrusion detection solutions across multiple industries. It examines the cost of ownership comprehensively, including initial investment, maintenance expenses, and potential hidden costs. A cost-benefit analysis is conducted to unveil the true economic implications of each implementation. The accuracy of the face recognition algorithms which is the core of intrusion detection systems is assessed through the learnings from academia and real-world feedback from the security industry. Furthermore, the paper examines the critical aspect of speed, recognizing its important role in real-time applications. The evaluation considers the processing speed of each software solution, considering its responsiveness to various environments and working with large-scale datasets. This research provides a comprehensive overview of face recognition algorithms, offering small business decision-makers valuable insights to make informed choices for their intrusion detection solutions. By combining the total cost of ownership, accuracy, and speed, organizations can select a solution that aligns with their specific needs and maximizes the return on investment in intrusion detection technology.*

Keywords: *Face recognition, Deep Learning, Object Detection, total cost of ownership.*

INTRODUCTION

The overall security of small businesses is very important. The enterprises are vulnerable to a range of threats that can severely impact their daily operations, including financial stability and reputation. Small businesses face a set of unique challenges in terms of security due to their limited resources, size, and specific operational characteristics. The most important challenges are related to limited budgets, resource constraints, lack of in-house expertise, and dependency on third-party services. Recognizing the challenges allows small businesses to tailor their security plans accordingly, emphasizing cost-effective solutions.

While it is impossible to address all the challenges, we will focus on physical security by providing a free intrusion detection solution. For our paper, we will use data that we have collected in the USA market. However, the adoption of sophisticated surveillance systems,

leveraging cutting-edge technologies such as AI-powered analytics and cloud-based solutions, is not exclusive to the United States. In today's interconnected world, the USA's video security landscape reflects a global paradigm applicable to other countries

Globalization and the knowledge driven technological revolution are important instruments for national economic progress. As a result, increasing innovation has emerged as a critical requirement for an organization's competitiveness and sustainability in both domestic and global markets. Small sized enterprises are crucial to the creation of each nation's gross domestic product in the modern economy. Due to the numerous amounts of small businesses, changes in the business environment have mitigated the structural disadvantages of small-sized businesses (Živanović, Abramović, Živanović, & Smolović, 2023).

This paper aims to examine the current landscape of commercial offerings for intrusion detection provided to small businesses and compare the total cost of ownership against an intrusion detection solution we will build by choosing the proper face recognition algorithm.

The solution is free of charge to small businesses. In this paper, we have a close look at the most popular face recognition methods and compare them against each other. We will choose two algorithms to implement our solution.

In future work, we will conduct a series of tests on the chosen algorithms to check their accuracy and validate that this is the right choice to address the video surveillance security of small businesses.

CURRENT VIDEO SECURITY SOLUTIONS CATERING TO SMALL BUSINESSES

We have conducted market research and selected a list of the most predominant security alarm companies in the USA that cater to small businesses:

- ADT: They provide custom-built security systems with features like 24/7 professional monitoring, intrusion detection, fire protection, and even cybersecurity options. While on the costlier side, they offer a comprehensive security solution. (ADT, 2024)
- SimpliSafe: Known for affordability and DIY installation, SimpliSafe offers business-friendly packages with features like entry sensors, security cameras, and environmental monitoring. (SimpliSafe, 2024)
- Vivint specializes in high-end security systems with features like smart home integration, access control, and video surveillance. It offers professional installation and monitoring. (Vivint, 2024)
- Frontpoint: Another DIY option, Frontpoint provides scalable security systems for small businesses. Their features include entry sensors, security cameras, and medical alert options. (Frontpoint, 2024)
- Guardian Alarm: Offers monitored security systems with features like 24/7 video surveillance, intrusion detection, and fire protection. They cater to businesses of all sizes. (Guardian Security, 2024)

Since the paper's objective is to evaluate the total cost of ownership and find out if there is scope for a tailored solution for small businesses, we also looked at the costs associated with each of the solutions mentioned above.

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These are estimated costs based on publicly available information and may vary depending on chosen packages, equipment needs, and additional services. For each individual small business, the best way is to get quotes directly from each company for the most accurate pricing for their specific business needs. However, this does not change the validity of our analysis since we will be looking at the starting prices offered to small businesses and not at the more expensive custom-made prices. The following table is a summary based on the market research; to get some of the quotes, we had to use different ZIP codes; otherwise, the information is not possible to obtain from public sources.

Table 1
Summary based on the Market Research

Company	Equipment Cost	Monitoring Cost (Monthly)	Total Yearly Cost
ADT	Starts at ~\$600	Starts at ~\$37	Starts at ~\$1,044
SimpliSafe	Starts at ~\$500	Starts at ~\$25	Starts at ~\$800
Vivint	Starts at ~\$1,000	Starts at ~\$40	Starts at ~\$1,480
Frontpoint	Starts at ~\$400	Starts at ~\$35	Starts at ~\$820
Guardian Alarm	Starts at ~\$400	Starts at ~\$30	Starts at ~\$760

Source: Author own elaboration. (2024)

For the sake of completeness, there are some additional factors to consider when choosing a small business security system, such as:

- Security Needs: Is it physical security of the premises only, or shall it include fire, environmental hazards, etc.?
- Business Size and Layout are important factors in choosing a system that can effectively cover the entire building.
- Scalability, the security needs might grow in the future, and a system that can adapt.
- Integration: whether the system integrates with other business tools you use (e.g., access control systems or productivity tools such as a work calendar).

FACE RECOGNITION ALGORITHMS

Face recognition approaches have evolved over the years. There are two broad categories: traditional methods and deep learning methods. Deep learning methods are specialized versions of the most generic object detection algorithms.

We will first describe the fundamentals of the most popular object detection and face recognition algorithms and then focus on their differences. We will use three criteria for the evaluation: computation power (directly related to cost), accuracy, and speed.

Fundamentals

Before we dive in, let's start with the main concept of face recognition. The steps involved in a typical face recognition system are as follows:

- Data Collection:

- This step is fundamental since it is the algorithm's baseline. The idea is to acquire a dataset of facial images. This dataset should include images of various individuals under various conditions, such as different lighting, poses, and expressions.
- The more diverse and representative the dataset, the better chance for the system to generalize to new faces.
- Preprocessing:
 - Normalize the images to ensure consistency in terms of lighting conditions, resolution, and facial expressions. In simple terms, we need to compare apples to apples.
 - Perform face detection and alignment to locate facial features accurately. This step is very important for standardizing the position and orientation of faces in the images.
- Feature Extraction:
 - Extract relevant features from the preprocessed facial images. Different techniques are used, such as Principal Component Analysis (PCA), Linear Discriminant Analysis (LDA), and Convolutional Neural Networks (CNNs).
 - Generate a feature vector that represents the unique characteristics of each face in the dataset.
- Training the Model:
 - Use the extracted features to train a face recognition model. This step can use traditional machine learning algorithms or deep learning neural networks.
 - The model learns to differentiate between different individuals using the unique feature vectors that were generated during the previous phase.
- Dimensionality Reduction:
 - This step is optional and aims to make the algorithm more efficient and less prone to overfitting. The goal is to reduce the complexity of the feature space.
- Face Encoding:
 - Face encoding serves as a unique identifier for each person. For each individual in the dataset, a compact representation of their facial features is generated.
- Testing Phase:
 - There are similarities between the training phase and the testing phase. The preprocessing, feature extraction and dimensionality reduction in the testing phase are accomplished in the same way as in the training phase.
 - The trained model is used to compare the new face encoding with the stored encodings of known individuals.
- Decision Making:
 - This is decision time, so we apply a rule to determine the individual's identity. We look at the similarity between the new face encoding and the stored encodings.
 - In addition to the rule, a similarity score threshold must be used to decide whether the face belongs to a known individual or is an unknown face.
- Verification / Identification:
 - There is a slight difference between verification and identification.

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- In verification scenarios, the decision is binary; the presented face matches a specific individual's encoding.
- In identification scenarios, the presented face is compared against the dataset of all known encodings to find the closest match.
- Post-Processing:
 - This is the time when we need to close the feedback loop. The goal is to refine the recognition results and/or update the model with new data.

As with any machine learning algorithm, the effectiveness of a face recognition system depends on the quality and diversity of the training data, the choice of features, and the robustness of the algorithm (Osowski & Siwek, 2020).

Eigenfaces

The primary goal of Eigenfaces is to represent facial features in a lower-dimensional space by capturing the principal components of the face images. It aims to preserve as much variance as possible, making it suitable for general facial recognition applications. The Eigenfaces algorithm uses Principal Component Analysis (PCA) to represent facial features in a lower-dimensional space. PCA recognizes the directions of maximum variance in the data, and the corresponding eigenvectors form the basis for the reduced-dimensional space (Peng, Portugal, Alencar, & Cowan, 2021). The representation obtained by Eigenfaces is based on the principal components of the face images. "These components are linear combinations of the original pixel values, capturing the overall variance in the dataset (Omer, 2024). The drawback of PCA is the sensitivity to variations in lighting conditions, as it tends to capture overall variance, which can include variations caused by illumination.

Fisherfaces

Fisherfaces emphasizes the differences between individuals rather than capturing the overall variance in the dataset. It employs Linear Discriminant Analysis (LDA) to find a projection that maximizes individual separation while minimizing variations within the same individual. Fisherfaces use Linear Discriminant Analysis (LDA) for dimensionality reduction. "LDA aims to find a projection that maximizes the ratio of the between-class scatter to the within-class scatter, focusing on the discriminative power of the features". The representation obtained by Fisherfaces is designed to maximize the differences between individuals. The features selected by LDA are most effective in discriminating between different classes (individuals). Fisherfaces can be sensitive to class variations, especially when dealing with small datasets or when the within-class scatter is high. In situations where there is significant variability in the images of the same individual (such as different facial expressions, poses, or lighting conditions), Fisherfaces may not effectively capture the essential features that distinguish between individuals.

Local Binary Patterns (LBP)

Local Binary Patterns (LBP) are commonly used in face recognition as a texture descriptor to capture discriminative features from facial images. The technique is particularly

robust to variations in lighting conditions, making it suitable for handling challenges often encountered in face recognition applications.

The basis of LBP is on Local Neighborhood Definition (define a local neighborhood by specifying a radius and the number of sampling points on the circumference of a circle) and LBP Calculation (Create a binary pattern by concatenating the 0/1 values obtained from the comparisons in a specific order around the center pixel).

While LBP is effective in certain scenarios, it may not capture complex spatial relationships or be robust to other variations, such as pose changes. In practice, LBP is often combined with other feature extraction techniques or used as part of a more comprehensive face recognition system to improve overall performance.

Support Vector Machines (SVM)

It's a supervised machine learning algorithm renowned for effectively categorizing data elements into two groups. SVMs come in two primary categories: Linear and Non-Linear SVMs. Linear SVM is applied when data is perfectly separable by a straight line, while Non-Linear SVM handles scenarios where data points aren't linearly separable. In such cases, advanced techniques like kernel tricks are employed to facilitate classification. Since linear separability is rare in real-world applications, kernel tricks are commonly utilized to address these complexities.

SVM works faster and more accurately when the data is linearly separable, and when we employ the kernel trick any complex problem can be solved. However, some issues in face recognition must be considered, such as the difficulty of choosing a good kernel, the inaccuracy for big datasets, and the difficulty of tuning the hyper-parameters.

Deep Learning (CNN-based)

Deep Learning proves immensely valuable in object classification tasks, notably in face recognition algorithms. The initial approach employed was the Convolutional Neural Network (CNN). The essence of this algorithm involved segmenting the image into multiple regions and subsequently classifying each region into distinct categories. However, a challenge arises due to the considerable number of regions necessitating accurate prediction, resulting in prolonged computation times.

Subsequently, the Region-Based Convolutional Neural Network (RCNN) emerged as an advancement over CNN. Built upon the foundation of CNN, RCNN integrates selective search to generate regions, thereby reducing their number to around 2000 per image. Although this marks an improvement over CNN, the computational requirement remains high. Each region is individually passed to the CNN, resulting in processing times of 40 to 50 seconds per image—rendering it unsuitable for real-time applications.

The next algorithm was Fast RCNN. It resolves the main issue of the RCC so that each image (1) is passed only once to the CNN, (2) feature maps are extracted, and (3) selective search is used on these maps to generate predictions (Rajeshkumar et al., 2023). It reduces the time to 2 seconds per image, but the computation time is still high (Jiang et al., 2021).

The next algorithm was Faster RCNN. The main difference to the Fast RCNN is that “the selective search method is replaced with a region proposal network (Faulkner, 2021). This had a dramatic positive impact on the algorithm speed, going down to 0.2 seconds per image.

You Look Only Once (YOLO)

Deep Learning methods such as RCNN, Fast RCNN, and Faster RCNN are categorized as two-stage object detectors. The main concept is that they need several passes to the image. Two additional algorithms, YOLO (You Only Look Once) and SSD (Single Shot Detectors), are categorized as one-stage object detectors, where the image is taken all at once. The other object detection algorithms work on a classification problem, while YOLO works on a single regression problem (Redmon, Divvala, Girshick & Farhadi, 2016). The system only looks at the image once to detect (a) what objects are present and (b) where they are. The system divides the image into a grid of cells. Each grid cell predicts B bounding boxes and confidence scores for these boxes. The confidence score considers the probability that the box contains an object and the accuracy of what box it is predicting (Cortes & Jose, 2021).

Each grid cell predicts C conditional class probabilities, producing a single set of class probabilities per cell irrespective of the number of boxes B . In the testing phase, these conditional class probabilities are combined with individual box confidence predictions. This multiplication yields class-specific confidence scores for each box, indicating both the class's probability and the box's fit to the object (Zhang & Cloutier, 2022). The algorithm uses the concept of IoU to consider a bounding box. By default, the value is set at 0.5, and setting it to higher values will reduce the false positive while increasing the false negatives. The bounding box is not considered when the corresponding IoU is less than the predefined threshold (Pham, Courtrai, Friguet, Lefèvre & Baussard, 2020). Another pillar of the algorithm is non-max suppression. Depending on the specific circumstances, the algorithm may find multiple detections of the same object; however, using non-max suppression, the object will be detected only once. YOLO has been in several iterations, from YOLOv1 to YOLOv7, and each iteration has brought major advancements in features and overall performance. Several key features, such as anchor boxes, intersection over union, and non-max suppression, offer great help in detecting objects of various sizes and classes.

Single Shot Detectors (SSD)

SSD and YOLO exhibit numerous parallels. Both partition the input image into grids, assessing the presence of objects within each cell. However, their primary difference lies in how they tackle bounding box regression. SSD treats each bounding box prediction as a regression problem, commencing with the anchor box possessing the highest IoU and progressively adjusting towards the ground truth bounding box while calculating loss. Conversely, YOLO predicts multiple bounding boxes for each recognized object, employing non-max suppression to eliminate redundant boxes while preserving the final box coordinates.

We have kept the same criteria for evaluating the object detection and face recognition algorithms: total cost of ownership, speed, and accuracy. If we have to compare SSD and YOLO against each other, SSD is somewhat more accurate, most of which occurs because of its ability to recognize things of different sizes. However, YOLO speed is faster than SSD (Sun, 2023). As part of our future work, we will implement both these algorithms in our solution and compare them against each other. We will use available Python libraries for both algorithms and check out both CPU and GPU options (Kumari Sirivarshitha, Sravani, Priya, & Bhavani, 2023).

COMPARISON BETWEEN ALGORITHMS

Deep learning algorithms (CNN-based) generally offer the best accuracy but at the cost of higher computational power (additional steps) and slower processing times. In general, simpler algorithms might be a better choice for speed-critical applications or those with limited resources, but with a trade-off in accuracy. The optimal choice depends on the specific application and its requirements.

The table below summarizes the comparison between today's algorithms used for face recognition (to be fair, there are other dimensions to add to the comparisons, such as data set size and complexity, so we are considering an "average" size dataset):

Table 2

Summarizes the comparison between today's algorithms used for face recognition

Category	Algorithm	Computational Power	Accuracy	Speed
Traditional	Eigenfaces	Low	Moderate	Fast
	Fisherfaces	Low	Moderate	Fast
	Local Binary Patterns (LBP)	Low	Moderate	Moderate
	Support Vector Machines (SVM)	Low	Moderate	Moderate
Deep Learning two stage detection	Deep Learning (CNN-based) <ul style="list-style-type: none"> • CNN • RCNN • Fast RCNN • Faster RCNN 	High	High	Slow
Deep Learning one stage detection	Single Shot Detectors (SSD)	Moderate	High	Fast
	You Look Only Once (YOLO)	Moderate	High	Fast

Source: Author own elaboration. (2024)

Based on the research results and industry feedback, we will consider using one of the Deep Learning algorithms with one-stage detection since they check all our evaluation criteria. If we stack them against each other (SSD vs YOLO), the SSD algorithm provides slightly better accuracy but at the cost of the speed of detection. Both these algorithms are implemented in Python and provide a practical approach to being utilized in real-life scenarios.

COMPARISON BETWEEN SOLUTIONS (COMMERCIAL OFFERINGS VS OURS)

Now that we have selected the best-suited algorithm to build our solution, we need to compare it against commercial offerings for small businesses. In the “Current Video Security Solutions Catering Small Businesses” chapter, we examined the estimated costs based on publicly available information on the most popular security companies catering to small businesses.

*A COMPREHENSIVE EVALUATION OF FACE RECOGNITION SOFTWARE:
BALANCING TOTAL COST OF OWNERSHIP, ACCURACY AND SPEED*

As we mentioned our solution will be free of charge so we need to consider only the initial costs which include the cost of IP cameras and the computer where the software will be running. There are no specific requirements for IP cameras, so generic ones will be considered adequate for the job. The cost of such cameras is about 30 USD per unit. Based on the layout of the building, we believe that a maximum of eight (8) cameras will cover all the spots. Buying the cameras in bulk changes the unit economics to 25 USD per unit. The overall cost of cameras is about 200 USD. The computer running the software does not have any stringent requirements. Furthermore, this computer is not dedicated to intrusion detection only and can be used for other tasks. For better performance, we can use GPU in addition to CPU, but it is not mandatory. We consider an estimated cost of 800 USD for the computer to cover the high-end demand.

The following table can be used to compare the commercial offerings versus the solution we are building:

Table 3
Compare the commercial offerings versus the solution we are building

Company	Equipment Cost	Monitoring Cost (Monthly)	Total Yearly Cost
ADT	Starts at ~\$600	Starts at ~\$37	Starts at ~\$1,044
SimpliSafe	Starts at ~\$500	Starts at ~\$25	Starts at ~\$800
Vivint	Starts at ~\$1,000	Starts at ~\$40	Starts at ~\$1,480
Frontpoint	Starts at ~\$400	Starts at ~\$35	Starts at ~\$820
Guardian Alarm	Starts at ~\$400	Starts at ~\$30	Starts at ~\$760
Our solution	Starts at ~\$1,000	Free of charge	Free of charge

Source: Author own elaboration. (2024)

While there is an initial investment in hardware (IP cameras and the computer), the solution, which is free of charge, can help small businesses address physical security via intrusion detection.

CONCLUSIONS

Our initial goal was to find two face recognition algorithms best suited for intrusion detection applications. We evaluated three criteria: total cost of ownership, accuracy, and speed. Based on the research results and industry feedback, we will consider using one of the Deep Learning algorithms for our next research step. Having selected our algorithms (Deep Learning with one-stage detection), we critically examined whether this solution outperformed existing commercial offerings, thereby justifying its use in our research.

We believe that our solution addresses the need for intrusion detection. Offering it free of charge and having small businesses only purchase the hardware is a valid option for small businesses to address physical security. From an implementation perspective, we will use standard IP cameras (inexpensive) connected to a computer (either CPU or GPU), several Linux utilities to convert the video stream to images (we will configure the sampling rate), and

then analyze the images. In future work, we will conduct a series of tests on the chosen algorithms (SSD and YOLO) to check their accuracy and validate that they are their accuracy and validate that they are the right choice to address the video surveillance security of small businesses.

The goal is to exceed 99% accuracy if the person is captured on camera for more than one minute (non-contiguous). We will tune the system to find the ideal sampling video rate and the number of cameras covering an indoor space. Based on that, we will calculate the platform's cost and compare it to the current offerings for smaller businesses.

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STRATEGIES FOR THE DEVELOPMENT OF INTERNATIONAL TRADE IN UKRAINE

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***Abstract:** Foreign economic security is one of the key aspects of the stable development of the economy of any country, including Ukraine. To strengthen it, it is necessary to develop and implement strategic directions aimed at ensuring reliable and sustainable functioning of the economy and reducing its dependence on external risks. The practical significance of the study of strategies for the development of the State's foreign economic activity is to identify the main guidelines for Ukraine's further development in the context of post-war recovery. The purpose of the study is to identify the main strategic directions for the further development of Ukraine's foreign trade operations caused by the development of the European integration process, the complication of the political and legal situation, and changes in partnership relations between countries. The following priority areas of action have been identified for Ukraine's foreign trade in view of European integration: adherence to and acceleration of the strategic sequence of reforms, taking into account changes in the state of political and economic relations; Increasing financial and technical support from the EU, subject to the conditions for increasing the transparency of cash flows and the efficiency of their use; increasing partnership with non-European countries.*

***Keywords:** international trade, European integration, neo-protectionism, war, development.*

INTRODUCTION

The intensification of international relations and trade is driven by their dynamics and the growing integration of states. The number of strategic alliances in international business is steadily increasing. For Ukraine, this issue is relevant because there is a growing need to develop partnerships in modern business under martial law and integration processes in the global economy. At the same time, there is a phenomenon of neo-protectionism that significantly complicates Ukraine's foreign trade, weakened by Russia's aggression, which has destroyed most logistics connections.

The purpose of the study is to identify the main strategic directions for the further development of Ukraine's foreign trade operations caused by the development of the European integration process, the complication of the political and legal situation, and changes in partnership relations between countries. To achieve this goal, the tools of theoretical generalization, analysis and synthesis were used. Based on the results of research by leading scholars, the main challenges accompanying the development of Ukraine's trade with partner countries are identified.

Foreign economic security is one of the key aspects of the stable development of the economy of any country, including Ukraine. To strengthen it, it is necessary to develop and implement strategic directions aimed at ensuring reliable and sustainable functioning of the economy and reducing its dependence on external risks. The practical significance of the study of strategies for the development of the State's foreign economic activity is to identify the main guidelines for Ukraine's further development in the context of post-war recovery.

Ukraine's international trade with EU

A country's foreign economic activity is important in addressing a number of issues related to the sustainable functioning of the economy and preventing crises. This sector is responsible for providing the necessary resources, technologies, and innovations required for the production of goods. The development of foreign trade helps to build up the resource potential and ensures the growth of national income. The need to improve Ukraine's foreign economic activity is caused by the problems of the economy's dependence on monopoly markets for imports of goods and resources, the quality of exported goods, and the expansion of their supply. Ukraine cannot stay away from the integration processes taking place in the global economic space.

The decline in GDP and the corresponding depreciation of key economic assets limits the creation of added value at Ukrainian enterprises and significantly reduces their economic security. However, there is an increase in Ukraine's commodity trade with the EU member states; since 2016, there has been a gradual increase in cooperation with the EU in both exports and imports of goods, which is shown in Table 1.

Table 1
Exports and Imports of Ukrainian Goods from the EU and Other Countries in 2014-2023, USD billion

Years	Exports			Import		
	The EU	Other countries	Total	The EU	Other countries	Total
2014	17,00	36,90	53,90	21,07	33,36	54,43
2015	13,02	25,11	38,13	15,33	22,19	37,52
2016	13,50	22,86	36,36	17,40	21,85	39,25
2017	17,53	25,73	43,26	20,80	28,81	49,61
2018	20,16	27,17	47,33	23,22	33,97	57,19
2019	20,75	29,30	50,05	25,01	35,79	60,8
2020	18,61	30,60	49,21	23,50	30,59	54,09
2021	26,79	41,30	68,09	28,30	44,52	72,82
2022	27,80	16,40	44,20	27,00	28,30	55,30
2023	22,69	13,50	36,19	43,20	20,36	63,56

Resource: Zubko, 2021.

The decline in the volume of domestically produced goods was accompanied by a corresponding decline in its export potential. By the end of 2023, the share of Ukraine's

merchandise exports in global exports decreased to 0.19%, which is half of the 2014 year's figures. The decline in exports also affected the ability to supply imported goods. The share of domestic imports in world trade fell to 0.2% in 2023, which is also half the level of 2014. The aggressive expansion of commodity imports has led to a significant deformation of the domestic commodity market, causing the decline of key industries and a critical accumulation of the trade deficit: -2.9% of GDP in 2014, -12.8% of GDP in 2023. Analyzing the state of Ukraine's foreign trade relations in 2014-2023, it can be concluded that Ukraine's commodity trade with the EU member states retains its potential.

The current globalization of trade processes presents a number of challenges for Ukraine, related to the search for new sources of competitiveness and the creation of new economic partnerships, in cooperation with which our country could accelerate the modernization of the national economy. Russia's war has caused problems for exports, brought about new economic aspects of such a war, and necessitated new comprehensive economic deterrence measures and tools to counteract aggression. This problem is exacerbated by the need to reconsider the concept of ensuring Ukraine's economic security in the context of military aggression unleashed since 2014. The deterioration of the socio-economic situation in our country caused by the war with Russia, the pandemic, and the unfavorable external environment have led to a decrease in Ukraine's foreign trade. In 2022, Ukrainian business exported goods worth USD 44.1 billion. This is a third less than in the previous year. In the year 2023, Ukraine encountered a significant shortage of goods amounting to more than USD 26 billion owing to logistical challenges and defense requirements. In 2023, our country mainly exported the following groups of goods: cereals (18.5%), fats and oils (13.1%), and ferrous metals (12.7%). Ukraine mainly imported the following categories of goods: fuel (mineral - 17.2% and nuclear 8.1%), means of land transport (10.8%), electrical machinery, equipment, and parts thereof (9.4%), plastics, polymeric materials and products thereof (6.1%).

Economic instability as an environment for the formation of neo-protectionism

According to analysts (World Bank, 2023), trade liberalization in the period 1990-2008 allowed for the intensification of international trade relations and increased the incomes of countries. This process contributed to the formation of the global economy and reduced poverty in many countries.

The current state of international trade is characterized by increasing transformations in commodity market relations and the phenomenon of neo-protectionism. Many scholars have studied the development of international trade in the context of neo-protectionism (Zalizniuk, 2024; Kaliuzhna, 2023; Abboushi, 2010; Lang, 1984; Mazaraki & Melnyk, 2019). Based on the analysis of the works of these scholars, several main conclusions can be drawn. Firstly, protectionism (Hager, 1982) is a means of ensuring state autonomy in the spheres of national production from unauthorized competitive actions. This statement implies that neo-protectionism provides advantages for the state trade and export sector to increase the state budget and improve the situation of commodity producers in a given country (Lang, 1984). Secondly, according to research by scholars (Zalizniuk, 2024; Ishchuk, 2021), neoprotectionist tools include the establishment of different quality standards for foreign producers, the introduction of additional export restrictions, and rules for granting subsidies.

Third, neo-protectionism manifests itself in a variety of ways, in different areas: environmental, integration and disintegration, trade in goods and raw materials, customs and tariffs, fuel, and others. Fourth, the trade war is one of the manifestations of neo-protectionism. Although it has a negative sound, the restriction of exports of certain groups of goods and services by states associated with trade giants is a means of weakening competition in international trade and at the same time is an incentive for national producers. In turn, this causes the development of innovations within the framework of national development strategies.

Strategic Determinants of Ukraine's Foreign Trade in the Postwar Period

The development of the global economic system and its subsystems at different levels (countries, economic sectors, enterprises) is taking place in the context of increasing globalization and international strategic partnership. There is a need to review and improve international integration processes. Growing global and regional competition, intensifying rivalry for markets and resources pose new challenges, but also opportunities for the emergence of new joint associations at different levels.

Today, the priority in Ukraine is to save the population and restore the country's economy to a healthy state. Russia's invasion has shown which countries have become our partners and will continue to be so. Most of the world (140 out of 184 countries) condemn Russia's aggression and are trying to reduce trade ties with it. This gives Ukraine an opportunity to increase its exports.

The selection of priorities is essential for a consistent and sustainable transition to the conditions of operation defined by the Association Agreement and the establishment of a deep and comprehensive free trade area. In the current state of political, economic, and social crisis, a novel paradigm for the advancement of the nation, society, and individuals is being established. In view of Ukraine's European integration, the following priorities are set for foreign trade

- accelerating and maintaining the sequence of reforms, taking into account changes in political and economic relations;
- increasing financial and technical support from the EU, fulfilling the conditions for increasing the level of transparency of cash flows and the efficiency of their use;
- improving partnerships with non-European countries.

The first direction is acceleration of strategic reforms includes the following provisions:

- identify and accelerate institutional transformations related to the business environment;
- to facilitate relations between business communities in the EU and DCFTA countries;
- ensure the consistency of reforms aimed at addressing the problems of competitiveness of Ukrainian products and their access to markets.

The second area is to increase the EU's financial and technical support for the fulfillment of cooperation and reform conditions. According to the Pulse of the Agreement resource, 3 billion euros were planned to be allocated in 2022 to help Ukraine implement reforms to join the EU (Laptiev & Sidak, 2019). Under the Horizon Europe program, Ukraine will receive additional funds for grants and research (Horizon Europe, 2024).

The EU-Ukraine Association Agreement has a significant impact on Ukraine's pursuit of its interests in the context of globalization. As a supplement to the DCFTA, the Agreement

has contributed to the formation of trade preferences and an increase in tariff quotas for key export items. Accordingly, the share of foreign trade turnover with the EU increased significantly from 21.6% (in 2020) to 44.8% (in 2021), in exports from 32.1% to 39.8%, and in imports from 33.6% to 44.6%. In 2022, the share of EU exports in total exports from Ukraine was 63%, and in 2023 - 62.7%.

Increasing trade with the EU is fully in line with Ukraine's national interests. This has determined the main vectors of economic, technological, and innovation progress that led to Ukraine's accession to the EU's "four unions": energy and customs unions, the introduction of the digital market, and the association with the Schengen area.

The largest volumes of foreign direct investment (FDI) were invested by non-residents from EU countries. This facilitates the movement of investment and credit capital. In 2021, FDI in Ukraine's economy amounted to USD 6.747 billion. Most FDI came from the Netherlands is USD 922.8 million and Germany is USD 242.9 million. At the same time, Investors from Switzerland returned USD 112.7 million of investments, and USD 83 million was withdrawn from Ukraine by Cyprus. Prior to that, Cyprus was the largest source of foreign investment in Ukraine.

Most investments came from the following countries: Cyprus, the Netherlands, the United Kingdom, Germany, France, and Austria. This was facilitated by the adoption of the Law of Ukraine "On the Regime of Foreign Investment." However, as of today, the volume of foreign investment has declined significantly due to Russian intervention. In 2022, the volume of foreign direct investment in Ukraine amounted to USD 1,152 million.

However, integration and globalization processes have a number of challenges in addition to their benefits. Macroeconomic threats include increased political and economic dependence, accelerated changes in market conditions, and increased competition for sources of raw materials and markets. This process is based on the uneven socio-economic, technical and technological development of different regions.

Ukraine has chosen the path of European integration, which requires balanced changes and transformations in many aspects of public life. The main challenges today are: the unsatisfactory efficiency of the governance system in Ukraine, certain complications within the EU, Russia's war against our country, and the consequences of the Covid-19 pandemic. At the same time, we can feel the EU's support in this difficult time for Ukrainians, as evidenced by the launch of the EU candidate status procedure.

For successful cooperation with the EU, Ukraine should work in the following areas:

- updating the Agreement to liberalize the conditions for mutual trade;
- changes in product certification in accordance with EU legislation;
- creation of a common aviation area;
- deepening cooperation in science and technology;
- cooperation in the healthcare and pharmaceutical sectors;
- increased business collaboration and employment.

The third direction is to build up strategic partnerships with non-European countries: the United States, Turkey, China, Israel, and Japan. These countries are powerful technological and financial centers.

As the events of the last year have shown, in the military-political and economic spheres, it is important to build a strategic partnership with the United States. This supports Ukraine in its efforts to integrate into European and North Atlantic structures. Currently, Ukraine receives perhaps the largest financial assistance from the United States, especially through the Pentagon's military aid. In recent years, cooperation in the IT, agricultural, energy, and military sectors has increased. At the same time, the volume of investments in Ukraine's economy and Ukrainian exporters' access to the American market has increased. Ukraine has been perceived as an outpost of democratic states, but not all-American politicians understand this.

Most Asian countries have great potential for partnerships. China, Japan, and South Korea are friendly partners for Ukraine. Over the past decade, China has been Ukraine's second-largest trading partner. Our country closely cooperates with China in agriculture, medicine, and electronics. China buys grain, meat, and meat products from Ukraine, for which it has introduced its own certification of Ukrainian agricultural products. Among Asian countries, Turkey is worth mentioning. In recent years, Turkey's role as both a political and economic partner of Ukraine has grown significantly. To this end, a free trade agreement was signed, and cooperation in the military-technical and defense-industrial sectors was established.

To study the possibilities of realizing Ukraine's export potential in the EU and Asian markets, we calculated the relative comparative advantages in the structure of exports and imports by commodity groups using the formula:

$$CA_{ij} = \ln \left[\frac{\frac{Ex_{ij}}{Im_{ij}}}{\frac{Ex_i}{Im_i}} \right],$$

Where CA_{ij} is the indicator of the comparative advantage of the i -th country for the j -th product;

Ex_i, Im_i - exports and imports of the i -th country;

Ex_{ij}, Im_{ij} - exports and imports of the j -th product of the i -th country.

If $CA_{ij} > 0$, then for the j -th product it means that the i -th country has a comparative advantage in exports to other countries. If $CA_{ij} < 0$, it means that it is not advisable for Ukraine to export this product (Mazaraki, 2019, p. 360).

Calculations of the comparative advantages of Ukraine's commodity groups in 2017-2021-(Zubko, 2022). It has been determined that in Ukraine, among the 96 product groups listed in the nomenclature, only 28 have comparative advantages and so far only they are expedient to sell on the world market. The highest coefficient of comparative advantages in 2021 is observed in the following product groups: cereals (4.38), ore, slag, and ash (3.03), fats and oils of animal or vegetable origin (2.83), plant materials for the manufacture of wickerwork (2.55), ferrous metals (2.27), natural and artificial fur (2.14), products of plant origin (2.05), wood and wood products, etc. As of 2022 and 2023, the situation has changed, with the following commodity groups having comparative advantages: cereals (4.69), ore, slag, and ash (5.63), plant materials for the manufacture of wicker goods (4.28), and products of the flour and cereal industry (2.45). This calculation provides the basis for determining the product groups that are economically feasible for export.

The leaders in export value in 2022 were: corn (USD 5.94 billion), sunflower oil (USD 5.46 billion), iron ore (USD 2.9 billion), wheat (USD 2.6 billion), and rapeseed (USD 1.54 billion). Therefore, it is advisable to increase exports of those commodity groups that have greater comparative advantages and higher added value.

To identify problems and directions for the development of export potential, we have analyzed the volume of imports from the EU-27 and Asia in 2020-2023 by commodity groups (according to Ukraine's code) in value terms and Ukraine's comparative advantages in each of these markets. The share of exports from Ukraine to EU countries and the coefficient of comparative advantages of Ukrainian exports are shown in Table 2.

Table 2

Share of exports from Ukraine to the EU and the coefficient of comparative advantage of Ukrainian exports

Code and name of the product item	Ukraine's share of EU imports, %				CA _I s of Ukraine in the EU market, units.			
	2020	2021	2022	2023	2020	2021	2022	2023
10. Grain crops	9,46	10,13	7,2	7,7	3,84	4,28	3,2	3,0
26. Ores, slag, and ash	7,69	8,2	4,1	2,6	2,3	2,93	1,7	1,4
15. Fats and oils of animal or vegetable origin	9,80	10,2	5,1	2,3	2,9	2,73	1,6	1,5
14. Plant materials for the manufacture of wicker products	0,24	0,23	0,2	0,1	4,09	2,45	2,0	1,7
72. Ferrous metals	13,32	14,2	2,1	0,5	1,88	2,17	1,8	0,3
43. Natural and artificial fur	0,11	0,11	0,08	0,05	1,63	2,04	0,78	0,66
12. Seeds and fruits of oil seeds	6,65	7,2	4,2	4,0	1,44	1,66	1,4	1,2
23. Residues and waste from the food industry	2,48	2,51	1,7	0,6	1,62	1,58	1,2	1,05
44. Wood and wood products	5,25	5,8	5,1	4,1	1,41	1,51	1,4	1,4

The following groups had the largest share in the volume of imports to the EU in 2022-2023:

1. Cereals in 2021 amounted to 10.13%. In 2022, grain exports from Ukraine were limited to 500 thousand tons per month due to Russia's invasion, which is ten times less than the pre-war volume. This season, the volume of exports from Ukraine will decrease. The balance of grain to be exported, according to the Ministry of Agrarian Policy, was 17 million tons. This included 10 million tons of corn, 6,700 thousand tons of sunflower and its products, and 730 thousand tons of soybeans. At the end of 2022, these products were exported. The government has established new rules for the export of agricultural goods, in particular, it is forbidden to export: oats, millet, buckwheat, sugar, salt, rye, cattle, and meat of domestic animals. This means a de facto export ban. The following can be exported under the specified declarative licensing: wheat and a mixture of wheat and rye, corn, chicken meat,

chicken eggs, sunflower oil (www.ukrstat.gov.ua). However, grain crops are not final products and have no added value. Ukraine's exports are focused on raw materials, the markets for which are not stable and cannot generate significant profits.

2. In 2021, Ukraine exported vegetable oils (sunflower, soybean, rapeseed, mustard, linseed), margarine, and products from vegetable and animal fats and oils, as well as animal fat, for USD 7.05 billion. This is 22.2% higher than in 2020. Exports of sunflower oil in 2021 amounted to 6.05 billion USD. This is 90.8% of the total revenue in this product group. Soybean and rapeseed oil were also supplied to foreign markets — by USD 0.29 billion (4.1%) and USD 0.29 billion (4.1%). USD (4.1%) and USD 0.22 billion (3.2%), respectively. USD (3.2%), respectively. In 2021, margarine and products from vegetable and animal fats and oils were exported for USD 87 million (2%). USD (1.2%), and pork and poultry fat by USD 14.5 million (0.2%) (Zubko, 2022). In 2022, sunflower oil was exported for 5.46 billion USD. USD, which was slightly less than in 2021.

3. Exports of seeds and fruits of oil seeds in 2020 amounted to 7.42%. There was an increase in this indicator during the entire study period, before the start of full-scale aggression. In 2022, rapeseed seeds and cake were sold for USD 1.54 billion. This is less than the pre-war level (in 2021 1.67 billion USD).

4. Exports of ferrous metals in 2021, according to the State Customs Service, increased by USD 6.3 billion. (+81.4%) to USD 13.96 billion on the world market. The company's share of the global market is up to USD 96 billion. Customs statistics show that the revenue of Ukrainian metallurgical enterprises from the export of ferrous metals in January-November 2021 increased by 81% compared to January-November 2020, to USD 12.62 billion. However, in 2022, this figure dropped to almost zero for obvious reasons.

5. Exports of ore, slag and ash to the global market increased by USD 2.98 billion. (+77%) to USD 6.9 billion in 2021. USD in 2021. Price pressure in the iron ore markets prevents significant profits from the sale of this product. In 2022 and 2023, trade in these products decreased by 90%. In 2022, Ukraine received USD 2.9 billion for the sale of iron ore.

6. Exports of wood and wood products in 2021 amounted to 5.8%. The situation in 2022-2023 also affected this product, as the share of exports decreased significantly.

An analysis of Ukraine's merchandise exports to the EU shows that most of these goods are not final products and are used for intermediate consumption. Accordingly, all these items do not create significant added value, and this confirms the current focus of Ukraine's exports on raw materials.

Table 3 calculates Ukraine's share of Asian imports and the coefficient of relative comparative advantage of Ukrainian exports. Ukraine's main trading partners in Asia are China, India, Turkey (97% of the country's area is in Asia and 3% in Europe), Indonesia, and Saudi Arabia. In 2021, the shares of some commodity items changed.

Table 3

Share of exports from Ukraine to Asian countries and the coefficient of relative comparative advantage of Ukrainian exports in the Asian market

Item code and name of the	Ukraine's share in Asian	CA _{ij} of Ukraine in the
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STRATEGIES FOR THE DEVELOPMENT OF INTERNATIONAL TRADE IN UKRAINE

product	imports, %				Asian market, units.			
	2020	2021	2022	2023	2020	2021	2022	2023
10. Grain crops	24,33	18,56	6,7	6,5	3,87	4,25	2,56	1,46
26. Ores, slag, and ash	15,3	8,30	0,54	0,34	2,32	2,9	1,25	1,15
15. Fats and oils of animal or vegetable origin	16,98	3,52	4,80	2,0	2,93	2,7	2,8	2,8
14. Plant materials for the manufacture of wicker products	0,001	0,003	0,2	0,2	4,12	2,42	3,14	2,14
72. Ferrous metals	14,63	36,24	0,64	0,01	1,91	2,14	1,99	0,69
12. Seeds and fruits of oil seeds	1,81	3,55	1,1	0,8	1,47	1,63	1,7	1,7
23. Residues and waste from the food industry	4,51	4,38	1,3	1,1	1,65	1,55	1,2	1,39
44. Wood and wood products	1,88	1,67	0,49	0,34	1,44	1,48	1,4	1,2
02. Meat and edible offal	1,81	0,6	0,51	0,33	1,28	1,32	1,51	1,51
11. Products of the flour and milling industry	0,58	0,31	1,23	1,24	1,39	0,86	1,69	1,69
28. Inorganic chemical products	0,623	1,675	0,03	0,8	0,82	0,77	0,68	0,68

The following items account for the largest share of imports in the Asian market:

1. Exports of ferrous metals amounted to 36.24% in 2021. In recent years, the share of ferrous metals in total exports of goods to the Asian market has increased 22 times. As can be seen from Table 3, Ukraine has currently reduced the exports of this item.

2. The volume of grain exports in 2021 was 18.56%. In 2021, the turnover of trade in agri-food products between Ukraine and Asia increased by 22% compared to the previous year's figures for the corresponding period and reached \$ 10.8 billion. At that time, the largest volumes of exports in the Asian direction were made to Pakistan, South Korea, Thailand, Israel, Bangladesh, Indonesia, Jordan, the Philippines, and Yemen. Among the largest consumers of barley in Asia are Saudi Arabia (70% of total exports), Turkey, Iran, and Israel. The high demand for barley in the Middle East is primarily due to its use for feed, including for camels in the Arabian Peninsula. The Asian market is the second-largest buyer of corn in Ukraine. In 2023, this figure decreased to 6.5%.

3. The volume of trade in ore, slag, and ash in 2021 was 8.3%, and in 2022 and 2023 this figure decreased significantly.

4. Exports of food industry residues and waste in 2021 amounted to 4.38%. This group of exports includes waste and residues from starch production, beet pulp, soybean, sunflower, rapeseed, flax, beer production waste, etc. These residues and wastes are used in the production of animal feed, fertilizers, and as raw materials in chemistry and pharmaceuticals.

5. The export volume of the item "Fats and oils of animal or vegetable origin" in 2021 was 3.52%. During 2020-2021, there was a significant decrease in this indicator (from 16.98% in 2020 to 3.52% in 2021). Comparing this indicator in 2022 and 2023 with the previous ones, there is a significant decrease.

6. Exports of seeds and fruits of oil seeds were at 3.55% in 2021 and 2.1% in 2022. High economic growth rates and an increase in the population of middle-income Asians are

leading to an increase in the consumption of food products of both plant and animal origin. This indicates the prospects for expanding the market for Ukrainian agricultural products (Official site of the State Statistics Service of Ukraine, 2024).

This analysis makes it possible to identify the shares of domestic export commodity groups that are currently sold in the EU and Asian markets, compare them with the values of relative comparative advantages, and identify the most priority commodity groups of Ukraine's exports to the EU and Asian markets.

Given the war, Ukraine's export opportunities are severely limited.

For developing economies, including Ukraine, low global commodity prices pose significant challenges. Under such conditions, global trade and investment will not grow. At the same time, as the share of middle-income people in Asia and North Africa increases, consumption of both plant and animal food will rise. This opens up significant prospects for expanding the market for domestic agricultural products.

As of 2022, there have been many innovations in EU phytosanitary regulations. Ukraine has prospects for increasing the flow of agricultural products to the EU, only if it complies with them. Cooperation with China, which has simplified phytosanitary protocols for agricultural products, is also promising. Ukrainian farmers can export corn, soybeans, barley, and sunflower oil to China. It is necessary to expand the range of goods and services that can be supplied to this country. In addition to the Chinese market, the markets of Japan and South Korea are of great interest to Ukraine in the Southeast Asian region. Due to the practical unsuitability of their territories for growing grain, demand for agricultural products will be high. The prospects for Southeast Asia are complemented by the high potential for suppliers of oil seeds and fruits.

The attack on Ukraine in February 2022 and Ukraine's focus on EU accession have led to a redistribution of export commodity groups, as well as to the emergence of challenges and benefits of the European integration process. Accordingly, the indicators for assessing it have changed. As of today, Ukraine's export opportunities are significantly limited. Comparing the state and opportunities for foreign trade in 2021 and 2023, it is clear that Ukraine's economy is only partially able to export commodity products. According to Forbes Ukraine magazine, in January-August 2023, Ukraine exported goods worth \$24.5 billion, of which the budget received UAH 465.8 million as a result of export duties. Exporters received 15% less revenue compared to the same period in 2022 (\$28.9 billion) and 41% less compared to \$41.8 billion in the first eight months of 2021. The decline in revenue in 2023 is due to the fact that in January and February 2022, before the full-scale invasion of Russia, Ukrainian exports were record-breaking. Comparing the six-month period from March to August, exports in 2023 grew by 2% compared to the same period in 2022 (Hvozdeva, 2023).

The most important categories of goods from Ukraine in the first eight months of 2023 are:

- food (\$14.6 billion)
- Metals and metal products (\$2.7 billion)
- machinery, equipment, and transport (\$2.1 billion).

Exports of agricultural products are five times higher than exports of metallurgical goods, although for decades they have been quite equivalent channels for bringing foreign exchange earnings to Ukraine.

Also, such commodity groups as mineral products, chemicals, and wood are insignificantly represented in exports. In fact, Ukraine is present on the export market as a country that trades in food. The other items listed above continue to decline, as most of the territory is either occupied or unable to function economically at the proper level.

The situation can be improved by investments of friendly countries in innovations and development of Ukrainian industry, and the end of the war.

CONCLUSIONS

Ukraine's foreign trade has been dynamically reoriented toward European markets and new logistics routes, which has significantly eased the restrictions imposed by the aggressor's blockade of Black Sea ports. This was facilitated by the decisions of the EU and a number of other important trading partners to liberalize access for Ukrainian goods, as well as important decisions to improve the transportation of Ukrainian goods through the EU. Ukraine has taken influential steps to restart the work of its export credit agency.

The main determinants of the negative impact on Ukraine's trade are: the war with Russia, lower prices on global commodity markets, the raw material orientation of our country's exports, the lack of political and economic reforms, the decline in the purchasing power of the population. And the epidemics that have accompanied our lives over the past decade. The redistribution of levers of influence in the global arena continues, which increases uncertainty and complicates any decision-making in the economy. Priority areas of action for Ukraine's foreign trade have been identified: accelerating reforms, increasing requests for financial and technical support from the EU, and strategic partnerships with non-European countries.

Ukraine should work in all the proposed areas, taking into account the advantages and challenges of each. The main direction is conditioned by the signing of the Association Agreement and involves continuing reforms and adjusting the provisions of the Agreement to correct the asymmetry of trade flows that has developed at this time. Changes in the Agreement will allow Ukraine to supply goods with more added value than raw materials to the world markets.

Another direction is also already available in Ukraine through the Horizon Europe program and provides opportunities to increase the country's innovation potential and, accordingly, trade flows in the future.

The article identifies the possibilities of realizing Ukraine's export potential in the EU and Asian markets by calculating relative comparative advantages by product groups. It is established that trade with the EU does not provide significant benefits for Ukraine, since most export items do not create sufficient added value. Accordingly, it is necessary to correct the deformation of the commodity structure of exports and imports from the EU. The study of the comparative advantages of Ukrainian exports in the Asian market identified those commodity groups that have prospects for development, such as plant materials, natural and artificial fur, ships, lead and lead products, meat and offal. These commodity groups have a slightly higher added value than those currently sold. The findings will be used to substantiate state policy to support national producers of higher value-added products in order to create conditions for the formation of new and joining existing global value chains, which should significantly increase the level of economic security of Ukraine's trade.

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WASTE MANAGEMENT IN THE CONCEPT OF GREEN RECONSTRUCTION OF ECONOMY

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Abstract: *The article defined the concept of waste management in the environmental management system. The research analysed the problems of waste management in the environmental management system from point of view by a number of domestic and foreign scientists. As a result, authors outlined the basic components of waste management: strategic planning, prevention of environmental pollution, conservation of resources, minimization of the amount and toxicity of waste generation, choosing the best prevention option, assessment of effects and consequences, decision-making. The research described the system of green reconstruction of economy and formed the basic principles of the green post-war reconstruction that would provide sustainable economic development. The article outlined the concept of post-war green reconstruction which should focus on such areas as: sustainable construction and resource saving; implementation of renewable energy sources; sustainable development of infrastructure; implementation of a waste management system, minimization of residues. The authors grounded five main stages of waste management process under post-war reconstruction of Ukraine: prevention of waste generation, preparation for reuse, processing, other uses, disposal. Sustainable waste management solutions are essential to maintain environmental harmony but, also, they are linked with cost, public response, political constraints, and social norms. Consumers' environmental awareness influence the demand for goods and services and thus reduce the amount of waste. Research argued that local communities should developed own waste prevention strategies and attract environmentally conscious businesses to their territory. State policy should focus consumers for preferring products in packaging/container that is suitable for recycling or reuse (glass), paper bags, eco-bags, used appliances.*

Keywords: *circular economy, green economy, green reconstruction, sustainable development, waste management*

INTRODUCTION

Post-war reconstruction and recovery in Ukraine are projected to cost \$490 billion over the next decade. The government has identified a number of regions and branches where

reconstruction will be comprehensive and based on new principles. The base of this principles is the environmental responsibility. The approach of green reconstruction of economy is the base of sustainable development and will strength the economic convergence of Ukraine with EU. Same time, when we think of environmental development and green investment we think about waste and its disposal in a landfill. Such case actualizes the concept of waste management which combines various actions taken and plans created to manage waste, from composting or recycling existing waste to minimizing the production of waste in the first place. Waste management refers to both public service providers and private companies that handle waste from the time it is discarded to the time it is managed. The concept of waste management is the basic approach in the implementation the model of green economy reconstruction.

Concept of waste management in the environmental management system

Inefficient waste management, from non-existent waste collection systems to inefficient waste disposal, leads to air, water and soil pollution. Open and unsanitary landfills contribute to the contamination of drinking water, cause infections and spread diseases. The problem is quite relevant for developing and low-income countries. The accumulation and dispersion of garbage pollutes ecosystems, and hazardous substances from e-waste or industrial waste harm the health of city dwellers and the environment. This problem actualizes the problem of waste management at the global level and requires the development of integrated solid waste management systems.

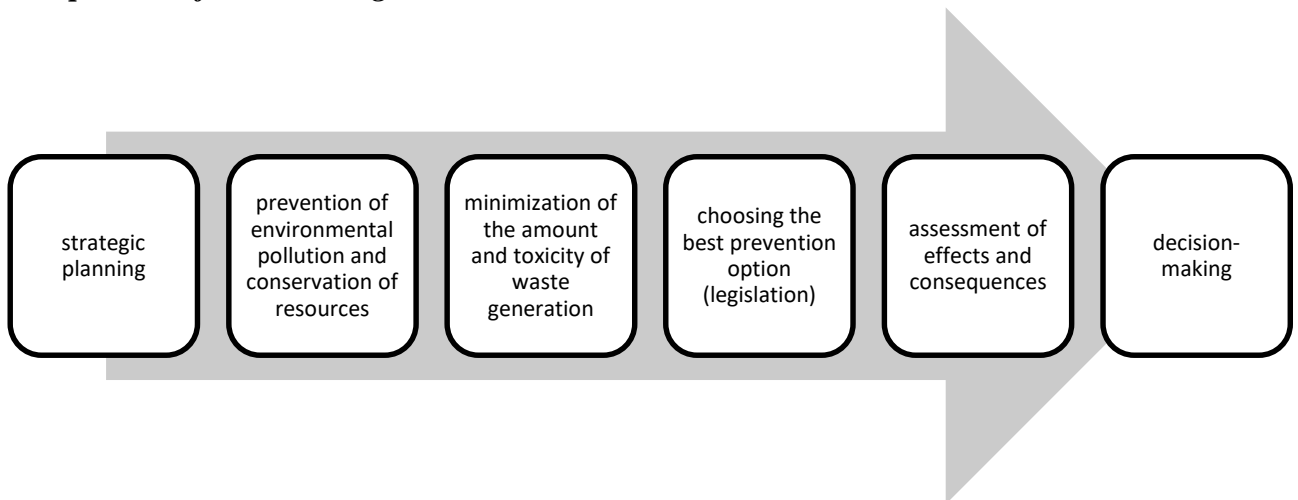
Problems of waste management in the environmental management system were considered by a number of domestic and foreign scientists. In particular, researchers (Khan et al., 2022) studied that solid household waste is a reflection of the culture that generates it and has a negative impact on human health and the environment. The authors concluded that the world is rapidly urbanizing and these changes impose on cities the burden of proper waste management at both social and environmental levels. Scientists (Lopez-Maldonado et al., 2022) investigated that solid waste generation has increased rapidly due to population growth in around the world, urbanization and industrialization. Scientists have found that solid waste management is a serious challenge for society, which creates local problems with global consequences, in particular, poor management can accelerate harmful environmental and socio-economic problems. Researchers (Kharola et al., 2022) identified barriers to organic waste management decisions from the subject's point of view and studied their causal relationships to overcome the problem of organic waste management from a systems perspective. The study identified key issues in organic waste management and noted that incentives and increased attention to waste is an effective approach to solving the problem, and that waste collection fees, environmental behaviour and obligations influence consumer and household decisions.

Effective management of waste, which will be used as a resource in the future and play an important role in achieving environmental sustainability and the transition to a circular economy (Tanveer, Khan & Umar, 2022). The authors identified the following categories: e-waste, transition to a closed-loop economy, plastic waste, bio-based waste disposal, life cycle assessment and environmental impact, as well as construction and demolition waste disposal. Scientists have developed conclusions for politicians, specialists and practitioners regarding waste management and technological innovations towards a circular transition. Waste

management theory is a conceptual description of waste management that defines concepts related to waste and proposes a methodology for waste management. The theory of waste management is based on the hypothesis that sustainable waste management largely depends on the definition of the category "waste". The concept of "waste" is related to a person and his life activities. Populations, households and economies depend on constant flows of air, water, food, raw materials and fossil fuels. Waste is constantly generated or released into the air, dumped on/into the ground. The concept of "technical inefficiency" is closest in meaning to the traditional use of resources and generation of waste. "Technical inefficiency" means that managers of an organization fail to minimize costs or maximize output because they are not using the best available technology (Zvarych & Rivilis, 2023).

The European Council Waste Directive defines waste management as: collection, transport and disposal of waste, including supervision of disposal sites and aftercare. That is, from the definition, it follows that waste management is only the process of manipulating unnecessary materials, and waste management is an activity on these materials. As a result, this definition does not cover all waste management activities and is therefore not sufficient. The term "management" refers to the manipulation of activities, and gives the hope that waste management will encompass more than the elimination of waste. The basis of sustainable waste management is the minimization and reduction of waste (Pongracz, 2002). As a result, it is worth noting that the waste management process also involves (see Fig. 1): strategic planning; prevention of environmental pollution and conservation of resources; minimization of the amount and toxicity of waste generation; choosing the best prevention option, taking into account the legislation; assessment of effects and consequences; decision-making.

Figure 1
Components of waste management



Source: Authors.

The "5R" waste management system covers a set of principles aimed at reducing the impact of waste on the environment. (1) Refuse unnecessary items such as single-use plastic or excess packaging. (2) Reduce the use of resources and increasing conscious consumption. (3) Reuse items or using durable goods that have a longer service life. (4) Repurpose, i.e. giving items a new purpose or using items with a long service life. (5) Recycle of used materials into

new products, reducing the need for raw materials and reducing the overall impact on the environment. In general, these principles are aimed at responsible waste management and encouraging individuals and enterprises to be more attentive to their consumption and disposal habits (Reznikova et al., 2019). The best alternative to waste disposal is to prevent its generation. This is why waste prevention is the goal of all waste management strategies. A variety of technologies can be used at the production, use, or post-use stages of a product's life cycle to eliminate waste and, in turn, reduce or prevent environmental pollution. Some representative strategies include environmentally conscious production methods, including the use of: less hazardous or harmful materials in production; modern systems for monitoring the storage of hazardous materials; innovative methods of chemical neutralization and fresh water saving technologies.

System of green reconstruction of economy

Due to of Russian aggression, Ukraine faces a many of strategic challenges. Among them is the reconstruction of critical infrastructure, providing the country's energy security, accelerated implementation of the EU legislation, climate change mitigation and adaptation to it. The war still rages on, but the country's reconstruction is already being planned. The reconstruction will comprise a lot of steps and should include planning process. There are some basic principles of the green post-war reconstruction that would provide sustainable economic development (Ecoaction, 2023):

- sustainable and systemic solutions;
- transparency; community and public participation in decision-making;
- using the best available technologies and practices;
- sustainable development of cities and regions;
- energy sector decarbonization and decentralization;
- development of sustainable and decentralized agri-food systems;
- ensuring preservation of Ukraine's ecosystems and natural resources.

Strengthening the position of the "green economy" (Mikhno, 2021) around the world determines the high scientific intensity of developments and the high level of technology of "green production", which ensure an accelerated transition to the new sixth technological order. This is what determines the background of the world economy and the competitiveness of national producers. Green reconstruction should take place taking into account a well-thought-out, differentiated and step-by-step approach to the socio-economic, production-technological and natural-geographical specifics of the business of Ukraine.

It is worth considering green reconstruction through the main structural and reproductive content of the economy in relation to the interrelated processes of production, exchange, distribution and consumption of products (goods, services), characterized by minimal resource intensity (especially non-renewable resources) and minimal negative impact on nature, in particular the volume of waste and (or) emissions in the process of production and consumption. Such a systematic approach allows us to perceive the post-war green reconstruction as a system that will have internal and external (regulatory) influences that will form direct, regular and irreversible changes in the sustainable ecological development of Ukraine (Reznikova, 2019).

Post-war green reconstruction concept

The concept of post-war green reconstruction should focus on such areas as: sustainable construction and resource saving; implementation of renewable energy sources; sustainable development of infrastructure (transport); improvement of water resources management; implementation of a waste management system, minimization of residues; rational management of land resources and control of urbanization; conservation of existing species and control of their populations (Müller, 2022). The main prerequisites forming a green economy as a necessary business model are: resources and their pricing; growth in the number of consumers among the middle class; Big data; change in legislation and globalization of management; transition from “agreement” to “relationship”. The concept of post-war green reconstruction of Ukraine should be focused on prioritizing investment and access to sustainable natural systems, infrastructure, knowledge and education necessary for population prosperity. The concept could offer opportunities for ecologically decent livelihoods, entrepreneurship and jobs (Kozak, 2022). The concept of the post-war green reconstruction of Ukraine will be based on the principle of justice, that is, the scientific development will be inclusive and non-discriminatory. The concept should outline a long-term economic vision for wealth creation and sustainability and outline measures to address the current multidimensional poverty and injustice. This approach to the development of the concept of recovery of Ukraine is innovative in the management of natural systems, because it is based on such properties as circularity, local inclusiveness and natural biodiversity (Zvarych et al., 2023).

The energy transition process for the EU will not be cancelled by either the energy crisis or Russian aggression, they may slow it down somewhat, but there are chances of its dynamic acceleration. That is, the reduction of carbon emissions into the atmosphere and the growth of carbon productivity of the economy through the involvement of the best practices of decarbonization will give a powerful impetus to the development of the energy industry, in particular, the direction of renewable and alternative energy sources. Along with this, it is important to solve the problem of waste management in Ukraine through the recycling implementation mechanism and methodical recommendations on ways to adapt existing practices of the circular economy at the stage of restoring the stability of the system in crisis conditions (war, pandemic), which will positively affect the development of the energy and agricultural industries (Bergmann & Romanyshyn, 2022).

A climate-neutral and ecologically clean economy will ensure green growth and sustainable development of agriculture through an increase in the water productivity of the economy, a reduction in waste generation, and a reduction in air and water pollution. Economic development in this way will mean ecologically clean reconstruction and reconstruction, which is achieved in an ecological way, and Ukraine will be part of the global climate-neutral economy. Building a base for green investments and green innovations, government assistance to green sectors in priority areas, creation of green jobs will have a positive impact on the economy. Green post-war reconstruction requires the use of green tools to achieve the set goals, effective mechanisms for integrating environmental issues into the decision-making process, and clear environmental conditions for the implementation of sectoral projects. The main function of the reconstruction and green reconstruction of Ukraine should be the greening of this process, the prevention of long-term negative consequences of ecological sustainable development of Ukraine, and the implementation of priority green projects in this area. In such

way, Ukraine's green reconstruction should be a sustainable reconstruction realized by the best available technologies and practices.

Waste management in the concept of green reconstruction

Implementing green reconstruction requires a combination of programme design and policy. To ensure that decentralised decision-making is guided towards green reconstruction, existing obstacles to green investment such as highly regulated wholesale market prices in the electricity sector need to be eliminated. Affordable financing is vital for green reconstruction. The costs of capital were already high in Ukraine before the war. Without affordable financing, the higher capital costs of green investments cannot be outweighed by lower operational costs. Efficient administration of green reconstruction projects is necessary. Replacing old, dirty and inefficient assets which are damaged or destroyed by the war with newer and clean technologies will generally require more sophisticated planning and construction processes that can otherwise lead to a lower speed of implementation. Private investors will be very cautious in a post-war situation, with security concerns likely not fully resolved. But they could complement and enhance the financing provided by countries and international financial institutions and improve productivity through joint ventures or more competition on previously monopolistic markets (Stubbe & Saha, 2022).

The waste management process under post-war reconstruction of Ukraine should include five main stages: (1) prevention of waste generation; (2) preparation for reuse; (3) processing; (4) other uses (eg, renewable energy); (5) disposal. Waste prevention is simple and desirable way to manage waste, and it is the first step in the waste management process (Lumenlearning, 2020). Business should act in accordance with the EU Directives on the prevention of waste generation and resort to the following methods of prevention: reducing the amount of waste; reducing the harmful impact of waste on the environment and human health; reduction of the content of harmful substances in materials and products. In Ukraine, the National Waste Management Strategy until 2030 has been adopted (Melen-Zabramna, 2018).

This reconstruction should provide for the creation of a network of centers for the implementation of clean production/technologies to minimize the volume of waste generation; adoption of legal acts on the introduction of eco-design of consumer goods, which is more suitable for reuse or disposal, by processing or reducing the use of primary raw materials. Ukraine should introduce economic mechanisms to stimulate the reduction of the amount of generated waste, such as: a tax/ban on the production of plastic bags, disposable plastic containers and tableware; preferences for manufacturers of environmentally friendly packaging for consumer goods; financial support of innovative developments in the field of product packaging design. However, citizens and businesses must be environmentally conscious and must take measures themselves to save resources, reuse things, and reduce consumption. Thus, local communities should actively work on developing their own waste prevention strategies and attract environmentally conscious businesses to their territory. Consumers' environmental awareness can influence the demand for goods and services and thus reduce the amount of waste. So, consumers may prefer products in packaging/container that is suitable for recycling or reuse (glass), paper bags, eco-bags, used appliances. That is why all subjects of economic relations should prevent the generation of waste, first of all, each subject needs to start dealing with its waste at the first stage, which will make the country cleaner and the nation healthier.

DISCUSSIONS/CONCLUSIONS

Integration of environmental and climate policy should take place in all sectors, which requires taking into account the provisions of environmental and climate policy in strategic and programmatic documents in all spheres and levels of public life. The priorities of the European Green Deal (EGD) should become the key tasks of Ukraine's post-war recovery. Such key tasks include: decarbonization and modernization of the economy, preservation of biodiversity, clean industrial production and the transition to sustainable agriculture. Green reconstruction should contribute to the sustainable development of Ukraine. That is why the recovery of the economy requires that the goals of sustainable development be aligned with the investment policy. And the financing vectors should be directed primarily to the development of production chains with high added value, displacing the resource-export economy.

Ukraine's green economy should be: low-carbon, energy-efficient, nature-oriented, efficient and clean production, balanced consumption. The green economy should be based on the following principles: shared responsibility, innovation, cooperation, solidarity, flexibility and interdependence. Development should empower the national economy and provide better choices through targeted and appropriate fiscal policies. Economic development should be sustainable and ecological and oriented towards climate goals, environmental protection policy and social protection policy. The reconstruction programme must be designed to favour long-term efficiency over initial investment costs to encourage investment in green technologies. International donors and IFIs will need to play a vital role and their concerns must be taken seriously in designing the institutional framework of reconstruction. To avoid stalling or impeding the green reconstruction, effective and fast project management and implementation processes are needed. The availability of investment insurance, covering relevant risk categories such as military risk, will be a necessary precondition to attract any investment.

Green reconstruction economy model should focus on approach that, waste should be recycled through effective treatment methods to recover materials and minimize the hazardous impact on environment. Sustainable waste management solutions are essential to maintain environmental harmony but, also, they are linked with cost, public response, political constraints, and social norms. Sharing knowledge and implementing advanced technological know-how to manage waste and post-consumption processing is mandatory for implementation the model of green reconstruction of economy and investment into future generations.

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CONSIDERATIONS ABOUT VOLUNTEERING AND ITS IMPORTANCE

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Abstract: *Volunteering, as defined, is an activity carried out voluntarily by an individual, without expecting directly or implicitly a financial reward or goods. It plays an important role in democratic societies, often being a form of social inclusion and integration, contributing to the development and implementation of state policies, and being an instrument for promoting social cohesion. "Volunteering is the best example of democracy. We vote in elections, but when you volunteer, you vote every day for the community in which you want to live." - Marjorie Moore.*

Keywords: volunteerism, involvement, organizations, international law, war, society, democracy.

INTRODUCTION

The concept of volunteerism, in the modern form as we know it today, developed mainly in the 19th century. Its emergence was based on the social and economic changes of that period, as well as philanthropic and humanitarian movements. Essentially, volunteering has always existed because people all over the world have offered to help their fellow human beings. In other words, with the appearance of human communities, that altruistic spirit that exists within each of us also appeared and manifested itself, urging us to help our fellow human beings, selflessly, without expecting anything in return.

The term volunteering was first used in the 17th century in the military sphere. More precisely, it referred to individuals who were enlisted in emergency military service and were not paid for their services, these individuals were called volunteers.

Volunteering in its modern form emerged in the 20th century, when the first international volunteer organizations appeared, such as the Peace Corps in the USA (established in 1960) and Voluntary Services Overseas (established in 1958) in the UK. The role of these international organizations was to train members of national organizations on various issues related to organizational management, providing them with consultancy and advice. Relying on the support of these organizations, volunteer centers began to progress and develop. Since then and to this day, the Peace Corps plays a crucial role in the development of volunteering at a global level, being the largest provider of volunteers in the world.

Today, volunteering and international volunteer organizations play an essential role in achieving sustainable development goals, addressing issues such as poverty, education, and climate change.

In terms of regulations, international law recognizes volunteering through various instruments that emphasize its importance for social, economic, and cultural development.

These instruments include numerous documents and initiatives, conventions, resolutions, and declarations adopted by international organizations such as the United Nations or the European Union, promoting cooperation between states and international organizations to support and encourage volunteer activities.

Whether we are talking about interpersonal relationships or international cooperation between states, volunteer work helps strengthen social ties and build a more united and resilient community.

Considerations about volunteering and its importance

Volunteering has significant importance in a democratic society. It plays a decisive role in supporting and promoting democracy and in strengthening it. Starting from the statement of the American writer Marjorie Moore who said: "Volunteering is the best example of democracy.", we can say that volunteering breathes life into the noblest principles of democracy - freedom, peace, justice, security, advocating for their respect and enforcement.

Considering the social and economic aspects that the world is facing, volunteering represents an essential element of all societies, a status attributed also by the declaration of the United Nations adopted on December 10, 1948, which states that: "We, the people, have the power to change the world." To bring about change, one must take action, and volunteering is the best way to act and get involved, so that you can put your ideas into practice and produce change. Additionally, volunteering is the simplest way to offer your energy and knowledge for the benefit of others and the community to which you belong.

Today, volunteering has become an important element in democratic societies, and the famous statement from the United Nations (UN) declaration has transformed into concrete actions of volunteer associations, thus gaining a global character, an example in this sense being the international organization Greenpeace, present with volunteers in over 55 countries, advocating for resolving environmental issues and adopting policies that combat pollution, abuse of water, land, and at the center of their actions a message of peace.

Every year, on December 5th, International Volunteer Day is celebrated, a day that honors volunteers and their work; it was adopted by the United Nations General Assembly on December 17, 1985. This day is a recognition of the contribution volunteers make to achieving numerous development projects at the local, national, and international levels, and an opportunity to encourage more people to get involved in volunteering activities in a global effort to make the world a little better.

According to the United Nations Volunteers (UNV) report from 2018, approximately 1 billion people worldwide were involved in volunteer activities, making volunteering one of the most widespread social activities. Volunteer activities contribute 2.4% to the global GDP, according to estimates from the International Labour Organization (ILO), and also contribute to developing skills and increasing the employability of those involved, providing them with practical experience and networking opportunities. Another role that volunteer organizations play is providing social and economic services, often filling the gap left by government resources, especially in underdeveloped countries.

Promoting and supporting volunteering have been and remain important objectives for national governments, international organizations, and communities around the world. One such initiative is the European Solidarity Corps, supported by the European Union since 2016,

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when it was announced by the then President of the European Commission, Jean-Claude Juncker (President of the European Commission from 2014 to 2019), in his State of the European Union speech.

Officially launched in 2018, the European Solidarity Corps has become a strategic instrument for the European Union in engaging with the young generation. In 2021, it was allocated a budget of over 1 billion euros, available for the period 2021-2027. This budget is dedicated to volunteer projects aimed at young people aged between 18 and 30, providing opportunities for at least 270,000 volunteers.

Regarding Romania, in a study published by the European Solidarity Corps in 2019, it ranked 3rd, after France and the United Kingdom, old democracies, in terms of the number of participants in volunteer projects and it ranks 7th in terms of solidarity projects.

From a financial allocation perspective, in the period 2018-2020, over 11.5 million Euros were allocated and nearly 300 volunteer, solidarity and professional experience projects were funded, involving over 3500 Romanian young people.

In an increasingly tense international context against the backdrop of the war in Ukraine or the Israeli-Palestinian conflict, volunteering and volunteers play an important role in refugee camps and post-conflict reconstruction, contributing to the defense of human rights, international stability and security, as well as to reducing the effects caused by war. With the support of the United Nations (UN), which carries out the United Nations Volunteers (UNV) program, thousands of volunteers are currently on humanitarian missions and in war camps around the world. Even if there is war in these regions, there are agreements and conventions that support the access of volunteers, these agreements and conventions make up International Humanitarian Law, an important part of Public International Law.

International humanitarian law encompasses rules that, during times of war, are intended to protect volunteers and individuals who are not taking part in the conflict, and to limit the means and methods of war used. The foundations of this branch of public international law are constituted by the Geneva Conventions of August 12, 1949, and the Additional Protocols of 1977, to which a third additional protocol was added in 2005.

An explicit provision of International Humanitarian Law is that its norms apply to all types of conflicts and must be respected by all parties involved. Additionally, states have an obligation to sanction the violation of these norms and to criminally prosecute those who have violated them by committing serious violations, such as war crimes, and must also collaborate with other states for this purpose.

One of the bloodiest conflicts of the last century, the Battle of Solferino (June 24, 1859) in northern Italy, where the armies of France and Austria clashed, was an intense battle that lasted 16 hours and resulted in over 40,000 dead and wounded. This battle gave rise to one of the most important international volunteer organizations - the International Red Cross and Red Crescent Movement. The initiator of this movement was the Swiss businessman Henry Dunant (1828-1910), who drew international public attention to the necessity of establishing a society that would provide assistance and promote an international agreement regarding the care of the wounded and those who care for them.

Several decades have passed during which the movement has expanded to several states, and on May 5, 1919, the League of Red Cross Societies was formally established, headquartered in Paris, France, by the Red Cross Societies of France, Great Britain, Italy,

Japan, and the United States. Starting in 1939, it has had its permanent headquarters in Geneva, Switzerland, and has become the leading humanitarian organization providing humanitarian protection and assistance to victims of armed conflicts and other situations of violence. Additionally, in the field of International Humanitarian Law, the Red Cross or the International Committee of the Red Cross (ICRC) has become its main advocate, working for its strengthening and development.

In Romania, the Red Cross Society was established on July 4, 1874, being one of the oldest societies. It is the largest humanitarian organization in the country and also, the International Red Cross Federation is the largest humanitarian organization in the world, offering assistance to vulnerable people by mobilizing the power of humanity.

Volunteering has been and will remain a fundamental pillar of social and economic development at the international level, recognized through various legal and institutional frameworks. The rights of volunteers and the encouragement of active participation are important components for a healthy and functioning democratic society, and their recognition plays an essential role in supporting democracy and promoting human rights.

CONCLUSIONS

Volunteering has played a significant role both in history and in the present, contributing to the development of communities and addressing important social problems.

Over time, volunteering has adapted to the needs of society, responding promptly and efficiently to contemporary challenges.

Through volunteering, people build strong connections within their communities, promoting solidarity, collaboration and respect for human rights. Today, volunteering not only supports local communities, but also has a global impact, contributing to solving global issues such as climate change, poverty, and global health.

The role of volunteering remains vital in modern, democratic society, continuing to promote positive change and support sustainable development, bringing together people from diverse backgrounds and perspectives. In this way, it promotes mutual understanding, tolerance, and respect for diversity - essential values in a democracy. Thus, through voluntary involvement, citizens exercise their democratic rights and responsibilities, contributing to building a fairer, more equitable and resilient society.

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COMMUNICATION AND CONFLICT IN IPJ X

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***Abstract:** Optimal communication of the system reveals its advantages also within the Romanian Police. The work of a policeman is based on my own knowledge and communication skills and now that I work in the Ministry of Internal Affairs, I noticed that this opinion has been substantiated and even emphasized. One thing is certain: being part of a law enforcement body is not easy. The criminal environment is highly dangerous and most criminals want to escape impediments that place them outside the limits imposed by law. The policeman is in the crosshairs of the offender. Taking into account all these aspects, the policeman must be in continuous communication, collaboration with other colleagues and develop various methods of identifying those who commit antisocial acts. The greater number of law enforcement teams can lead to deterrence for criminals. Working in the system, I can say that the optimization of the communication process is permanently targeted by police officers and, as a result, many cases can be solved.*

***Keywords:** communication, conflict, policeman, management.*

Introduction

Inherently, conflict is also a common factor in today's society. Looking around us, we can notice numerous divergences between different groups of people, between different individuals, nations. The sources generating conflicts are of the most diverse: the desire for power, supremacy, prejudices, different perspectives on an issue, etc. Conflict is inevitable, but, managed correctly, it can lead to the resolution of many problems.

1. The role of communication and conflict in maximizing performance

1.1. Communication and conflict. Theoretical considerations

As for the communication process, it has received several definitions in doctrine. We rally with McKay M.'s view as a foundation of life, a source of happiness, fulfilment, and satisfaction; Only through communication, he believed, can people gain trust in other people (Florea, 2017:10). Another definition of communication that we want to present in the preamble of this work, belongs to D.R., according to which communication is something omnipresent, something that is always near us and in us. Through it, we convey not only words, but also stimuli or actions.

One of the definitions of conflict that stood out was that formulated by Michael Brecher. He considered conflict as a hostile confrontation that extends over a longer or shorter period of time, considering conflict not as something static, linear, but as a dramatic phenomenon, with multiple valences in intensity and frequency. Conflict is a process, not a specific event (Brecher et al., 2000:3).

1.2. The motivation-performance relationship in modern management

Motivation is the force that pushes a person towards a certain ideal, a goal, it is that intrinsic element that opens the way to the satisfaction given by the fulfilment of a dream, aspiration, desire. Over time, several theories of motivation have been created. Most of these theories have pointed out that people, regardless of status, ethnicity, gender, etc., have a certain scale of needs. These needs, however, are not the same for all people, but are different from individual to individual. This difference is normal and is determined by several conditions. Among these conditions we mention: the environment in which the individual lived or heredity (the spiritual and inner inclinations of the individual, unlike the external aspects, are not given by heredity but by the environment, the entourage that man had around him); Education; personal conception of the person (the individual's ability to make an introspection, an analysis on his skills, on his capabilities, on the qualities and defects he has) ; life experience, etc. (Petrișor-Mateuț, 2019). All these factors play an important role in determining the needs of some people. In any organization, success depends on the quality of people. In order to increase their performance, companies adopt two different models of action. Some of them focus mainly on the material, external side of things, while others focus on people's principles, their way of thinking. The first category includes actions such as financial reward, control of the employee and the application of sanctions when he does not perform a task correctly. In the second category, managers make an analysis on the way of "being" of the people they subordinate, on the way of thinking, on their principles. Following this analysis, actions will be taken to strengthen, modify or discourage certain employee precepts in order to reach the desired goal: the benefit and development of the company.

Performance is an element that is closely related to success. In order to achieve a coveted result in a field, some effort must be made and the individual must prove, among other things, seriousness and professionalism. If we were to summarize all these aspects, we could say that the individual, in order to achieve his goals, must aim for performance. This means that he must have a well-organized schedule, be determined when he starts a ministry, and not give up when things do not go as he anticipated. In terms of types of performance, the doctrine refers to three types: psychic performance, physical performance, and psychophysical performance. Psychic performance takes into account certain objective physical valences such as metabolism or biorhythmic state. This type of performance can in turn be of two types: intellectual dominant, in which reason has the last word and nothing triumphs over it, or emotional dominant. The latter takes into account feelings, momentary states, which play a particularly important role in making decisions, lifestyles. Psychophysical performance is that type of performance in which it is not possible to establish which is more dominant: the physical side or the psychic side (Petrișor-Mateuț, 2019).

We believe that the performance of an individual is closely related to the performance of a group. Any project of a certain value, any more expensive work requires teamwork, requires a group of people working together, supporting each other, to reach the intended goal. Whether we are talking about private companies or state institutions, it is easy to see how a man's negligence can affect the entire work and all the work of his colleagues. In the Police, for example, it is enough for a policeman to slander the name of the Romanian Police by committing a crime, so that all the hard work done by his other colleagues to make this society

a safer place is forgotten and blamed.

As for human performance factors, they can be internal or external. The internal ones can be genetic, educational, training, etc., and the external ones can be informational-instructive and educational, which refers mainly to school and family, and technical-organizational and psychosocial, which refers to state structures and market economy (Petrișor-Mateuț, 2019).

1.3. The role of evaluation in maximising performance

In order for a company or state institution to develop and achieve success, a periodic performance evaluation is needed. This analysis involves an internal control within the ongoing activities, an analysis after which it can be known exactly what are the strengths and which are the weaknesses that need to be remedied.

As any firm or any kind of institution is composed of many people, it is important to look at how to evaluate human resources. Thus, when assessing the performance of human resources, the evaluation of human potential and ability to evolve will be taken into account; behaviour evaluation and performance evaluation. The assessment of potential takes into account the establishment that a particular individual has an inclination towards the activity he carries out. This aspect must be established because only when he does what he likes, man can develop and reach great performances. The behaviour evaluation takes into account how the person treats the work they perform, the attention and meticulousness they give to the smallest details because, often, they make the difference. Last but not least, performance evaluation takes into account the results that the employee reaches as a result of his efforts. Following this analysis, depending on everything the employee has achieved, the director or the immediate boss can reach a conclusion either to keep the individual on the job or to move him to another activity he would be better at. As a result of all these controls, it will be possible to identify factors of progress and regression, a rational distribution of tasks, a better distribution of staff by posts, etc.

2. Case study. Police Romanian.

2.1. General characteristics: duties, significance, classification

For the performance of his duties, especially to fight for the maintenance of a climate dominated by peace and security, the police officer shall be vested with state authority, with public authority, but only during and in connection with the performance of his duties, within the limits of the competences established by law. Law 360/2002 states in Article 2, paragraph 2 that the authority of the policeman's office cannot be exercised in personal interest. If a police officer abdicates the rules laid down for the exercise of his office and acquires certain advantages by exercising the profession of policeman, he commits an offence. One of these offences to which I wish to refer is provided for in Article 295 of the Criminal Code, as subsequently amended and supplemented, which deals with embezzlement. Thus, Article 295, paragraph 1 provides that the appropriation, use or trafficking by a public official, for personal interest or for another, of money, benefits or goods he manages or administers is punishable by imprisonment from 2 to 7 years and the prohibition of the right to exercise a public office (Lupașcu, 2022).

The police officer must exercise his professional activity and perform his duties for the

sole purpose of citizens, the community and in the interest of state institutions. In the exercise of his duties, the police officer must adopt an impartial, objective attitude, clearly analyse things and thus reach a correct conclusion in order to achieve justice. The welfare of the society to which he belongs must be the foundation of the individual's decision to become an organ of law. On the contrary, the policeman will not be able to prove fairness and verticality when he is offered, for example, a certain amount of money for non-fulfilment or defective performance of some job duties.

The Law on the Status of Police Officers also outlines the grades in which police officers in both categories can fall. Thus, there are the following ranks: quaestor general of police; Chief Quaestor of Police; Chief Police Quaestor; police quaestor; Chief Commissioner of Police; Commissioner of Police; Deputy Commissioner of Police; Senior Police Inspector; police inspector; police sub-inspector. In the category with secondary education there are: chief police officer; chief police officer; Deputy Chief Police Officer; senior police officer; police officer (Law 360/2022 on the Status of the Policeman).

All activity that is carried out by the Romanian Police must be based on: the principle of legality, the principle of liaison of police officers with citizens, the principle of cooperation in work between police formations, units and cadres, the principle of operability, the principle of finding out the truth, the principle of formality and the principle of the active role of police units (Constantin, 2014:13-14).

From an organizational point of view, the Romanian Police includes: the General Inspectorate of the Romanian Police, territorial units subordinated to IGPR, DGPMB and county police inspectorates, educational institutions for the continuous training and training of police officers and other units necessary to fulfil specific police duties.

There are forty-one county police inspectorates, corresponding to the number of counties in Romania. All these are subordinated to the General Inspectorate of the Romanian Police. The existence of a police inspectorate at the level of each county in Romania is necessary because, as I mentioned before, crime in Romania is gradually increasing. For example, on the official website of the General Directorate of Police of Bucharest, the crime coefficient in different sectors of the country's capital is presented. Thus, in sector 1, in 2020, the crime coefficient was 99.88%, in 2021 102.8%, and in 2022 112.58% (retrieved from: <https://b.politiaromana.ro/ro/informatii-publice/coeficienti-de-criminalitate>).

A central management would not be able to cope with knowing the criminal situation and, above all, stopping and diminishing it. On the basis of all these considerations, there are forty-one police inspectorates which are intended to know several aspects of the territory over which they exercise jurisdiction. Thus, a well-trained policeman should know the territory in terms of extent and location, peculiarities of the geographical area, ways and means of transport, etc. Police officers also need to know the population in the county where they work. It should be known the structure of the population (number of inhabitants, their age, their occupation, etc.), the relationships between citizens, the customs that exist in the respective county. From a police point of view, the civil servant with special status will have to identify both persons likely to commit crimes and those who have committed crimes. Also, the policeman will have to identify people who can provide information of operational interest to prevent possible antisocial acts. Another particularly important aspect concerns the criminal situation. Criminal status means the total number of antisocial acts, contraventions or crimes

that were committed in a certain place over a certain period of time. The police officer will have to pay special attention to the criminal status in order to know what type of crimes are consumed with predilection in his area of competence and thus create means by which to remove the conditions that favour the occurrence of antisocial acts. The police officer must also take into account events of any nature that are organized in the county. He will have to first inform himself about the nature of the event, about how such events took place in the past, about the pluses and minuses of police activities to maintain public order and safety, and finally, to take appropriate decisions to ensure a climate of tranquillity and peace during the event that will take place. Last but not least, the police's own forces and means will be taken into account. The number of staff, their professional training, their physical and mental strength, sources of information, etc. will be taken into account.

By knowing all these details, the police will be able to ensure justice.

The law enforcement body must be aware of everything that happens in its territory of competence, take note of everything that is happening and act promptly and operatively to stop crimes. Also, teamwork reveals once again its importance, the greatest achievements requiring cooperation between several structures or formations, being the result of actions of the communication process.

3. The first pillar of the Romanian Police: Ethics

3.1. Code of ethics and deontology of police officers

We live in a world where the concepts of "good and evil" are losing more and more of their essence, acquiring an increasingly pronounced shade of grey. What We want to convey by this is that the good of one man can be the misfortune of another and vice versa.

The truth is that everyone has a different perspective on the universe. To one degree or another, the individual "falls prey" to the socio-political, cultural and economic context in which he is born. Great influences on the conception of life will also have family, friends, school and entourage. It is true that to one degree or another we all need the same elements to survive (oxygen, water, food, etc.), but we must recognize that beyond this core, we are much more complex than we imagine. On a more superficial level, as I pointed out earlier, we want different things.

If the definition of the notions of good and evil may differ from person to person in certain areas, within the Romanian Police things acquire a special simplicity in this respect due to the normative acts and not only, which draw a series of principles, rules governing the activity carried out by police officers. Within these normative acts we are presented, among others, the duties of the policeman, the conduct he must have in carrying out his duties, his rights and obligations, etc. Thus, an overview of what "good" means and what "evil" means, the good being seen in the form of how a law enforcement body must relate to society and its own duties, and evil being presented by what a policeman should not do.

Law nr. 218 of 23 April 2002 on the organization and functioning of the Romanian Police, republished, with subsequent amendments and additions, outlines a "good" to be achieved and maintained by police officers in the form of their duties. Thus, in Chapter 3, Article 26, we are presented with several main tasks:

- Defending life, freedom of persons,
- Protection of public and private property, fundamental rights of citizens,

- Application of measures necessary to maintain public order and security,
- Preventing and combating crime,
- Identifying and stopping elements that pose a danger to the life and integrity of persons and to public or private property, etc.

From all this information, it is concluded what the concept of "good" refers to within the Romanian Police, namely the safety of citizens. Ensuring a climate of tranquillity and peace, in which all fundamental rights of the human being and of the citizen are respected, is the very goal that law enforcement bodies must achieve. In order to fulfil this desideratum, the policeman must prove maximum responsibility and attention in everything he does, to prioritize the welfare of society over his own well-being and comfort.

The aforementioned law not only sets the standard to be achieved, but also provides the means by which it can be reached. Thus, in Article 31 of the same law, we are told that the police officer is vested with the exercise of public authority and thus: legitimizes and identifies persons, according to the legal provisions; leads persons whose identity could not be established at police headquarters; perform body control of persons and baggage check when there are serious indications that the person would hide objects prohibited by law; carry out raids when there are indications that a crime has been committed; carry the necessary weapons and ammunition, etc.

Also, for drawing a difference between good and evil within the Romanian Police, another document has significant value. It is about the Code of ethics and deontology of the policeman, approved by Government Decision nr. 991 of 25.08.2005. Taking into account the significance of the Police within society, the legislator considered it appropriate to draw up a series of norms for the policeman to follow exactly, a scale of values or a set of precepts to govern the activity of law enforcement bodies. In any democratic state, bodies vested with the exercise of public authority must have a respectful and, why not, irreproachable conduct. These bodies must be an example of honesty, justice and fairness. Being under these attributes, police officers will have a greater credibility among society, they will be respected and honoured for the way they execute their activities.

In its preamble, the Code outlines its purpose and refers to the main functions of the police. Thus, in Article 2, paragraph 1, we are informed that this code establishes a set of rules of conduct for the Romanian police officer. Any policeman must follow these rules with all his might. In order to prevent a possible abuse of power, the Code also refers in the same paragraph to the fact that any person may require the police officer to comply with the rules laid down in the Code. Thus, man is not encouraged to have a passive attitude when he encounters a law enforcement body that abuses his power, but on the contrary, he is encouraged to require the policeman to adopt a conduct worthy of his profession.

The Code of Ethics and Deontology of the Police emphasizes the fact that police activity is a public service, all police missions being carried out in the interest of individuals and the community, as well as in support of state institutions, as provided in the international and domestic legislation applicable in the field. All the primary activities carried out by the Romanian Police perfectly fit the idea presented above. Protecting the rights and freedoms of individuals, defending public and private property, preventing and combating crime are the main functions of the police that are exercised in the interest of the community, of the state.

Article 6 sets out the principles governing the professional conduct of police officers. These are as follows: Legality, Equality, Transparency,

Capacity and duty of expression, Availability, Priority of public interest, Professionalism, Confidentiality, Respect, Moral Integrity, Operational Independence, Loyalty.

To these precepts is added the principle of presumption of innocence. It takes into account that until there are good reasons to prove that a crime has actually been committed by a person, the individual will be considered innocent. The police officer must perform his prerogatives with maximum objectivity and in a fair manner. He will have to develop the ability to think "coldly", that is, not to be influenced by what he feels would be right, but to meticulously research every detail and after a thorough analysis, to arrive at the right solution.

We have previously stated that law enforcement bodies must respect human rights and fundamental freedoms. All actions that police officers take towards any person must be in strict accordance with the law and must not allow the policeman to be influenced by certain characteristics of the individual (origin, ethnicity, nationality, sex, etc.) One of the most important documents when it comes to presenting people's rights and freedoms is the Universal Declaration of Human Rights, adopted on December 10, 1948 by Resolution 217 A at the third session of the United Nations General Assembly. Among the rights that are enshrined in this document we mention: civil rights (right to life, inviolability of housing, free movement, etc.); political rights (right to asylum, right to choose, citizenship); economic rights (right to property, equal pay for equal work); procedural rights (right to a fair trial, right to effective remedy, etc.) and social rights (right to work, right to social security, right to rest and leisure).

3.2. Managerial communication-cybernetic system

The good, in order to be encouraged and increased, must be rewarded accordingly. Evil, equally, must be properly punished in order to be deterred and stopped. For this society to progress, exceptional deeds undertaken by a person must be recognized, appreciated and ultimately rewarded. Deep down, the individual has the desire and, why not, the need to be appreciated, the need to belong to a certain collective. Thanks to this striving, the individual overcomes his limits and makes great efforts to achieve a result. The employee wants to be appreciated by others after all his efforts. The individual constantly feels the need to be useful to his fellows. We, as a society, must always have our eyes open to see these people and encourage and appreciate them for their actions. Only by doing so, the organization will achieve its goals through the reward system, awards, etc. the population in general.

This system of thinking is also found within the Romanian Police. Many police officers and agents go to great lengths to solve complex cases. They often sacrifice their free time, and sometimes even their family, so that eventually the truth will come out in a given situation and justice will be served. From our point of view, this sacrifice on the altar of justice must be observed and rewarded accordingly. Currently, among the existing means for rewarding police officers who achieve outstanding results we mention: advancement in rank, awarding a diploma of excellence, handing out plaques of honour, etc.

Finally, we notice how all the normative acts presented in this chapter have the role of defining within the Romanian Police the eternal concepts of "good" and "evil". All the rights and obligations of police officers, all perceptions that must govern the activities undertaken by

police officers, all principles for the application of police measures, form a whole by which the legislator defines "morality" for law enforcement bodies. The "good" defined in this sense is continually encouraged by rewarding people who show initiative and dedication and who sacrifice themselves, often for the sake of high moral principles.

4. The second pillar of the Romanian Police: Communication

4.1. The role of forms of communication in police activity

Regarding the levels on which communication is carried out, the doctrine refers to three: verbal, written and nonverbal communication (Cuc et al., 2015:44).

Verbal communication is an important form of communication and has several characteristic features that differentiate it from other types of information transmission. Verbal communication is permissive and circular, in the sense that, within it, one can easily return to details or information that appeared after the formulation of the basic message. This type of communication is influenced by circumstances, in the sense that the receiver can perceive the message differently, depending on the state of fatigue, the level of stress, his mood. Last but not least, verbal communication is influenced by the individual traits of the sender and receiver.

Written communication is a much more formal type of communication than oral communication and is characterized by readability, adequacy and fairness. In this type of communication, medium-length phrases must be used, common expression and unnecessary words must be avoided so that the receiver can perceive the message as well as possible. Written communication has a number of advantages, but also a set of disadvantages. Among the advantages, we mention: the possibility of distance communication, the possibility of the sender to linger on the message before transmitting it, the possibility of transmitting more complex messages, so that the receiver always has access to information and can reread it. Among the disadvantages of this type of communication, we refer to: feedback is delayed, sometimes even absent, for the elaboration of a written message the effort is higher, the receiver does not have the opportunity to ask questions, etc.

Nonverbal communication is by far the most important form of communication. Peter F. Drucker said in this regard that the most important thing is to hear what no one says (Cuc et al., 2015:68). Nonverbal communication involves an accumulation of signs that can be encoded by the receiver and that can contradict, reinforce or replace what the sender wanted to express. The receiver pays the most attention to this type of communication. Among the basic characteristics of this type of communication we mention: the fact that it is unintentional, emphasizes verbal communication, is the expression of the level of culture and civilization, can contradict some aspects of verbal communication, is most often marked by ambiguity. According to Mehrabian A. and Weiner M., in oral communication 55% of information is retained and perceived through nonverbal language (gestures, mimicry, facial expression, etc.) (Cuc et al., 2015:68).

Within the Romanian Police, we encounter all these types of communication. The use of a particular type is determined by the circumstance of the policeman. Thus, in a discussion with several colleagues to establish an action plan, verbal communication will be mainly used. Written communication occurs most often in the prosecutor-police relationship, when the prosecutor will give him a note of instructions, in which he will inform him of the steps to follow in a certain case, usually more complicated. Communication Nonverbal is determined

by tense situations, which do not allow police officers to communicate with each other. For example, in an altercation, the policeman who is assaulted by a large number of malicious people, through a gesture, can convey to his colleague a certain idea (use of tear spray, use of weapons, call for reinforcements).

4.2. Functions of managerial communication and managerial communication styles with applicability to IPJ X

The main objective of communication is to modify the behaviour of the receiver. The objectives of communication are diversified. In doctrine we are given multiple other views as to which they are or should be below the objectives of communication. One of the opinions we also agree with is the one presented by Nicki Stanton. According to him, through communication we must: be received, be understood, be accepted, provoke a reaction (Stanton, 1995:1). These are the four major goals when it comes to communication, and if you fail to achieve at least one of them, you can consider that the communication process has failed. On the contrary, if all these goals are achieved, it can be considered that the communication process has been achieved in the best conditions.

In order to achieve the latter result, communication must perform several functions. Among them we mention: information (providing information necessary to perform tasks, providing information for implementing decisions, ensuring access to information); transmission of decisions (communication of decisions taken at unit level and creation of a climate conducive to compliance and fulfilment); influencing the receiver (initiating dialogues with employees / subordinates to know their personal opinion about certain situations, encouraging dialogue between employees to create the family framework); employee training (informing employees of the skills and capabilities they need to develop, amplifying the ability to solve spontaneous problems); image creation (development of consciousness of belonging to a particular group fighting for the same goal); motivating employees and promoting organizational culture (Manolescu, 2010:8).

These communication functions are also respected and monitored within the Romanian Police. The most important function of communication, namely information, is considered, in particular, by those holding leadership positions. The boss informs the subordinate about the existing criminal situation and gives him instructions on how best to act. The transmission of decisions shall also take place within this institution in a timely manner. This function of communication is also performed by those who are in leadership positions. Following a thorough analysis, the head of the unit makes certain decisions and subsequently initiates a meeting through which he will inform subordinates of its content. Image creation is the function that is crystallized mainly by the existence of the uniform. By wearing the same clothing and channelling all their energy towards the same goal, police officers gain a sense of power and devotion to their institution. Lacking the cohesion of teams, police training is carried out by hierarchical chiefs through different means: training, other courses. Within it, the hierarchical heads will inform the agents and police officers about the rules they must respect in conducting criminal investigations, in the complex process of finding out the truth. They will be subject to different procedures for compliance with the rules within the managerial communication program. This function of training plays a substantial role in training and maintaining high-quality professionalism.

Communication style refers to a set of interpersonal behaviours used in one circumstance or another. What is important to remember is that there is no right or wrong style of communication. It all depends on certain situations, on the context. The doctrine retains several styles of communication: passive communication (refers to the ability to avoid conflict by neglecting one's own needs and desires and prioritizing the interests of the other); aggressive communication (is at the opposite pole of passive communication and refers to the use of threats or ridicule to attack another person's concepts); assertive communication (it is in the middle between passive and aggressive communication and refers to expressing points of view in a diplomatic manner so as not to disturb the interlocutor), etc. (Cuc et al., 2015:27).

The communication styles mentioned above are also found mainly within the Romanian Police. Thus, in the hierarchical chief-police relationship, the communication style based on the directive will be pragmatically felt. The superior will assign a series of tasks for the subordinate with the expectation that the latter comply with them exactly, according to the saying: "Order is order." The egalitarian style will be felt in the police-policeman relationship, that is, between colleagues. Being in a more complicated situation, the policeman can ask for advice from other colleagues, relating to them in a friendly manner, based on mutual trust. The structuring style is mainly used by immediate bosses in work meetings. Police officers are regularly instructed on the rules they must follow and the procedures to be applied so that all fundamental rights and freedoms of citizens are respected. The dynamic style, as the name suggests, we identified in tense situations, where action is superior to communication. In order to capitalize on an operative moment, the basic information must be communicated as succinctly as possible, following the catch of the offender in flagrante. The abandonment style is rarer, but it refers to that situation where, due to the criminal's dangerousness, the policeman calls a crew of gendarmes to face him, as they have specialized training in this regard. Thus, the policeman, in those moments, can be said to adopt a support role, the gendarmes fulfilling the main activity. Finally, the last style of communication, that of avoidance, is found especially in the police-suspect relationship. Being interviewed, the suspect often chooses not to answer the questions asked by the policeman and either nonchalantly changes the subject or adopts silence as a way of defence. We identify here the role of the investigator trained with specific techniques to lead the dialogue towards the achievement of the ultimate goal of the communication process: finding out the truth.

4.3. The importance of knowing body language

Communication through body language is, on the other hand, one of the most important types of communication that a police officer must pay attention to. About 55% of communication is expressed and transmitted through the body. Body communication can reinforce or contradict what a person says. When communicating, a person uses, voluntarily or involuntarily, facial expressions (frowns, smiles, etc.), gestures (hand movement, body position), etc. A person may also communicate through; orientation (whether or not to look at the interlocutor), body contact (a light pat on the shoulder), body movements, etc. (Stanton, 1995:2).

When interviewing a witness, a suspect, an injured person, TC., the policeman must pay special attention to all these factors. By understanding the body language of the person being interviewed, the policeman will know what to focus on or, conversely, what to avoid.

For example, if the interviewee raises his eyebrows while the policeman is talking about a certain aspect, this is a sign that the individual has been aroused attention and interest. In those moments when the law enforcement body will notice this reaction of the interviewed person, the policeman is encouraged to continue the topic addressed, and then ask the necessary questions. Another particularly important aspect that will be taken into account by the policeman refers to the position of the head. A slight tilt of the neck is a sign of openness. The neck is one of the most vulnerable parts of the human being and by the fact that the person interviewed chooses to expose it, it means nothing but trust and comfort. When observing this body language, the policeman must continue the discussion so as to maintain this climate conducive to declaring the truth. While the suspect relates what happened in response to the officer's questions, the position of the palms can make all the difference when it comes to the accuracy of the information provided. A person who has open palms is a person who does not hide anything and who is honest. This body language is also a good "honesty detector." Crossing your heels is another body movement that says a lot about a person. If during the story, the suspect crosses his heels, this is a sign of discomfort and stress. Most of the time, this move is carried out at key moments of the statement, when the person feels guilty and tries to mask the truth. Another very important body language is to put your thumbs in your pocket. This gesture denotes insecurity and fear. Usually, the suspect uses this body language when the officer is more authoritarian and raises his voice. It is recommended that the police officer be calm throughout the interview so as not to influence the suspect (Joe, 2018). It will be considered noticing the inconsistency between verbal and nonverbal communication, trying to adopt "positions" to support the lie, tracking the authenticity of statements with the help of polygraph.

5. Conflict resolution

5.1. Conflict between obstacle and necessity

Since the beginning of the world, it seems that one element that has existed and continues to exist is conflict. As we have shown in previous chapters, people being different, have different, often divergent goals and interests. One person's gain may represent another's loss. It is natural for everyone to want to achieve their goals, but the problem lies in how to reach the "bottom". It should also be pointed out that there can also be conflicts within a group of like-minded people who have different perspectives on how to achieve success. So, the occurrence of conflicts is not limited to having different goals, but also extends to the means used to achieve an objective.

As for the types of conflicts, opinions are divided in doctrine. We will rally to the view that there are three types of conflict: personal conflicts; interpersonal conflicts and organizational conflicts (Agabrian, 2008:61).

Personal conflicts refer to different ideas, desires or values that the individual keeps within himself, and which often conflict with each other. This type of conflict is also generated by the battle between personal inclinations and group expectations, between doing what is advantageous and doing what is seen and welcomed by others.

Interpersonal conflicts refer to the fact that between people there are differences in perceptions, experience, interests, etc. They often compete for limited resources (salary, promotion, etc.)

Organizational conflicts arise when differences in authority and power within an institution are not mutually accepted.

As stated before, conflicts are inevitable and present within any institution. Therefore, there are also certain divergences in the Romanian Police that need to be noticed and eventually remedied. The three types of conflicts presented in Mircea's book *Agabrian* also makes their presence felt within the police inspectorates.

Personal conflicts often arise before a hearing. The policeman will have to form a well-organized, thought-out action plan, prepare the most appropriate questions and meticulously document the facts that occurred and the person to be heard. The ultimate goal is simple: to find out the truth and hold the guilty to account. To get to this point, the policeman may have different, sometimes even divergent, ideas and strategies. For example, if a murder was committed and as a result of this act several objects used by the criminal were seized, the police officer must decide whether presenting these tools to the suspect during the hearing will be beneficial to solving the case or will delay the criminal investigation. Some suspects may provide useful information to the police during the hearing, but after presenting materials that could accuse them, they may enter a state of nihilism, absolute denial and may decide to remain silent and not provide any more information. As a result, the law enforcement body must inform itself about the suspect's temperament and personality and, based on this information, plan its work.

Interpersonal conflicts are mainly present between co-workers. Given that a limited number of police officers can be proposed for early advancement, some of the police officers and agents fight hard to stand out in different cases or cases. Unfortunately, it can also go to the bad extreme where police officers will no longer be willing to lend a helping hand in conducting investigations. We could also observe this at the "Alexandru Ioan Cuza" Police Academy in Bucharest. Some students, in order to have as high an average as possible and thus choose the first places in the distribution, responded negatively to their colleagues who asked them to send them the subject for exams. This "hunger" for limited resources makes its presence felt even in school.

Organizational conflicts are also present within one of the most important state institutions. These can be generated, for example, by the discrepancy in experience and still holding a management position. This is visible when an individual graduates from the Police Academy and is employed as an officer, sub-inspector. Officers are superior to police officers given the university training they have. Thus, a 21-year-old can be put (and often is) in the position of assigning tasks for his colleagues, police officers, who can be over 40 or 50 years old. They often do not accept instructions from a younger person, and this creates a tense situation.

5.2. How to resolve conflicts

Once a conflict is identified, it must be resolved immediately by extinguishing or integrating it. The conflict resolution activity is a pressing one because conflict, by its intrinsic nature, can affect the image of an institution (Coman, 2009:181). The more prestigious the institution, the more a divergence or misunderstanding will affect how the organization is viewed. When it comes to the Romanian Police, seen as an institution with a fundamental role in ensuring a climate of peace and safety in society, the way conflict is managed has strong

influences on it. Even if citizens cannot know the source of a conflict, they will notice the tension existing among police officers and errors or shortcomings in performing work activities. This can cause distrust of the population in the capabilities and professionalism of persons vested with the exercise of state authority. To avoid this, conflicts must be remedied or integrated once they are detected. These processes will demonstrate the efficiency of the management system and in the following, we will present some ways to resolve conflicts within the Romanian Police.

One of the most important ways to remedy various misunderstandings is dialogue. I believe William Isaacs' vision of dialogue (a way to extract energy from our differences and channel it into something new, novel and beneficial (Isaacs, 1999:1) is a true and complex one.

Daniel Yankelovich believed that dialogue has three primary characteristics:

- Equality and absence of any coercive influences (parties to the dialogue are seen as equal, regardless of the degree of authority they hold)
- Empathic listening (the side in a dialogue must put itself in the position of the other party and vice versa)
- Open expression of thoughts and assumptions (Yankelovich, 1999:41-44).

We believe that through an efficient dialogue, in the sense of the ideas presented above, most of the problems within the Romanian Police can be remedied.

A misunderstanding that can be resolved through dialogue concerns the situation when a complex case is assigned to a larger number of police officers, and each of them has different ideas on how to solve the case. The different vision on solving a case is often an element that unnecessarily delays finding out the truth in a criminal case. However, achieving justice is a goal that must be achieved immediately, and so police officers must come to a common point. An effective way to achieve this is dialogue. In a meeting, police officers should objectively present their proposed means of prosecution, accompanied by relevant arguments. After listening carefully to each opinion, they may agree on the application of one of the methods presented. It is worth emphasizing, however, that this is not a question of having right or wrong perspectives regarding the settlement of the case, but of finding the most efficient method of finding out the truth in a case. Another useful way to resolve conflicts between parties is negotiation. The importance of negotiations derives from the fact that they can lead to better collaboration within and outside the institution and from the fact that negotiations can help an individual earn a reputation as a problem solver (Manolescu, 2010:82). According to other views in the doctrine, negotiation is a process by which we manage to get what we want from those people who want something from us; a process aimed at resolving a conflict between two or more parties who are willing to reach a mutually acceptable compromise; a process by which we convince the other party that our proposals are pertinent and of interest (Kennedy, 1998:9). The doctrine emphasizes two main elements common to every negotiation situation encountered in practice: mutual dependence and mutual adjustment (Manolescu, 2010:85).

6. Conclusions and recommendations

Communication and conflict exist everywhere in the contemporary world. The setting in motion of any mechanism depends on these two main elements. Properly managed, both communication and conflict will reveal their advantages and encourage progress and empowerment.

Communication, in particular, is indispensable when it comes to complex tasks or expensive projects. In the absence of the ability to transmit information, the project is destined to fail. As I show in the content of this paper and within the Romanian Police, communication plays a basic role in finding out the truth in different situations. Effective communication between chief and subordinate, between colleagues and between policeman and citizen, will make the prosecution faster and more operative.

Of all types of communication, by far the most important is nonverbal communication. Many times people try to hide something, and they are now experts in the art of obfuscation. An individual with some knowledge of body language will be able to detect those gestures, expressions, movements, etc. that betray what a person wants to convey. The importance of verbal communication derives from the fact that it is present in most interpersonal conversations and from the fact that it often conveys more details and information than verbal communication (Kory, 2013:204-205).

The policeman must know mainly body language given the type of people he faces on a daily basis. In an attempt to evade prosecution and get away with it, the offender will resort to numerous means of concealing the truth. However, a well-trained police officer will manage to notice, despite everything that the offender transmits, certain behaviours and gestures that indicate that the person in question is telling lies.

Currently, there are numerous courses within the Romanian Police for initiating and improving law enforcement bodies in the mysteries of nonverbal communication. One of the courses that police officers can attend is entitled: "Body Language. The Art of Nonverbal Communication".

Conflict can play an important role in detecting malfunctions and resolving them. Conflict, by its complex nature, puts an insurmountable barrier in carrying out daily activities, declares, in other words, a "pause" in the uninterrupted run towards achieving goals.

Within the Romanian Police, conflicts often arise. They manifest themselves at the level of several relationships: boss-subordinate; policeman-policeman; policeman-citizen. Their existence should not be seen as a permanent barrier to policing, but should be perceived as signals that something needs to change. By using the most effective methods of conflict resolution, dialogue and negotiation, police officers can overcome any vicissitude and move forward on the path of professionalism.

Communication and conflict remain paramount elements within the Romanian Police system. The optimal communication process at the level of law enforcement bodies and their capacity to resolve conflicts form the unshakable foundation on which one of the most important institutions of the Romanian state must be based: the police.

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THE SPIRITUAL CONNECTION BETWEEN THE CARTOGRAPHY OF THE HUMAN SUBCONSCIOUS AND THE STRUCTURES OF NEOLIBERAL THEOLOGY

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Abstract: *Usually, an economist, a manager, a business administrator, or any other participating member of the free market has a single and clear view of the pecuniary value of goods and the nature of capital. The logic of capitalism allows the economic agent to assign clear values to goods based on several factors. Although such a strict view of a good and its nature is mechanically correct, it is an incomplete one. Economists and economic theorists more broadly agree that commercial goods, whether they are directed to the consumer or intermediate goods in the production chain, are the result of human labour.*

Keywords: *neoliberalism, capitalism, economic, theories.*

INTRODUCTION

The economic structures of the 20th century, which are still used in our age, are concerned rather with economic ontology and teleology. The economist's concern is not man, but the structure formed by men to facilitate commerce between individuals, legal entities, or states. The 21st century has brought with it phenomenal technological progress, but at the same time it has brought new problems that the economic systems conceived and adopted in the past could not foresee and, as such, have no satisfactory solutions for the new human challenges.

Under the neoliberal empire, man becomes a product and all his activities become activities of a productive nature. Every time an ordinary citizen opens their phone and uses an app, regardless of the app, they provide data about their behavioural patterns for free. These data are perhaps, in our era, what the most valuable resources for all businesses, be they local or multinational.

Given the fact that post-modern human no longer has no moment to simply be human, but they are constantly a producer or an intermittent good with the aim of bringing new flows of capital into the "free market", we must ask what is the effect of such a new status as homo productur on the human psyche.

II. Neoliberalism, the monstrous offspring of Western thought.

Neoliberalism is a rare term in the perpetual terror machine we call mainstream media, yet every human being has an intimate phenomenological understanding of neoliberalism. We see either the effects or the offspring of neoliberalism in our daily lives. We see products, services, jobs, phenomena that cannot be observed in a Soviet or Keynesian economy. The birth of neoliberalism, or even a clear definition of the term, is a difficult task for any researcher.

Philosophically, we can identify neoliberal ideology from the writings of American economist Frank Hyneman Knight and Austrian economist Friedrich August Hayek. For these two economists, and for other neoliberal economists, the state must not intervene in any way in the free market. They are against communism and Keynesian models from every point of view, and even more, they believe that such economic models are the causes of the great financial crises.

For Hayek, the financial recession of the 1980s was caused by Keynesian economic models adopted in the interwar and immediate post-war period. According to his book, *Unemployment and monetary policy*, he criticizes the Keynesian model for the inflation it causes and its effects.

Through Keynesian policies such as social assistance or the public health system, the state is forced to produce more currency through national banks. Of course, through an influx of foreign currency into the economy, it will lose its value. Thus, inflation appears which appears to be excessive for neoliberal economists.

Hayek's proposed solution is temporary suffering followed by a return to normalcy (Hayek, p.13). If the currency stays at the same value during a recession, inevitably, some jobs will be lost, and a hard time will inevitably follow for the proletariat.

Hayek is not unaware of how ordinary citizens will perceive such anti-inflation measures. However, a politician must remain steadfast and impose unpopular measures to save the economy in the long run (Hayek, p.9).

It is impossible for an industrial or service-based economy to live with huge inflation like South American countries. This inflation results in "labour trickling". By tricking labour, Hayek refers to the change in the distribution of money and resources in periods of increased inflation and the attractiveness of certain jobs in periods of high inflation (Hayek, p.12), that is, certain games of perception that South American governments used to maintain an illusory economic balance.

If the first signs of recession are observed and countered, a depression of the economy, or an economic crisis, can be avoided. Again, Hayek considers necessary an economic restructuring that aims to stabilize the national currency by lowering wages, by fluctuating or elastic prices and a temporary suffering of the labour force.

Hayek condemns fiscal and political authorities for not understanding how the "game of economy" is played. For him, the return to the gold standard is a necessity that could once again stabilize the world economy (Hayek, p.19).

The second economist, whose work I consider essential to understanding neoliberalism, is Frank Hyneman Knight. The analysis of his essay *Fallacies in The Interpretation of Social Cost* is important. In this essay Knight criticizes the perspective of the British economists Pigou and Graham.

Pigou and Graham proposes the following thesis: if we give industry unlimited freedom then it will invest precious resources in goods or products whose needs cannot be economically met in the long run.

Example Pigou's, that of public and private roads, is explained in the article (Knight, p.219). If there are two roads, one private but much too narrow for which a sum must be paid directly to the owner, and one free, wider but poorly maintained, the effect will be that at some point both roads will be used.

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This phenomenon happens because of the way these two roads are organized. On the one hand, the private road is more efficient because it is better maintained, but being too narrow it leads to delays in the transport of goods. The public road, although more dangerous for business because of its poor condition, will become equally attractive for the transport of goods. With this example Pigou wants to demonstrate the tendency of private industry to produce goods or provide services that tend to lead to financial losses.

Pigou believes that such infrastructure projects are more effective when the state takes charge of them and maintains them with tax money. If a private business were to manage such projects, it would not be able to provide as good a service because it would have to constantly aim for the maximum profit from the minimum investment.

Knight disputes this conception (Knight, p.224). In his view, if all the roads were private, these private companies would be obliged by their financial interest to provide good services. If all the roads are owned by private industry, each road user will pay an amount for the use of the roads directly to the road owner. Because of competition, prices must remain competitive but allow for road maintenance and owner profit (Knight, p.229).

Another factor invoked by Knight is the risk assumed by the investor. He also criticizes the "vague language" used by the economists Pigou and Graham. The latter do not compare different solutions to the problem of traffic and road use. Rather, they are speculating in the absence of a comparable example. There were no freeways or private roads at the time, meaning Pigou had no sample for his analysis, he could only guess.

Both Knight and Hayek died but, ironically, their dreams have been fully realized in America and the states that have been "democratized" by it.

These two economists together with other neoliberal economists such as Milton Friedman, Thomas Saul or James Buchanan had a major influence on politicians such as Thatcher, Nixon, Bill Clinton or Reagan. In the words of far-right journalist Andrew Breitbart "politics is upstream of culture". If politics has become neoliberal, culture will inevitably be sculpted in the neoliberal spirit.

Thanks to these politicians and the brutal and somewhat illogical liberalization of the economic market, we live in neoliberal culture in its entirety. According to the view of the Greek economist Yannis Varoufakis, "the ghost of Margaret Thatcher haunts the European economy" (https://www.youtube.com/watch?v=w6H6tvVuGgo&ab_channel=PoliticsJOE).

All neoliberal economists are against centralized economies, state intervention and public services, and as such criticize in a harsh but sometimes fair manner such economic structures. However, I believe that these economists started from two false premises in their anti-Communist and anti-Keynesian crusade.

The first erroneous premise ascertained these economists is the human factor. Economists such as Marx, Maynard Keynes, Pigou, Ricardo, even the father of economic analysis, Adam Smith, focus on the welfare and survival of society. Man is the centre of economics, not the free market, not the game of economics, but man. For neoliberals, man is a resource and must be treated as such.

The second erroneous premise is the goodness and wisdom of the great capitalists. This premise is explored by Edward Bernays in his book Propaganda. Throughout the book, Bernays repeats this mantra countless times. Rich people form a kind of parallel government, but this is

really good from a moral point of view. Bernays considers the common people to be far too petty and indecisive to make decisions without being guided by someone, either directly or indirectly.

Both premises are observed in the internal politics of the United States. Domestically, America has adopted various policies that allow the free market to function without restrictions, such as the passage of the Tax Services Modernization Act in 1999 by the United States Parliament and then-President Bill Clinton.

The 1999 Act repealed the Glass-Steagall Act. Under the old legislation, the banks that offered investments could not also offer commercial products such as loans for the purchase of a property and vice versa (<https://www.federalreservehistory.org/essays/glass-steagall-act>). In 1999 this limitation was removed.

Although this decision led to a period of economic boom, it was also the main cause of the financial crisis in the year 2008. Because of this new freedom, the banking system used all available resources for investments that led to an imbalance in the real estate market.

II. Cartography of the subconscious (Sigmund Freud, Karl Marx).

This paradigm, "mapping the subconscious" is a vague one. To this day we cannot declare the human mind to be 'understood' or 'discerned'. Many aspects of the human mind remain undiscovered or unexplained. This realm, which exists but is inaccessible to man in a conscious manner, is called the subconscious.

The father of modern psychology and psychiatry, Sigmund Freud, himself identified several forms of the mental economy. In his 1900 book, the interpretation of dreams, Freud presents the topographical model of the mind and mentions the existence of an economic structure of the mind.

In the aforementioned book, Freud divides the human mind into 3 regions, subconscious, pre-conscious and conscious. Through the subconscious structure (Freud, p.613), Freud presents a part of the mind where there are certain desires and drives considered atypical but which cannot be fully understood.

This region of the mind it represents one of the two main objects of our study, namely, the subconscious. This force which conceals the totality of the initial intensities leading to conscious actions is still unknown to man.

Freud actually tries to propose the following route of the subconscious space. The conscious is only the sensory apparatus that perceives the external stimulus and influences the material world, pre- the conscious is the censorship barrier (Freud, p.616) that differentiates the impulses that have an effect on the subconscious topography.

The subconscious is where the self is born. This possibility is observed in artists who rather present the artistic process as an unconscious or subconscious process (Freud, p.613). Thus, the subconscious finally acquires a tangible form.

A first economic structure presented by Freud is that of matter and dream. According to Freud's ideas, matter is for dreams the equivalent of an investor for an entrepreneur (Freud, p.561). For an entrepreneur to be able to start a business, he will need one or more investors. In some cases, the entrepreneur is also the sole investor. In other situations, one investor will sponsor several future entrepreneurs or several investors will contribute to a single business.

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Freud observed a connection between the material conditions of the psychoanalytic subject and dreams to it, the subconscious processes that we cannot understand concretely. The third element introduced by Freud is quantity. Quantity for Freud is actually the level of intensity of experience and how the subconscious processes this quantity.

If the physical experience is strong enough, it will become the central point of a dream, a series of dreams, or, because of insufficient intensity of an experience, it will become a secondary point of the dream. So, we see a direct connection between our desires, ideas, dreams and the material world. These elements of the material world that we perceive through our senses, through consciousness thus become parts of the subconscious relief.

Freud describes this investment of libidinal energy by the terms *cathexis* and *anticathexis*. The influence of the material world manifests itself between these two actions of investing interest in certain objects, people or concepts or not.

Another economic form of the mind conceived by Freud is that of excitations. In his 1920 book, *Beyond the Pleasure Principle*, Freud proposes an economic form whose capital is vivacity. Through *Thanatos*, the drive to destroy or self-destruction of the psychoanalytic subject, there is an increase in the level of liveliness, while *Eros*, the pleasure drive of the psychoanalytic subject, decreases the level of liveliness (Freud, 1920, p.3).

Through this simplified economic form, Freud suggests a desire of all living things to return to their inorganic form (Freud 1920, p.21). This economy of ecstasy, in a subconscious way, leads us to certain painful starts or to the repetition of some traumas through actions of a symbolic nature. We repeat these actions in order to acquire an active role in the traumatic scenario, because in this way we acquire a level of control (Freud 1920, p.29).

These two economic forms of the human psyche are factors that shape the subconscious. As such, the relief of the real but invisible self is modified by the economy of vivacity and by the economy of consciousness-processed experiences. While the dream-matter economy is direct, that of vividness is an internal one based on the subject's experience. These two economic forms of the human psyche are comparable to international trade and national trade respectively.

However, Freud was not the first thinker to observe and hypothesize the connection between mental and material space.

Another thinker who intuited and analysed the mind-matter relationship is Karl Marx. Although Karl Marx's ideas were demonized due to the failure of the Soviet Union, his critique of the capitalist system remains not only the most coherent, but also the most comprehensive to this day.

For Marx, capitalist society is defined by the possession of goods, more precisely, by the accumulation of a "heap of goods" (Marx, p.27). This description is correct, the main characteristic of a capitalist, consumer society is the accumulation of many goods, this becoming an incipient form of theology. These goods are not simply possessions. These have various metaphysical, moral, social and aesthetic implications (Marx, p.27).

The three aspects of a psychoanalytic nature presented by Marx that are relevant to our discussion are the materialist dialectic, alienation, and fetishization of possessions.

Materialist dialectic is a modified form of Hegelian dialectic. Initially, the preliminary work was done by Ludwig Feuerbach (<https://www.marxists.org/romana/dictionar/f/>)

[Feuerbach_Ludwig.htm](#)). From Feuerbach's perspective, man becomes the centre of philosophy again, not the spirit that studies itself through material forms.

Marx modified the concept of materialist dialectics. Human consciousness is formed by its interaction with matter and other human consciousnesses. I specified a first characteristic of the subconscious, namely, that it is the real self but hidden and formed by the material world. For Marx and Engels, the dialectic does not start from the top down but from "earth to heaven" (John Rees, p.60). There is no subconscious/conscious separation in his work, but there are "spiritual" effects of the material world.

Marx starts from the "species-being" dialectic (Karl Marx, pp.127-128). Through this dialectic, each species certain inherent characteristics can be attributed to it. For man, the inherent characteristic is work. The human species works beyond its basic needs. We want certain kinds of clothes, certain tools used for work, certain new goods that do not satisfy basic needs but acquire social value through their possession and use.

Alienation is a phenomenon that begins with the birth of trade in the ancient world. From the moment two goods have a pecuniary value, as such, they can be exchanged through currency or barter, there is a separation between the work done to obtain a good and the person who worked to create this good (Karl Marx, p.51-53).

The alienation of goods is a necessary process of modern civilization. Contemporary societies can only exist on the basis of complex and well-organized networks of trade and transport. However, Marx views labour power as a good in itself that the worker exchanges for money (Karl Marx, p.402). Through this process of exchange between the labour power of the proletariat and the capitalist, man feels useless. Work being the essential characteristic of man, he cannot but feel deprived of "spirit" (Hegel, p. 256-257)

The fruit of labour, the goods created by the worker, become separated by the author. In some cases, an ordinary worker would not be able to afford the products that come out of the factory where he works. This distance between people and the fruit of their work, the product of human nature, is heart-breaking.

The third psychological aspect derived from Marx's writings is the fetishization of goods. The fetishization of goods is rather a pathology of early economists, such as Ricardo or Smith (Karl Marx, pp.51-53), who considered that goods have an intrinsic value (Adam Smith, p.51).

For Marx, goods have a strictly social function and value. Through the evolution of trade, goods also acquire a social value beyond that obtained through the work done to obtain it or through the rarity of the raw material (Karl Marx, p.223).

For example, a branded shirt will be worth much more than a generic one bought at a thrift store. With this purchase, the man is not buying a shirt, but the guarantee of quality and the social value of this company. This is the manifestation of commodity fetishism from the consumer's perspective. Through these acquisitions, the proletariat wants to copy the capitalist and his erroneous consciousness (Karl Marx, p.217).

For Marx, consciousness is man himself expressing himself through material actions, he does not in any way develop a differentiation between subconscious and conscious processes. However, Marx noticed before Freud the clear connection between the material world and the inner world in which man lives as a subject divided between the subconscious and the conscious.

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The difference between Freud and Marx is of course the political element. Because of the separation of the proletariat from the means of production and because of the financial surplus produced by labour, it becomes alienated and obsessed with improving its financial and social condition.

By superimposing the political and psychoanalytic conceptions of Marx on the Freudian subconscious structure we arrive at a new relief of the subconscious. The self is born in the subconscious. This self is formed through consciousness by external stimuli. These external factors are either material in nature or the expression of consciousness through the actions of other people. Through other consciousnesses, the material world and the goods that make up this world are modified to facilitate human life or to generate a profit.

The progress of material standards comes with new psychological problems such as the alienation or fetishization of goods. These problems are reflected not only in political or economic structures, but also in the formation of the self and in the economic equations that take place in the human subconscious, whether we are talking about the economy of dreams or the economy of ecstasy.

We can therefore call the subconscious as the real but hidden self, a series of exchanges between impulses balanced by eros and Thanatos built by the material conditions of the psychoanalytic subject. Man is hidden from himself, but he can discern his real person by analysing his material conditions and how they have built him.

III. Neoliberal theology, between Buddhist mythology and Catholic oppression.

Now that we have clear concepts about what neoliberalism actually is and we have an obvious model about the human subconscious, we have one last step left to solve the problem proposed in the title, namely, how an economic and political category becomes a religious one.

Everyone knows Nietzsche's famous phrase "God is dead and we are the doers", but we wonder how many really understand what he is trying to say. By the death of God, we really mean the disconnection of man from the religious structures that have held him in check and tyrannically controlled him and forced him to live under the empire of slave morality. Nietzsche actually offers an optimistic proposition, namely that in the absence of an all-powerful God, man is free to decide what he wants to do.

However, the essence of religion and remains steeped in the symbolic order of all persons, from the religiously devout to the convinced atheist. Mircea Eliade captures this dimension of reality in his book *The Sacred and the Profane*.

All religions are, into a large extent, identical in formation, functions, hierarchies, conditions of membership and the goals proposed to followers.

Any religion, Eliade says, begins with a myth that is a sacred reality (Eliade, pp.95-100). Even farming is, in fact, a sacred activity in religious communities. The totality of the actions, whether undertaken by the Eskimos, by the Dacians or by the Yoruba tribes, are imitations of religious rituals and myths. These myths are sacred periods that open the opportunity for the common, primitive and simple man to imitate the genesis provided by the heroes and gods of his religion.

This structure, however, in the absence of a universalized divinity in small tribes or relatively homogeneous civilizations, remains present in the subconscious of humanity. In the

absence of God, man chose to create a new golden calf (Exodus 32:1-4, Al-A'raf, 148) to control the order he was accustomed to since the birth of the first bipedal primates.

Neoliberalism has become a cultural force through the development of state policies and by encouraging the market to create goods that may be pleasant or luxurious but are fundamentally useless to human life. We can live without 120 cm TVs. but we cannot live without water and food.

Of course, the usual patterns emerge when we observe neoliberalism as an anthropologist would observe an early religion. The elements to be analysed, the roles that the participants of this new religion are the following: the supreme deity, messianic figures, saints, priests, non-practicing members, sinners and heretics.

The supreme deity of neoliberalism is the capital. The totality of the devout members of the church worships profit, efficiency, and generally, the illusion or excess of wealth.

Messianic figures are today's rich people. Anyone who owns huge amounts of capital is held up as an example to the populace, as a mythological hero. The totality of these figures has a messianic image but not a Christian one, rather, these hooligans take the example of Prince Siddhartha, the founder of the Buddhist religion.

The prince Siddhartha is the first person to attain enlightenment according to Buddhist mythology. He became divine by finding the 8 divine paths. In the same way, the great capitalists have stories of the hardships they experienced before they discovered wealth or the noble path to Nirvana.

Both Elon Musk and Trump are perfect examples of this charade. In both cases they present their life before riches as hard and poor. In reality, Trump started his businesses with a "small loan of a million dollars" ([https://www.cnn.com/2018/10/02/trumps-small-loan-from-his-father-was-more-like-60million-nyt.html](https://www.cnn.com/2018/10/02/trumps-small-loan-from-his-father-was-more-like-60-million-nyt.html)) from his father. Elon Musk is the son of Errol Musk (<https://www.businessinsider.com/technology/news/story/amid-elon-musks-constant-denial-his-father-details-4-day-visit-to-emerald-mine-with-billionaire-son-380484-2023-05-08>), a man who owned an emerald mine in South Africa, giving him the money and opportunity to develop whatever business he wanted.

We see a certain level of cognitive dissonance in the case of neoliberal messianic figures. They want to be perceived as Prince Siddhartha who attained divinity through the noble paths but rather, they resemble the demigods of Greek mythology. Born in the right conjunctures to reach this greatness.

Of course, in this structure there are people who have extraordinary talent and have managed to reach this „materialistic enlightenment" through their own efforts and powers, but they benefited most of the time from the opportune moment and the necessary conditions for this becoming.

The neoliberal saints they are of course the first capitalists of the 19th and 20th centuries. People like Ford, Rockefeller, Vanderbilt, Carnegie, etc. are considered models of these new messianic figures. Again, the same cognitive dissonance existed at the birth of capitalism. Most of these industrial magnates were the right people in the right place and committed illegalities or morally deplorable deeds in order to maintain their messianic status for their times.

A good example of this falsehood present since the birth of capitalism is John D. Rockefeller. He is the founder of the American company then called Standard Oil. Through

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her famous investigation journalist Ida Tarbell demonstrated the reality of the monopoly created by Rockefeller.

A first step towards the domination of the oil market undertaken by Rockefeller was the founding of the Southern Improvement Company. This company was really meant to spy and observe the entire market (Tarbell, p.39). Another purpose of this company is to secure a preferential price for Standard Oil.

This hawkish attitude of Rockefeller dome was his interaction with Robert Hanna, the holder of a small oil refineries. When he sought help from the Southern Improvement Company, he encountered new difficulties. The company representative told both him and other small industrialists about the preferential price Standard Oil received for transporting gasoline (Tarbell, p.40). The objective of these economic operations was actually to hinder and even bankrupt the competition.

Such tactics reduced the number of oil refineries in the state of Cleveland from 26 to 6 (Tarbell, p.47). He continued his mission of monopolizing the oil industry through similar tactics (Tarbell, p.51) aided of course by his good friend, railroad magnate Vanderbilt (Tarbell, p.61).

Such unethical actions that resulted in the loss of hundreds or thousands of jobs and the creation of a monopoly, was stopped by the Sherman Antitrust Act of 1890 and the case of United States v. Standard Oil in 1911 that led to the dissolution of the monopoly.

As for the priesthood, the only people fit for such a role are politicians. Regardless of the ideology that these politicians present to the public, they remain in the neoliberal paradigm theology. They can propose Keynesian measures or even, God forbid, socialist measures, but all these measures must be in tune with the desires of the neoliberals.

This truth is visible through the media assassination of politicians like Bernie Sanders or Jeremy Corbin. In both cases these people wanted to raise the wages of the countries' workers in which they were running for the presidency respectively, the role of Prime Minister of Great Britain and to create viable national health systems.

The best example of such stringent policies to maintain neoliberal spiritual hegemony is the case of former Australian Prime Minister Gough Whitlam, who refused certain compromises (<https://jacobin.com/2020/07/gough-whitlam-dismissal-letters-john-kerr-australia>). Because of his refusal, and because he wanted trade relations with Yugoslavia and Australia's exit from the Vietnam War, he resorted to using a forgotten ruse.

Through the Governor-General of Australia at the time, Lord John Kerr, (a position left over from the end of Australia's colonial period, the person appointed to this position of sell the role of defending the interests of the British crown) decided to dismiss him.

Non-practicing members of the religion are ordinary people living in neoliberal economies. These people, although not devoted to religion per se, must practice in a rudimentary manner the rituals of labour exploitation as explained by Marx through alienation.

Who are the sinners of neoliberalism? Poor people. People who cannot achieve financial salvation are seen as lazy, incompetent, mediocre or in some cases malevolent by the neoliberal capitalist. One of the most barbaric myths of neoliberalism is meritocracy. If a man is poor, this man deserves his fate. Neither neoliberal theology nor classical liberal ideology is equipped

with the empathy or dialectical understanding necessary to perceive the material and social conditions that create poverty.

The heretics of neoliberalism are those economic subjects who are enough insightful to understand these religious/ideological mechanisms in part. These people who organize themselves in NGOs, in cooperatives or choose to live an isolated and solitary life. These people consciously refuse to participate in neoliberal religion.

IV. Digitization, the Lutheran revolution of neoliberal theology.

What do we mean by digitization? This term has haunted Romanian media and politics ever since the government of former prime minister Dacian Cioloș (<https://www.romania-actualitati.ro/stiri/romania/dacian-ciolos-romania-urmareste-digitalizarea-administratiei-publice-id87506.html>). For 8 years, our country has been trying to get in line with other European countries and digitize the thick bureaucracy of the Romanian state. Of course, this is a monumental task for any government but, it is no excuse for the countless failures of governments in the last 8 years in terms of digitization (<https://www.europafm.ro/esecul-digitalizarii-statul-roman-cosmin-savu/>).

Although digitization has acquired the role of a sublime object (Zizek, pp.12-15) of the Romanian media, we must broaden the meaning of the notion. In 2021, the Telekom company started a study by which it estimates that 97% of Romanians have a smartphone (<https://www.zf.ro/business-hi-tech/telekom-romania-97-dintre-romani-utilizazea-smartphone-peste-40-19968784>). This figure indicates that the vast majority of the population is partially digitized. Every citizen has at hand a device that allows him to access the Internet.

This state of affairs is a double covenant. On the one hand, access to the Internet has become essential to everyday life, but on the other hand, this dependence on new technologies alarmingly increases not only human isolation but also creates new layer of alienation between the worker and the product of his labour.

No matter what we search on the Internet, each result accessed from the list provided by the search engine has become a new product in the form of data generated and sent to the Internet operator and the network used to find the object of the search.

This product will in turn be invisible to the manufacturer. This virtual data they are sent to big digital companies and processed to later become the fuel for new forms of commodity fetishization. Desire and necessity become indistinguishable under such conditions.

Hunger is a state of fact strictly related to the material world of the subject, lust, on the other hand, is a cultural form of desires. There is a level of mediation between the initial hunger drive and food choice. The effect of neoliberalism through digital channels is the confusion of these two signals and channels of the subconscious economy.

What the what we eat is inevitably influenced by advertisements, propaganda. In the digital age advertisements are chosen automatically based on data collected through internet usage. These ads will not suggest nutritionally rich food. Most likely, they will recommend deeply unhealthy food. This is neoliberal theology in action. The common man is a resource, a factory and a consumer.

In the absence of digitization, such new forms of oppression would not be possible. Of course, standard practices of neoliberalism such as the privatization of some state institutions

THE SPIRITUAL CONNECTION BETWEEN THE CARTOGRAPHY OF THE HUMAN SUBCONSCIOUS AND THE STRUCTURES OF NEOLIBERAL THEOLOGY

would continue but not at this level. Digitization among the global population has accelerated these problems.

As for Romania's political class, about the neoliberal priesthood, we observe a bizarre situation. The Romanian politician was educated by communist politicians who, in turn, were educated in a tyrannical ideology. The same politicians from the communist period together with their teachers have become the neoliberal priests of the Romanian rite. This "priesthood" led to the birth of a period of economic wilderness between the years 1989-1991 where many millionaires appeared seemingly overnight (<https://www.digi24.ro/special/campanii-digi24/1990-anul-0/1990-anul-0-economia-dupa-revolutie-reforme-sabotate-ideologic-440864>).

Under the yoke of this new double covenant, the Romanian politician is caught between Soviet education and the neoliberal market. For almost 35 years, these Romanian political actors have not been able to develop a clear identity of political parties or internal policies. They are really deficient priests of neoliberal theology, not being able to apply brute theory skilfully enough to maintain the illusion of safety.

This situation actually creates a high level of mistrust for foreign investors (<https://www.euronews.ro/articole/romania-ultima-in-preferintele-investitorilor-straini-expertii-spun-ca-exista-spe>) or for the European Union (<https://www.profit.ro/stiri/economie/romania-cel-mai-sever-declin-al-productei-de-servicii-din-uniunea-europeana-21551758>).

Due to the lack of coherence of these thugs who will themselves as the archangels of neoliberalism, the country cannot have the public services typical of the Keynesian or socialist economy, nor the neoliberal illusion of wealth. The common man, again, is being forgotten by neoliberal politics, economics and theology.

Digitization at global level is a Lutheran revolution of neoliberal theology. If in the past there were some reasonable limits on the free market that guaranteed the safety of the consumer or customer, the Internet manages to avoid such measures with great ease.

The digital space presents a new market that has relatively low entry costs and infinite potential for profits. What are NFTs if not wildly expensive products with no practical value whatsoever. Such products are revolutionary for neoliberal religion. The effort is almost non-existent, the potential profit is infinite.

CONCLUSIONS

Angrboda is the mother of all monsters in Norse mythology. This image of neoliberalism as its last generation is ideal, in my opinion. This last growth was strong enough to give birth to a new secular religion of consumption and production in the absence of any clearly defined ethical boundaries that have man at the centre.

Digitalization is a new step in this religion of spiritual cannibalism that began with Hayek, Knight, Milton and their other ideological companions. But is it worth asking what we can do in such conditions?

An optimal solution would be to return to certain Keynesian measures, but such solutions are far too idealistic for the global decomposition of carried away by the new religion.

Such a return is impossible without the adoption of "tyrannical" measures to return to a balance between the freedom of economic markets and the welfare of the population.

The optimal solution would be to fight for our rights to be human through political means such as voting, protesting, organising in "heretic cells", and most of all, search for our lost humanity through community. As kids would have, we need to go outside to "touch grass" and meet people in order to form community

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