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EDITORIAL

Dear Readers and Authors of “Access to science, business, innovation in digital economy”

In the first issue of the journal in the new year, on behalf of the Editorial Board and the Scientific Council, we wish you much health, optimism in action, every good fortune and every success in 2024!

The beginning of the 21st century is the era of the fourth industrial revolution, in which digital transformation is playing a key role, gaining increasing momentum especially in recent years, based on the growing use of the Internet and artificial intelligence. The changes are occurring at an accelerating pace and are having a significant impact on global economic processes. The digital economy is a consequence of technological development. Undoubtedly, it is a consequence of the dynamic development of innovation, which is one of the key factors playing a leading role in creating economic growth and, consequently, the development of a country or region. Innovation in the economy should be understood as the ability of all participants in economic processes to create and implement innovations, as well as their actual ability to introduce new and modernized products, new or changed technological or organizational and technical processes.

Innovation is now seen, as one of the main factors of socio-economic development, as it covers all areas of modern life. At the level of individual enterprises, the development of innovative activity is based on the analysis and consideration of trends that have a significant impact on the nature of the development of individual markets and sectors. A significant role in the development of innovative activity is also played by access to innovative infrastructure, the ability to raise funds, the presence of high-class specialists and the existence of a developed institutional environment. With the acceleration of the pace of scientific and technological progress, the directions of development of economic systems are becoming increasingly clear, among which the most important are:

- in response to technological innovation, there is a shift from mass production to more flexible, customized production,
- the service industry is becoming the locomotive of economic development, replacing the manufacturing sphere,
- knowledge, based on the intangible components of human capital, is playing an increasingly important role in the creation of gross domestic product.

One of the products of innovation is artificial intelligence, widely recognized as a driver of productivity and growth. With its ability to process and analyze vast amounts of data, it is showing potential to make business operations more efficient. The deepening processes of digitization are becoming widespread and global. They affect not only companies operating in the market, but entire sectors of the economy and society as a whole. They are translating into a wide spectrum of connections between countries and societies around the world. Generating and implementing innovations in the form of new products, services, technologies, management methods allows an enterprise to gain or maintain a competitive advantage in the market, which
leads to the development of the enterprise and, as a result, to increase its competitiveness. Since enterprises play a significant role in the economy, innovation affects economic growth and development.

The increasing role of innovation is an important aspect not only globally. Increasing importance is attributed to the level of innovation of a country for which innovation can be one of the impulses of its development. In the long term, it should selectively, in selected areas of science and technology, move from the group of "peripheral technology" economies to the group of technological leaders.

The above-mentioned issues, often of a debatable nature, are undoubtedly the basis for a wide range of analysis for scientists and practitioners, necessary on the way to seek appropriate solutions to regional and global challenges facing businesses, society and the economy.

The main idea of this journal is to provide a place for discussions and information sharing, creating a common concept, principles, methodologies, methods, models, technologies and systems for making management decisions in conditions of uncertainty, risk, danger, instability and crisis for sustainable and viable economic systems, ecological and innovative economy projects.

The journal is increasingly popular in the national and international scientific market, which is a consequence of the dedicated work of all those involved in its development and all its supporters and friends, the participation of scientists and practitioners from many institutions of high international prestige.

We would like to thank the members of the editorial board for their unquestionable competence, scientific rigor and dedication to creating and promoting a network of scientific communities in the journal's profile and promoting scientific research!

We would also like to thank the reviewers for the analytical and well-intentioned motivational feedback!

We would like to thank the authors who present scientific articles of both theoretical and empirical content, representing scientific and practical interest in all areas of economic science.

In the new 2024, we wish you good health, all the best in your personal life and professional work, and further scientific achievements!

With best regards,

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St. Cyril and St. Methodius University of Veliko Tarnovo, Bulgaria

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Editor-in-Chief
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E-GOVERNMENT DEVELOPMENT AND GOVERNANCE IN MENA COUNTRIES: AN EMPIRICAL STUDY

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ABSTRACT

Objectives: The objective of this study is to examine the impact of e-government on a battery of governance indicators in a sample of 17 Middle East and North African countries during the period 2003-2019. Methods/Approach: The analysis is based on advanced econometric tools, which consist of second-generation panel data techniques allowing the control of cross-section dependence and slope homogeneity when estimating the short- and long-run impacts of e-government on governance. Results: The preliminary analysis suggests the presence of slope homogeneity and cross-section dependence in the data, while the second-generation panel unit root test indicate that all variables are stationary at first-difference. The second-generation panel cointegration test indicates the existence of long-run relationships between e-government adoption and governance indicators. Furthermore, the PMG-ARDL confirms that role of e-government in reducing corruption and improving the rule of law in the long-run. On the other hand, no significant impact of e-government on voice and accountability, government effectiveness, and regulatory quality were detected. The short-run analysis also reveals no effects on governance. Conclusions: These results are important for improving institutional quality in the MENA region via the adoption of e-government.

Keywords: e-government; governance; MENA; second-generation panel data

JEL classification: A10; C23; H83.

Paper type: Research article.

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INTRODUCTION

There has been a rising pattern of new technology development by the public and private sectors through the past few decades (Fife & Hosman, 2007; Palaco et al., 2019; Acharya et al., 2022). At the same time, developed countries have been leading the way in creating cutting-edge technological innovations. Statistics from the OECD (2023) indicate that gross domestic research and development spending reached 2.67% of the gross domestic product in 2020. However, the share of spending during the same year exceeded 3% for countries like the United States and Japan, while in developing countries, such as Mexico and Chile, it did not exceed 1%. The existing literature confirmed the important role played by new technologies in supporting economic growth. Indeed, technological progress is often considered a production factor, like labour and capital, and is, therefore, a key driver of economic growth (Jalava & Pohjola, 2002; Çalışkan, 2015). A study by Kan et al. (2022) confirmed that the digital economy had driven high-quality service trade development in China, leading to the expansion of Chinese products abroad and the expansion of the economy. Moreover, Piroșcă et al. (2021)
highlighted the role of new technologies in widespread shifts and development across all industries, resulting in better economic growth rates.

E-business e-commerce, e-health, e-learning, and e-government are new terminologies that have come to the forefront in recent decades due to the incorporation of new technologies, notably the internet, into human lives. E-government has mainly emerged during the past decades to improve government effectiveness and efficiency (Nam, 2019). Silcock (2001) defined e-government as “the use of technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees” (Silcock, 2001, 88). In recent years, there has been an increase in academic interest in e-government. Some researchers have concentrated on drivers of e-government development, while others explored the effects of e-government across various fields. Some studies explored the effects of e-government on the quality of public service (Osei-Kojo, 2017; Li & Shang, 2020; Aljukhadar et al., 2022), foreign direct investment (Han et al., 2021; Al-Sadiq, 2021; Kim & An, 2022), economic growth (Mouna, 2020; Al-Refai, 2020; Azim et al., 2020), and corporate social responsibility (Avotra et al., 2021). Recently, many scholars have started looking into how e-government might improve governance and institutions. Although many studies analysed the repercussions of e-government on governance indicators, including the rule of law, political stability, control of corruption, and government effectiveness, none have focused on Middle Eastern and North African (MENA) countries.

This work aims to investigate the effects of e-government on governance in 17 MENA countries between 2003 and 2019. More specifically, the empirical analysis estimates the effects of the E-Government index obtained from the United Nations on several governance indicators from the World Bank. The analysis is based on advanced econometric tools, which consist of second-generation panel data techniques allowing the control of cross-section dependence (CSD) and slope homogeneity when estimating the short- and long-run impacts of e-government on governance. The current study contributes to the literature in many ways. First, this is the first attempt to analyse the effects of e-government on governance in the MENA region. The MENA region represents a good sample for studying the response of governance to e-government. Indeed, during the past two decades, several MENA countries have made substantial efforts to improve access to government services by adopting ICTs. For instance, the UAE held the 20th place in the world rankings in 2020, while Saudi Arabia and Bahrain were in the 38th and 43rd positions, respectively. The second contribution of the study stems from the fact that it considers different governance indicators. Indeed, most previous studies concentrated on the effects of e-government on corruption (Shim & Eom, 2008; Zhao & Xu, 2015; Elbahnasawy, 2014), while some others analysed the response of the rule of law (Kossick, 2002), and government effectiveness (Nam, 2019; Chen & Aklikokou, 2021). The current research contributes to the literature by considering various governance indicators, which allows for checking the robustness of the findings. Third, the empirical investigation uses a battery of second-generation panel data econometric methods. Indeed, the analysis checks the existence of slope homogeneity and CSD between units and controls for that dependency when testing the unit root. Moreover, the study performs the cointegration test proposed by Westerlund (2007), which controls
for CSD, and finally, employs the PMG-ARDL estimation technique to assess the short- and long-run consequences of e-government on governance.

The rest of this study is structured as follows. Section 2 reports the related literature. In Section 3, we describe the data and techniques used in the empirical investigation, while Section 4 discusses the study's findings. Finally, Section 5 summarizes the findings and recommendations of the study.

LITERATURE REVIEW

There has been an increasing literature analysing whether e-government affects governance. Previous research suggested that the effects of e-government on governance could be conveyed via various channels. First, e-government affects governance and allows the decrease of financial and administrative corruption. Indeed, corruption tends to diminish as e-government develops since fewer face-to-face interactions between citizens seeking government services and employees are required (Ojha et al., 2008; Zhao & Xu, 2015). Moreover, e-government allows reducing the authority of government employees, which in turn decreases the influence of peddling and financial corruption by digitizing regular government services to individuals and businesses (Cho & Choi, 2004). In addition, e-government allows for the modernization of public administration by shifting from paper-based to electronic operations to give citizens transparent services and eliminate mismanagement and bureaucracy. Furthermore, Nam (2019) argued that e-government allows for raising government effectiveness and, consequently, good governance.

The repercussions of e-government on governance have been empirically explored for different countries using various econometric methods, yielding conflicting findings. Some works confirmed that e-government improves governance. For instance, Mistry and Jalal (2012) investigated the effects of e-government on corruption in 108 developing and developed countries between 2003 and 2010. According to the results of the OLS regression, e-government does have a positive effect on lowering corruption. Furthermore, the authors conclude that the adverse effects of e-government on corruption were more pronounced in developing countries. In the same context, Linhartová (2017) studied the consequences of e-government adoption on corruption in 117 countries from 2003 to 2014. The findings strongly confirmed that e-government contributed to reducing corruption. In addition, the regression analysis showed some differences between developed and developing countries, with a 0.12% and 0.14% decrease in corruption for every percentage point increase in e-government use in the former and the latter, respectively. Using data collected from 105 countries between 2004 and 2008, Krishnan et al. (2013) examined the impact of e-government on factors such as economic growth and corruption. According to the PLS methodology, e-government significantly contributes to preventing corruption. Elbahnasawy (2014) studied the effect of adopting e-government on corruption in 160 countries from 1995 to 2009. The dynamic panel data model and Granger causality tests revealed that e-government reduces corruption. Recent research by Park and Kim (2020) used panel data approaches to examine the effect of e-government on corruption in a sample of 214 countries from 2003 to 2016. The results suggested that e-government significantly reduces corruption, whereas the open government has no discernible
The effects of e-government on several forms of corruption in 21 Latin American and Caribbean countries were studied by Kalesnikaite et al. (2022). The results show that e-government reduces only bureaucratic corruption. Recent research by Rahman (2023) on the impact of e-government on corruption supports this view.

While the vast majority of previous empirical research has demonstrated that e-government can improve governance, a few studies have found that corruption persists even after the advent of e-government (Ojha et al., 2008). For instance, Basyal et al. (2018) analysed the impact of e-government on corruption in 176 countries based on the probability reduction approach. According to the data, e-government has little to no effect on corruption. The effects of e-government on corruption in Indonesia and Malaysia were also studied by Purnamasari et al. (2022), who surveyed 240 respondents. Corruption has a more significant impact on government-to-government and government-to-citizen services in Malaysia than in Indonesia, where it only impacts government-to-business and government-to-citizen services.

Regarding the MENA region, it is essential to point out that only one study by Hussaini et al. (2013), focusing on Kuwait, has been prepared. According to the findings, e-government places constraints on the intervention of individuals, which in turn reduces corrupt behaviours. The previous analysis, therefore, suggests the scarcity of empirical research examining the impact of e-government on governance in MENA countries. This study aims to fill this gap by analysing the repercussions of e-government on different e-governance indicators.

DATA AND METHODOLOGY

Data

The goal of this study is to conduct an in-depth analysis of how e-government influenced governance in a selection of 17 MENA countries, including Bahrain, Saudi Arabia, Qatar, Oman, United Arab Emirates, Kuwait, Lebanon, Malta, Morocco, Algeria, Tunisia, Libya, Egypt, Iraq, Jordan, Syria, and Yemen. The period of the study ranges between 2003 and 2019. The choice of countries and study period are dictated by data availability. To estimate the effects of e-government on governance, the following model will be estimated:

\[
governance_{it} = \alpha + \beta EGOV_{it} + \delta gdp_{it} + \theta trd_{it} + \epsilon_{it} \quad (1)
\]

where governance is the dependent variable representing the governance indicator (control of corruption, the rule of law, voice and accountability, government effectiveness, and regulatory quality) and EGOV stands for e-government. The model in Equation 1 also includes two control variables, gross domestic per capita (gdp) and trade openness (trd). Finally, \( \epsilon \) represents the residual term, while \( i \) and \( t \) are countries and years.

By considering the five governance indicators, the following models will be estimated:

\[
CCOR_{it} = \alpha + \beta EGOV_{it} + \delta gdp_{it} + \theta trd_{it} + \epsilon_{it} \quad (2)
\]

\[
RLAW_{it} = \alpha + \beta EGOV_{it} + \delta gdp_{it} + \theta trd_{it} + \epsilon_{it} \quad (3)
\]

\[
GOVF_{it} = \alpha + \beta EGOV_{it} + \delta gdp_{it} + \theta trd_{it} + \epsilon_{it} \quad (4)
\]

\[
REGQ_{it} = \alpha + \beta EGOV_{it} + \delta gdp_{it} + \theta trd_{it} + \epsilon_{it} \quad (5)
\]
where $CCOR, RLAW, GOVF, REGQ,$ and $VOIC$ represent control of corruption, the rule of law, government effectiveness, regulatory quality, and voice and accountability. Considering different governance indicators is crucial since it allows for assessing if e-government affects differently various governance indicators. The different governance indicators used in this research are obtained from the Worldwide Governance Indicators. The range of governance indicators is from -2.5 (worst) to 2.5 (best). The E-government index derived from the UN E-Government Knowledgebase proposed by the Division for Public Institutions and Digital Government (United Nations) is used to assess e-government development. We follow Al-Marhubi (2004) concerning control variables by introducing GDP per capita and trade openness. Indeed, the existing literature suggests that richer countries have better institutions, and consequently, it is anticipated that the coefficient $\delta$ in Equation 1 will be positive. Data are derived from the WDI database of the World Bank. Furthermore, it has been shown that trade openness improves governance as countries participating in international trade have better institutions due to increased competition in foreign markets (Ades & Di Tella, 1999). Therefore, the expected sign associated with the trade openness proxy is also positive. Trade openness is measured using the KOF trade globalization index suggested by KOF Swiss Economic Institute. Definitions and data points of variables are listed in Table 1.

### Table 1. Data abbreviations and sources

<table>
<thead>
<tr>
<th>Type</th>
<th>Abbreviation</th>
<th>Variable</th>
<th>Source</th>
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<tbody>
<tr>
<td>Dependent variable</td>
<td>$EGOV$</td>
<td>E-government index</td>
<td>UN E-Government Knowledgebase (United Nations)</td>
</tr>
<tr>
<td>Governance indicators</td>
<td>$CCOR$</td>
<td>Control of corruption</td>
<td>WGI (World Bank)</td>
</tr>
<tr>
<td></td>
<td>$RLAW$</td>
<td>Rule of law</td>
<td>WGI (World Bank)</td>
</tr>
<tr>
<td></td>
<td>$GOVF$</td>
<td>Government Effectiveness</td>
<td>WGI (World Bank)</td>
</tr>
<tr>
<td></td>
<td>$REGQ$</td>
<td>Regulatory quality</td>
<td>WGI (World Bank)</td>
</tr>
<tr>
<td></td>
<td>$VOIC$</td>
<td>Voice and accountability</td>
<td>WGI (World Bank)</td>
</tr>
<tr>
<td>Control variables</td>
<td>$TRD$</td>
<td>KOF trade openness index</td>
<td>KOF Swiss Economic Institute</td>
</tr>
<tr>
<td></td>
<td>$GDP$</td>
<td>GDP per capita</td>
<td>WDI (World Bank)</td>
</tr>
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</table>

### Empirical methodology

The empirical methodology involves many steps. We begin with a preliminary analysis of the sample considered in the analysis. To do this, we employ the homogeneity test introduced by Pesaran and Yamagata (2008) to investigate slope homogeneity between countries. Following this, we use a battery of tests, including the Scaled LM test produced by Pesaran (2021), the Breusch-Pagan LM test, the Bias corrected scaled LM test proposed by Baltagi et al. (2012), and the CD test developed by Pesaran (2007), to examine the CSD. Indeed, the validity of first-generation unit root tests is weakened when CSD is present. We, therefore, assess the stationarity of the data using a second-generation unit root test, namely the CIPS test proposed by Pesaran (2007) unit root test. The next step consists of testing the presence of long-run relationships based on a set of cointegration tests, such as the Pedroni (2004) and Kao (1999) cointegration tests (first-generation test) and
the Westerlund (2007) cointegration test (second-generation test). Finally, we assess the short- and long-run impacts of e-government on governance indicators using the PMG-ARDL technique, which allows for avoiding CSD problems. The different steps of the empirical methodology are reported in Figure 1.

**Figure 1.** Flowchart of the empirical study

### EMPIRICAL RESULTS

**Slope homogeneity analysis**

Panel data differs from time series in several ways, including potential problems that do not arise when working with time series. In this context, the heterogeneity issue is considered a crucial step in panel data. Accordingly, one should deal with this issue before exploring the linkages between e-government and governance. The findings of Pesaran and Yamagata (2008) slope homogeneity test are summarized in Table 2.

<table>
<thead>
<tr>
<th>Models</th>
<th>COR</th>
<th>RLAW</th>
<th>GOVF</th>
<th>REGQ</th>
<th>VOIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Δ</td>
<td>0.967 (0.333)</td>
<td>0.627 (0.531)</td>
<td>-0.570 (0.568)</td>
<td>1.521 (0.128)</td>
<td>0.827 (0.408)</td>
</tr>
<tr>
<td>Adjusted Δ</td>
<td>1.167 (0.243)</td>
<td>0.756 (0.449)</td>
<td>-0.688 (0.491)</td>
<td>1.835 (0.067)</td>
<td>0.998 (0.318)</td>
</tr>
</tbody>
</table>

Note: (.) denotes $p$-values.

The results show that both $\Delta$ and adjusted $\Delta$ statistics are not statistically significant at the 10% level for almost all considered models. This result indicates the existence of slope homogeneity across all countries and
for all governance indicators. This conclusion highlights the substantial institutional and governance similarity across the considered countries, which is explained by the fact that the countries under consideration have common institutional characteristics.

**Cross-section dependence analysis**

Given the presence of economic, financial, and cultural linkages between the MENA countries, it is essential to check the presence of CSD. Indeed, testing the CSD has become mandatory to select suitable unit root and cointegration tests. In the presence of CSD, one could not rely on first-generation tests to analyze the unit root and cointegration. In order to get robust results, we use various CSD tests, such as the scaled LM (PS-LM) test developed by Pesaran (2021), the Breusch-Pagan LM (BP-LM) test, the Bias-corrected scaled LM (BCS-LM) test suggested by Baltagi et al. (2012) and the Pesaran CD (PCD) test proposed by Pesaran (2007). The findings are summarized in Table 3.

<table>
<thead>
<tr>
<th>Variables</th>
<th>BP-LM</th>
<th>PS-LM</th>
<th>BCS-LM</th>
<th>PCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGOV</td>
<td>1136.374***</td>
<td>60.656***</td>
<td>60.125***</td>
<td>31.855***</td>
</tr>
<tr>
<td>CCOR</td>
<td>467.272***</td>
<td>20.086***</td>
<td>19.555***</td>
<td>2.034**</td>
</tr>
<tr>
<td>RLAW</td>
<td>538.549***</td>
<td>24.408***</td>
<td>23.876***</td>
<td>2.713***</td>
</tr>
<tr>
<td>GOVF</td>
<td>578.131***</td>
<td>26.808***</td>
<td>26.276***</td>
<td>2.535**</td>
</tr>
<tr>
<td>REGQ</td>
<td>673.440***</td>
<td>32.587***</td>
<td>32.055***</td>
<td>8.844***</td>
</tr>
<tr>
<td>VOIC</td>
<td>731.958***</td>
<td>36.136***</td>
<td>35.605***</td>
<td>9.798***</td>
</tr>
<tr>
<td>GDP</td>
<td>854.287***</td>
<td>43.552***</td>
<td>43.021***</td>
<td>1.427</td>
</tr>
<tr>
<td>TRD</td>
<td>554.886***</td>
<td>25.398***</td>
<td>24.867***</td>
<td>7.702***</td>
</tr>
</tbody>
</table>

Note: ** and *** denote the statistical significance at the 5 and 1% levels, respectively.

It is evident from Table 3 that CSD exists for all variables, as all probabilities of the four tests are less than 0.05. This result indicates that any shock affecting a variable in one country could spread to other MENA countries due to their geographic proximity and the multitude of agreements. In the presence of CSD, second-generation tests, such as Pesaran (2007) unit root test, must be used.

**Unit root analysis**

At this stage of the study, it is necessary to ensure the stationarity of the series using second-generation unit root tests. For this purpose, we use the CIPS test proposed by Pesaran (2007). The findings are reported in Table 4. Except for RLAW, REGQ, GDP, and TRD, the table reveals that variables are not stationary at their levels. However, when moving to the first difference of the series, the outcomes show that almost all the variables are stationary at the 1% statistical level. Consequently, all our variables are integrated of order zero or one. This finding suggests that e-government and governance may have a long-term cointegrating relationship. Additionally, since there are no variables integrated of order two, it is possible to implement the PMG-ARDL framework to get the long-run and short-run effects of e-government.
Table 4. CIPS unit root test results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level</th>
<th>1st difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGOV</td>
<td>-2.528</td>
<td>-3.291***</td>
</tr>
<tr>
<td>CCOR</td>
<td>-2.564</td>
<td>-3.584***</td>
</tr>
<tr>
<td>RLAW</td>
<td>-2.690*</td>
<td>-4.024***</td>
</tr>
<tr>
<td>GOVF</td>
<td>-2.393</td>
<td>-3.773***</td>
</tr>
<tr>
<td>REGQ</td>
<td>-3.075***</td>
<td>-4.366***</td>
</tr>
<tr>
<td>VOIC</td>
<td>-2.471</td>
<td>-4.063***</td>
</tr>
<tr>
<td>GDP</td>
<td>-2.801**</td>
<td>-3.193**</td>
</tr>
<tr>
<td>TRD</td>
<td>-3.155***</td>
<td>-4.637***</td>
</tr>
</tbody>
</table>

Note: *, **, and *** denote the statistical significance at the 10, 5 and 1% levels, respectively.

Cointegration analysis

We employ first- and second-generation cointegration tests to investigate the potential long-term relationship between the variables. We do the Pedroni (2004) cointegration and Kao (1999) tests, both of which belong to first-generation cointegration tests. Next, we conduct the Westerlund (2007) second-generation cointegration test that accounts for CSD. The findings are presented in Tables 5-7.

Table 5. Pedroni (2004) cointegration test results

<table>
<thead>
<tr>
<th>Models</th>
<th>CCOR</th>
<th>RLAW</th>
<th>GOVF</th>
<th>REGQ</th>
<th>VOIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel v-statistic</td>
<td>0.020</td>
<td>-1.870</td>
<td>-0.295</td>
<td>-2.320</td>
<td>-3.306</td>
</tr>
<tr>
<td>Panel rho- statistic</td>
<td>2.695</td>
<td>3.406</td>
<td>3.308</td>
<td>3.846</td>
<td>2.087</td>
</tr>
<tr>
<td>Panel PP- statistic</td>
<td>-1.382**</td>
<td>1.922</td>
<td>-0.396</td>
<td>1.700</td>
<td>-1.589*</td>
</tr>
<tr>
<td>Panel ADF- statistic</td>
<td>-2.950***</td>
<td>-0.136</td>
<td>-1.436*</td>
<td>1.592</td>
<td>-2.830**</td>
</tr>
<tr>
<td>Weighted panel v-statistic</td>
<td>-0.999</td>
<td>-2.211</td>
<td>-2.476</td>
<td>-3.156</td>
<td>-2.908</td>
</tr>
<tr>
<td>Weighted Panel rho- statistic</td>
<td>3.022</td>
<td>2.491</td>
<td>3.160</td>
<td>2.546</td>
<td>0.894</td>
</tr>
<tr>
<td>Weighted Panel PP- statistic</td>
<td>-1.700**</td>
<td>-0.760</td>
<td>-1.475*</td>
<td>-2.467***</td>
<td>-6.204***</td>
</tr>
<tr>
<td>Weighted Panel ADF- statistic</td>
<td>-3.382***</td>
<td>-2.368***</td>
<td>-3.950***</td>
<td>-0.651</td>
<td>-8.883***</td>
</tr>
</tbody>
</table>

Alternative hypothesis: common AR coefs. (Within-dimension)

<table>
<thead>
<tr>
<th>Models</th>
<th>CCOR</th>
<th>RLAW</th>
<th>GOVF</th>
<th>REGQ</th>
<th>VOIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group rho-Statistic</td>
<td>4.519</td>
<td>4.177</td>
<td>4.239</td>
<td>4.134</td>
<td>3.509</td>
</tr>
<tr>
<td>Group PP-Statistic</td>
<td>-4.557***</td>
<td>0.103</td>
<td>-1.956**</td>
<td>-5.068***</td>
<td>-3.632***</td>
</tr>
<tr>
<td>Group ADF-Statistic</td>
<td>-2.980***</td>
<td>-2.137**</td>
<td>-2.750***</td>
<td>-1.411*</td>
<td>-6.485***</td>
</tr>
</tbody>
</table>

Note: *, ** and *** denote the statistical significance at the 10, 5 and 1% levels, respectively.

Table 6. Kao (1999) cointegration test results

<table>
<thead>
<tr>
<th>Models</th>
<th>CCOR</th>
<th>RLAW</th>
<th>GOVF</th>
<th>REGQ</th>
<th>VOIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF stat.</td>
<td>-1.428*</td>
<td>-0.019</td>
<td>0.348</td>
<td>1.558*</td>
<td>-2.196**</td>
</tr>
<tr>
<td>p-value</td>
<td>(0.076)</td>
<td>(0.492)</td>
<td>(0.363)</td>
<td>(0.059)</td>
<td>(0.014)</td>
</tr>
</tbody>
</table>

Note: * and ** denote the statistical significance at the 10 and 5 levels, respectively.

The cointegration test findings from Pedroni (2004) and Kao (1999) are presented in Tables 5 and 6, respectively. The Pedroni cointegration test reveals divergent results. On the one hand, the outcomes show a cointegrating long-run relationship, especially when using the between-dimension version for all the models,
but this relationship disappears in some cases when using the within-dimension version. On the other hand, when models with voice and accountability, control of corruption, and regulatory quality were considered, Kao (1999) cointegration test confirmed the presence of a long-run relationship. Consequently, the first-generation cointegration tests almost suggest the presence of long-run linkages between e-government and governance. However, since we already understood that CSD was present in the data, the cointegration proposed by Westerlund (2007) is more relevant.

Table 7. Westerlund (2007) cointegration test results

<table>
<thead>
<tr>
<th>Models</th>
<th>Gt</th>
<th>Ga</th>
<th>Pt</th>
<th>Pa</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCOR</td>
<td>-6.112** (0.017)</td>
<td>-1.423 (0.991)</td>
<td>-7.534** (0.022)</td>
<td>-2.071 (0.968)</td>
</tr>
<tr>
<td>RLAW</td>
<td>-3.641** (0.031)</td>
<td>-1.555 (0.998)</td>
<td>-9.680** (0.025)</td>
<td>-1.898 (0.978)</td>
</tr>
<tr>
<td>GOVF</td>
<td>-3.524** (0.011)</td>
<td>-1.682 (0.997)</td>
<td>-9.665* (0.085)</td>
<td>-1.449 (0.999)</td>
</tr>
<tr>
<td>REGQ</td>
<td>-3.650** (0.010)</td>
<td>-0.912 (0.999)</td>
<td>-4.023*** (0.009)</td>
<td>-0.972 (0.999)</td>
</tr>
<tr>
<td>VOIC</td>
<td>-3.351*** (0.000)</td>
<td>-1.194 (0.997)</td>
<td>-4.325** (0.022)</td>
<td>-1.012 (0.992)</td>
</tr>
</tbody>
</table>

Note: *, ** and *** denote the statistical significance at the 10, 5 and 1% levels, respectively. (.) Denotes probability values.

Table 7 shows that there was a long-term relationship between the variables for the five models that included both Gt and Pt variations. These two variants of the Westerlund (2007) test are computed using estimated standard errors of the error correction term, as opposed to Ga and Pa, which are computed using Newey and West standard errors (Westerlund, 2007; Hicham, 2019). Consequently, the findings confirm the existence of a long-term association between GDP, trade openness, e-government, and all governance indicators.

**PMG-ARDL estimation results**

The next step consists of estimating the long-run and short-run impacts of e-government on the five governance indicators using the PMG-ARDL technique, which is suitable for our data given the existence of CSD, unit root, and long-run association. The results are summarized in Table 8. According to the findings, there is a positive long-term impact of e-government on the control of corruption, with a 10% increase in the e-government index resulting in a 1.1% reduction in corruption. These findings are in line with those of Andersen (2009), Zhao and Xu (2015), and Chen and Aklikokou (2021). One possible explanation for this finding is that e-government is associated with more government transparency, which prevents corruption. Results also suggest that e-government has a long-term, positive impact on the rule of law, with a 10% increase in the e-government index leading to a 2.26% increase in the rule of law. This effect could be explained by the fact that the modernization of public administration by shifting from paper-based to electronic operations results in more transparent services and reduces mismanagement and bureaucracy. By doing so, e-government will improve citizens' confidence in the judicial system, property rights, and the quality of contract enforcement. On the other hand, the results show that coefficients associated with regulatory quality, government effectiveness, and voice and accountability are not statistically significant. These findings imply that e-government development does not affect these institutional indicators in the long-run. These results do not corroborate those of Nam (2019), who concluded that the e-government improves government effectiveness.
The results also suggest a positive long-run impact of the gross domestic product on government effectiveness and regulatory quality. Increasing GDP by 10% leads to a long-term increase in government effectiveness of 1.57%.

### Table 8. PMG-ARDL estimation results

<table>
<thead>
<tr>
<th>Models</th>
<th>CCOR</th>
<th>GOVF</th>
<th>RLAW</th>
<th>REGQ</th>
<th>VOIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Long-run estimation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>0.018</td>
<td>0.157***</td>
<td>0.048</td>
<td>0.080*</td>
<td>-0.048***</td>
</tr>
<tr>
<td>TRD</td>
<td>-0.034</td>
<td>-0.197***</td>
<td>0.014</td>
<td>0.597***</td>
<td>0.600***</td>
</tr>
<tr>
<td>EGOV</td>
<td>0.110***</td>
<td>-0.078</td>
<td>0.226***</td>
<td>-0.116</td>
<td>0.030</td>
</tr>
<tr>
<td><strong>Short-run estimation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECT</td>
<td>-0.561***</td>
<td>-0.397***</td>
<td>-0.361***</td>
<td>-0.540***</td>
<td>-0.461***</td>
</tr>
<tr>
<td>D (EGOV)</td>
<td>-0.262</td>
<td>0.147</td>
<td>-0.187</td>
<td>0.531**</td>
<td>-0.156</td>
</tr>
<tr>
<td>D (EGOV (-1))</td>
<td>0.303</td>
<td>0.408</td>
<td>0.072</td>
<td>0.380</td>
<td>0.128</td>
</tr>
<tr>
<td>D (GDP)</td>
<td>-0.026</td>
<td>0.237</td>
<td>0.427**</td>
<td>0.476*</td>
<td>-0.566</td>
</tr>
<tr>
<td>D (GDP (-1))</td>
<td>-0.106</td>
<td>0.083</td>
<td>0.124</td>
<td>0.658***</td>
<td>-0.337</td>
</tr>
<tr>
<td>D (TRA)</td>
<td>0.257</td>
<td>0.063</td>
<td>0.288</td>
<td>-0.142</td>
<td>-0.107</td>
</tr>
<tr>
<td>D (TRA (-1))</td>
<td>0.166</td>
<td>0.007</td>
<td>0.340**</td>
<td>-0.143</td>
<td>0.059</td>
</tr>
<tr>
<td>D (COR (-1))</td>
<td>0.105</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>D (GOVF (-1))</td>
<td>-</td>
<td>-0.097</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>D (RLAW (-1))</td>
<td>-</td>
<td>-</td>
<td>0.115</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>D (REGQ (-1))</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.003</td>
<td>-</td>
</tr>
<tr>
<td>D (VOIC (-1))</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.010</td>
</tr>
<tr>
<td>Constant</td>
<td>2.154***</td>
<td>1.321***</td>
<td>1.154***</td>
<td>0.411***</td>
<td>0.673***</td>
</tr>
</tbody>
</table>

Note: *, ** and *** denote the statistical significance at the 10, 5 and 1% levels, respectively.

This conclusion supports the findings of Lee and Whitford (2009) and Garcia-Sanchez et al. (2013). This is because economic growth and increased government revenues allow countries to enhance the quality of their public services and institutions. Additionally, economic growth allows for improving the quality and credibility of policies. The results also show that trade openness can be an important key to improving regulatory quality and voice and accountability in the long-run by about 6% for every 10% increase in trade openness. The results also show that the e-government index positively affects regulatory quality in the short-run. According to these results, e-government boosts regulatory quality in the short-term by facilitating the development and implementation of policies and regulations that encourage private sector growth. The outcomes also indicate that economic growth improves the rule of law and regulatory quality in the short-run. Another important issue from Table 8 is the negative and statistically significant error correction term, which ranges between – 0.361 and –0.561 for the five models, indicating an adjustment process following shocks affecting the long-run equilibrium between the variables.

**CONCLUSIONS AND POLICY RECOMMENDATIONS**

The purpose of the current research is to investigate the effects that e-government has had on governance in a sample of 17 MENA countries between 2003 and 2019. To check the robustness of results, the empirical
analysis considers a wide range of governance indicators. On the hand, the e-government index developed by the UN E-Government Knowledgebase is used as a proxy for e-government adoption. The methodology uses advanced unit root and cointegration tests and the PMG-ARDL technique.

The findings may be summarized as follows. The preliminary analysis reveals the existence of slope homogeneity and CSD among variables. The CIPS second-generation unit root test reveals that variables are integrated of order zero or one. In addition, the Kao (1999) and Pedroni (2004) cointegration tests almost suggest the presence of long-run relationships between e-government and the different governance indicators. The second-generation cointegration test suggested by Westerlund has been used to confirm these findings (2007). Given the existence of long-run cointegrating relationships, we move to estimate the long-run and short-run effects of e-government on governance using the PMG-ARDL technique. The findings indicate that e-government has only a positive effect on the control of corruption and the rule of law, with no substantial effects on voice and accountability, government effectiveness, or regulatory quality. In addition, the analysis demonstrates that a 10% adoption of e-government results in a 1.1% decrease in corruption and a 2.6% increase in the rule of law in the long-run. The short-run analysis reveals that e-government has no statistically significant effects on governance. Consequently, the PMG-ARDL technique indicates that the impact of e-government on governance is only observed in the long-run.

The outcomes of this research have some policy recommendations. First, the findings highlight the critical role of e-government in improving institutional quality in MENA countries in the long-run. As a result, policymakers should be aware that implementing e-government practices and changing to electronic operations is a lengthy process that must be completed to promote the rule of law and lessen corruption. This demonstrates the importance of gradually transitioning to e-government practices to reduce corruption and improve the rule of law within MENA countries in the long-run. Furthermore, our findings show that e-government has no significant effects on voice and accountability, regulatory quality, and government efficiency. Therefore, a strategy that combines the adoption of e-government with other governance-enhancing initiatives may be effective at materializing the repercussions of e-government on voice and accountability, government efficiency, and regulatory quality.

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Conceptualization, M.S.R. and M.A.S.; methodology, M.A.S.; software, M.A.S.; validation, M.S.R. and M.A.S.; formal analysis, M.S.R.; investigation, M.S.R.; resources, M.S.R.; data curation, M.A.S.; writing - original draft preparation, M.S.R. and M.A.S.; writing - review and editing, M.S.R. and M.A.S.; supervision, M.S.R.; project administration, M.S.R.; funding acquisition, M.S.R. All authors have read and agreed to the published version of the manuscript.

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ACHIEVEMENT MOTIVATION AMONG THE LATVIAN RESIDENTS OF DIFFERENT TYPES PROFESSIONS AND OCCUPATIONS

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ABSTRACT

The article explores theoretical insights about the complex concept of achievement motivation. The authors adapted research methodology for the purpose of this study to explore the motivation for the achievements of Latvian population. The authors have conducted a detailed empirical study by examining various types of occupations or professions of inhabitants of Latvia and have formulated conclusions on the motivation for the achievements for this particular sample. The aim of the study was to explore the motivation for the achievement of Latvian population. The authors have set the following question: Are there any differences in motivation for achievement for both genders? In total, 160 respondents in the age group from 18 to 68 have participated in this study (M=37.51; SD=14.15) who were residents from different regions of Latvia. A random sample was used to select the respondents for this study.

Reean's survey “Motivation for Success and Fear of Failure” (adapted from Iljin (2004) was used to determine the content of achievement motivation. Data processing for this empirical study was carried out by the use of data processing program SPSS (Statistical Package for the Social Science) version 22.0.

Methods of statistical data analysis: Student's t-test was carried out to identify statistically significant differences between Means in a single sample; Chi-Square tests (χ²); parametric one-way analysis of variance ANOVA; Kruskal-Wallis rank-sum H-test, descriptive statistics was carried out in the framework of this study.

The main results of the study: by integrating theoretical insights and the results of research conducted in the 20th and 21st centuries, a theoretical holistic model was designed, which could be considered as the basis of the content of achievement motivation. There is no statistically significant dependence between the motivation for achievement and the type of occupation or profession in the selected sample of inhabitants of Latvia.

Keywords: motivation, achievement motivation, failure motivation, success motivation

JEL classification: 0011; 0035; Z10; Z13

Paper type: Research article

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INTRODUCTION

Motivation is a complex human construction that has caused difficulties for those who are trying to understand it. The concept of motivation has always been the focus of study by the researchers and experts in the field of social sciences. The first studies were related to the content of the concept of achievement motivation and were launched in the 20th century. McClelland (McClelland, 1985) has tried to identify indicators of achieving various types of activity. There are number of studies that indicate to a social and intellectual significance of
a higher or lower level of achievement. According to McClelland, the higher is motivation, the more rational is the need for achievement of an individual. It was also concluded that achievement motivation as a personal contribution is determined by goals, activity, expectations, incentives, internal as well as external motivation and alternatives chosen by an individual. According to Heckhausen (Heckhausen, Schmalt & Schneider, 1985), achievement motivation should be understood not as the main reason for behavior, as it was accepted in psychology, but rather as a concept that describes the dynamics of the interaction of several factors. The term is related to a person's specific interaction with the environment, including his or her experience in setting goals and behaviour. The motivation for achievement in this context can be formulated as the development of the person's own personality and readiness to rearrange activity according to changing realities of life, as well as a tendency of building and planning the growth of one's career throughout one's life. The studies carried out by Heckhausen McClelland and other psychologists indicate that there are various interrelated factors of achievement motivation that cannot be viewed separately from each other in order to objectively determine the content of achievement motivation. Today, the concept of achievement motivation includes rich content and but it is understood as a purposeful and meaningful development of life of a person (Kalabina et al., 2021; Avdeeva et al., 2021). This is the development of a person as a personality and readiness to rearrange himself or herself according to the changing realities of life, by building and planning the growth of one’s career throughout life. The potential of each person is closely related to one’s own choice to believe in one’s dreams and desire to implement them. Several contemporary researchers (McGillivray, Murayama & Castel, 2015; Miele & Scholer, 2018) have conducted a series of experiments to test how different types of motivation affect both learning and activity in general, while looking for answers to the question: how employee’s motivation affects the success of the company. Thus, achievement motivation is a set of gifts, abilities and actions that make people engage in certain behaviors. The process of motivation begins with the determination of the goal and one’s own abilities, as well as the assessment of resources and circumstances. In the scientific literature, both internal and external factors affecting career choices are distinguished. An important aspect in the motivation of an individual’s achievements are internal factors: the internal potential of an individual and the sources of action that are related to one’s personality. Felzer (Felzer, 2006) defines motivation as a need or a desire that stimulates and directs one’s behavior.

From the scientific point of view, the power that guides a person is located not only in the environment, but in the interaction with the environment. Motivation always depends more on internal state, internal stimuli and motives, as well as external motives and modifies the behavior of the subject in the process of his or her activity. However, the behavioural approach is limited because it emphasizes more external motivating factors (praise, good grades, rewards, etc.) that can generate certain disadvantages. A large number of empirical studies (Dörnyei, 2005; Mercer & Williams, 2014; Wang, 2017; Kurmanov et al, 2019; Petrova, Tepavicharoa, Dikova, 2019) support the idea that has a great influence on the motivational state and future performance of employees. The same applies to the motivating effect produced by the (public) recognition of employees for their efforts and work achievements, since it gives a positive signal about one's competence in
relation to others, which increases self-esteem and causes positive impact (Wang, 2017). As a result, employees are motivated to achieve high level of performance in order to increase their chances of receiving recognition.

With the regard to motivation, Dornwei (Dörnyei, 2005) states that people are motivated to address the perceived discrepancy between their current sense of self and their future self. One way is to approach one's vision of an ideal self, and the other way is to prevent the development of negative aspects of oneself, such as a feeling of failure or disappointment or to upset others. One way is to get closer to one’s vision of the ideal self, and the other way is to prevent the development of negative aspects in oneself, such as a feeling of failure or disappointment of important people.

Similar studies that are focusing on the personality in its various forms highlight the role of positive self-confidence, a sense of competence, a growth mindset, and the associated optimism about the potential for positive changes to develop one's abilities (Mercer & Williams, 2014).

This approach emphasizes the importance of achieving positive future goals and necessary level of optimism capable of changing and potentially achieving future goals, as well as the strategic knowledge that is needed to achieve future goals.

Thus, the way towards achievement allows the individual to reach results, as well as to experience satisfaction in the process of achieving the goal. This can also be judged that the motivation for achievement in this context is based on personality orientation, which is based on the goal of fulfilment of tasks.

In this context, several studies have also recently been carried out (Wietrak, Rousseau & Barends, 2021) that are focusing on motivation of the employee's daily work. Job motivation was studied in relation to the need or reason(s) why employees put their efforts to perform their daily work to the best of their ability. It was discovered that positive feedback increases perceived competence and contributes to the internal motivation of employees.

According to the researchers published in the 20th and 21st centuries, the motivation for achievement is influenced by many different factors, including the internal physiological state of the organism and current environmental conditions. Thus, achievement motivation can be defined as a complex concept, the content of which is formed by several components and factors.

Based on the theoretical recognition of the above-mentioned researchers on the motivation for achievements, a theoretical model has been designed (Figure 1).

As a result of analyses of theories described above, this could be stated that theoretical and contextual justification of the concept of achievement motivation consists of:

1. the content of definitions based on constructs such as one’s enthusiasm for action to meet one’s needs;
2. the content of definitions that determine the direction of activity is based on balanced external and internal motives;
3. the content of definitions is based on achievement motivation as orientation, motivation for activities that meet the needs of the subject;
4. as a set of conditions that cause activity. In this study, the substantive aspects of the concept of achievement motivation is based on the interpretation of the concept of success (as a goal) by Heckhausen, Schmalt and Schneider (Heckhausen, Schmalt & Schneider, 1985), the content developed by McClelland's (McClelland, 1985) theory of achievement motivation: on people's dedication to success or in order to avoid loss, which is determined by the intensity of a motive itself. The paper continues with the description of methodology that was used to measure the motivation for the achievements of Latvian population in relation to the research question: Are there differences in motivation for achievement for both genders?

**METHODOLOGY**

The study was conducted from September 2022 to April 2023. Reans' survey "Motivation for success and fear of failure" (Iljin, 2004, 515) was adapted for the purpose of the study on the motivation for the achievements among the Latvian population.

The preparation process has started with the adaptation of this survey for a specific sociocultural population – the residents of Latvia. The adaptation process was associated with the translation of the Rean’s survey and adaptation of the content.
The examination of the characteristics of psychometry was carried out according to the internationally recognized procedure. Both face-to-face and off-site surveys were conducted in the e-environment. The structure of the survey included demographic information about the respondents’ age, gender and socio-economic status and the type of occupation or profession of respondents. Before filling in the questionnaire, the participants filled in the consent agreement and were informed about the confidentiality of their data and voluntary participation in the study. During the study, anonymity, confidentiality and ethics of the research was observed in regards to all that participants involved in this study.

The methodology included instruction, the text, instruction for processing and interpreting results. In total, 160 (N=160 (100%)) respondents participated in this study: among them were residents from different regions of Latvia in the age range from 18 to 68 years (M=37.51; SD=14.15); including female (n=101 (63.1%)) and male (n=59 (36.9%) participants. For all statistical criteria used, p-level (level of statistical significance) was measured and was equal to 0.05, that is considered to be acceptable marginal error of all results gathered in general sample. $0.05 < p < 0.1$, dependencies are considered at the level of statistical significance.

**RESULTS AND DISCUSSION**

In the course of study, four groups of respondents were distinguished according to their type of occupation or profession. Klimov (Klimov, 1998) has distinguished the following types of professions and marked them with certain letters:

- **Human being – living nature** (D). The representatives of this type work with plants and animals and in the conditions necessary for them. For example: a baker, an agronomist, a zootechnician, a veterinarian, a microbiologist, a forester;
- **Human being – technique and inanimate nature** (T). This group is comprised of employees who work with lifeless, technical objects. For example, a technician-mechanic, an engineer-a mechanic, an electrical locksmith, an engineer-electrician, a technician-catering technologist;
- **Human being – human being** (C). This group includes professions related to the social system as a whole – social groups, societies, population. For example: a seller, a hairdresser, an administrator, a doctor, a teacher;
- **Human being – sign system** (Z). The representatives of this type of profession work with languages, signs, symbols, numbers and formulas. For example, a photographer, a programmer, a draftsman, a mathematician, publishing editor, a linguist;
- **Human being – and artistic image** (M). This group includes professions related to phenomena, events, facts that are related to arts. For example: a decorator, a restorer, a tuner of musical instruments, musician, a ballet artist, a dramatic theatre actor.

The division into four groups according to the above-mentioned differentiation as suggested by Klimov was used for the purpose of this study.
The data obtained as a result of the survey allow to divide all respondents into four groups according to their type of occupation or profession:

1. **Human being – nature** (referred to as (D)) - a farmer, a janitor, veterinarian, biologist.
2. **Human being – non-living nature** (referred as (T)) – a welder, a car mechanic, a carpenter, a builder, a finishing worker, an engineer, a truck driver, a cleaner.
3. **Human being – human being** (referred as (C)) - a teacher, a coach, a doctor, a pupil, a student, a seller, the head of an educational institution, the head of a bank department, a project coordinator, an entrepreneur.
4. **Human being – sign language** (referred as (Z)) – IT specialist, an economist, a clerk, an accountant, a librarian.

For the analyses of the results obtained in this study, further abbreviated letters were used in the study: for the group 1 - D; for the group 2 - T; for the group 3 - C, For the group 4 - Z.

The following division into groups according to the type of occupation or profession can be singled out:

1. 15 (9.4%) respondents were identified in the group 1 (D);
2. 21 (13.1%) respondents were identified in the group 2 (T);
3. 105 (65.6%) respondents were identified in the group 3 (C);
4. 19 (11.9%) respondents were identified in the group 4 (Z).

Among four groups mentioned above, the respondents from groups D (0%), T (0%) and Z (0%) have the lowest failure motivation scores and they fall into the first of the three thematically related groups. The highest rates of motivation for failure are among the respondents of the third group C (6 people are rated by 100%).

In the second group, the lowest indicators that do not have a pronounced motivation pole were 4 (5.5%) of respondents from the first group D that derive out of the three thematically related groups.

**Motivation**

![Motivation Diagram](source)

**Figure 2.** Distribution of respondents from four groups (D, T, C, Z) in three thematically related groups displaying motivation

*Source: Author’s illustration*

46 (63%) respondents from the third group C had the highest rates of motivation.
In the third of the three thematically related groups, the lowest success motivation scores were 8 (9.9%) for respondents from group Z. Achievement motivation scores were the highest among 53 (65.4%) respondents from the third group C (Figure 2).

The level of statistical significance of the Chi-square criterion (Chi-Square test ($\chi^2$)) is $p=0.26$ ($p>0.05$). This indicates that there is no statistically significant relationship between two qualitative characteristics: motivation of Latvian population (content of 3 thematically related groups) and type of occupation or profession of respondents. These signs do not affect each other.

Since the qualitative results of the study did not reflect statistically significant differences between the motivation of the inhabitants of Latvia and their age, gender and type of occupation or profession, the description of quantitative research results on the motivation of the Latvian population (three thematically related groups that describe the degree or limits of motivation) is further analysed.

The quantitative average size within each thematically related groups was also analysed according to the type of occupation or profession of respondents, which characterize the motivation of the Latvian population: in group 1 (D) – 14.33; in the 2nd group (T) – 12.9; in group 3 (C) – 13.19; in group 4 (Z) – 13.47 (Figure 3).

![Figure 3. Average (Mean) within each of thematically related groups](Source: Author's illustration)

The motivation of respondents, indicate that:

- For the respondents of the 1\textsuperscript{st} group Human being - nature (D) the motivation pole is not expressed; there is more pronounced tendency towards a motivation for achievement than in the rest of the groups; there is a desire among the respondents towards success;

- For the respondents of group 2 Human being - non-living nature (T) - the motivation pole is not expressed; there is a tendency towards a motivation for failure, there is a tendency towards success (achievement motivation); for the respondents' motivation s is the tendency to avoid failures;
- For the respondents from group 3 *Human being – human being* (C) the motivation pole is not expressed clearly; it tends towards achievement motivation, however, it is weaker than that for the respondents of group 4;

- For respondents of the 4th group *Human being - sign language* (Z) - the motivation pole (difference) is not expressed; it tends towards achievement motivation, however, it is weaker than for respondents of group 1. In the course of the study, it was discovered that the type of occupation or profession of the respondents has a connection with the degree of motivation for success. Quantitative averages within each group, which were divided in the course of the study, by type of occupation or profession of respondents (*Human being-nature; Human being-non-living nature; Human being-human being; Human being-sign language*), indicates that the motivation for success of respondents in all four groups is evaluated as average. However, it should be stated that for the respondents of the first group (*Human being - nature*) the indicator is more expressive. In order to compare the average of the quantitative characteristics to be measured – the motivation of the respondents and their type of occupation or profession – a one-factor variance analysis (ANOVA) was carried out. According to the results of parametric one-factor variance analysis (ANOVA), no statistically significant differences between the motivation of the Latvian population and the type of occupation or profession have been found (F=0.83; p>0.05). According to the quantitative average within each thematically related group, by gender of the respondents and belonging to one of the four (D, T, C, Z) groups, is found: (1) the average size for the male respondents is lower than that of female respondents in three groups: first, third and the fourth (D, C, Z); (2) only the second group matched the average indicator for both male and female respondents (T) (Figure 4).

**Estimated Marginal Means of Motivation**

![Figure 4](https://journal.access-bg.org/)

**Figure 4.** Motivational averages of respondents of four groups of different sexes within each thematically related groups

*Source: Author’s illustration*
The analyses of the results of an empirical study indicate that in three groups (D, C, Z) the more pronounced motivation is among female respondents. In the second group (*Human being - non-living nature (T)*) there was no connection among female and male respondents. The comparison of averages, parametric one-factor variance analysis (ANOVA) was used as well. According to the results of parametric one-factor variance analysis (ANOVA), a comparison of averages of those groups of respondents, which characterize the dependence of respondents' motivation on the gender by belonging to one of the four groups (in relation to their type of occupation or profession), the following has been discovered:

- there is no statistically significant difference between indicators of motivation (in relation to three thematically related groups) and male gender (F=0.79; p>0.05);
- there is no statistically significant differences between motivation (in relation to three thematically related groups) and female gender (F=1.27; p>0.05) (Table 1).

**Table 1.** Comparison of MEAN describing dependence of motivation of respondents according to a gender of respondents who belong to one of the four groups (ANOVA)

<table>
<thead>
<tr>
<th>Gender</th>
<th>F criterium</th>
<th>P (Significant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>0.79</td>
<td>0.50</td>
</tr>
<tr>
<td>Female</td>
<td>1.27</td>
<td>0.28</td>
</tr>
</tbody>
</table>

According to the t-test criterion, there are no statistically significant differences between respondents' motivation (according to three thematically related groups) and their occupation or occupation (F=1.25; p>0.05) (Table 2).

**Table 2.** Comparison of mean by t-test criterion

<table>
<thead>
<tr>
<th>Occupation or profession</th>
<th>T kritērijs</th>
<th>P (Significant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human being – nature (D)</td>
<td>1.25</td>
<td>0.23</td>
</tr>
<tr>
<td>Human being - non-living nature (T)</td>
<td>-0.12</td>
<td>0.90</td>
</tr>
<tr>
<td>Human being – human being (C)</td>
<td>1.57</td>
<td>0.11</td>
</tr>
<tr>
<td>Human being- sign language (Z)</td>
<td>1.67</td>
<td>0.11</td>
</tr>
</tbody>
</table>

The answers to the research question - *Are there differences in motivation for achievement for both genders?* – the motivation for achievement was compared by the type of occupation or profession of respondents. When applying the Kruskal-Wallis rank-sum H - test, the following relationships was found between the motivation of respondents' achievements and the type or profession of occupation:

For respondents from the 1st group *Human being - nature (D)* - the average rank of motivation for achievement is higher than in other groups (98.80);

1) For the respondents of group 2 *Human being – non-living nature (T)* - the average rank of achievement motivation is the lowest (70.62);
2) For the respondents of group 3 Human being – human being (C) - the average rank of achievement motivation is higher than among the respondents of the second group (80.06), however, lower than among the respondents of the first and fourth groups;

3) For the respondents of group 4 Human being - sign language (Z) - the average rank of achievement motivation is higher than that among the respondents of the second and third groups (79.39), however it is lower than among the respondents of the first group (Table 3).

<table>
<thead>
<tr>
<th>Way of occupation</th>
<th>Mean rank</th>
<th>n</th>
<th>df</th>
<th>$\chi^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motivation for the achievement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human being – nature (D)</td>
<td>98.80</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human being – non-living nature (T)</td>
<td>70.62</td>
<td>21</td>
<td>3</td>
<td>3.355</td>
<td>0.34</td>
</tr>
<tr>
<td>Human being – human being (C)</td>
<td>80.06</td>
<td>105</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human being – sign language (Z)</td>
<td>79.39</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The comparison of achievement motivation indicators of the type of occupation or profession of respondents as a result of the use of use of Kruskal-Wallis rank-sum H – test (p>0.05).

**DISCUSSION AND CONCLUSIONS**

A number of researchers viewed motivation for achievement only by a piecemeal approach by exposing to a certain type of activity. Since the construct of "motivation" is quite abstract, it is often being associated with a specific activity (for example, motivation to work from home or motivation to participate in organizational changes) or a specific result (for example, the performance on a task or producing an innovation).

Despite the fact that previous studies have focused mainly on the failure as a component of the content of achievement motivation, variables such as a specific type of occupation or profession of respondents were not always discouraged, nor were focused on the motivation of the achievement of a population as a whole, including three dependent variables: age, gender, occupation type or a profession. Three dependent variables as mentioned in the given study were explored on the basis of the answers provided in the survey by Latvian residents.

Today, only certain types of occupations and professions are explored in the context of motivation for achievement. In this study, such socio-demographic parameter as the type of occupation or occupation of the population of Latvia were considered. The content of the motivation for the achievements of respondents was studied according to their type of occupation or profession. The analyses of theoretical knowledge about the issue of study allows the authors can conclude the following: there are no single theories or concepts about the motivation for achievement. Instead, there are several approaches that derive from the aspects related to the
theories mentioned above. The complex content of achievement motivation helps to recognize that the satisfaction of needs was associated with inspiration, ideals, values and positive results.

This can be concluded that statistically significant differences between the motivation for the achievements of the Latvian population and the type or profession of occupation or profession does not exist (p=0.34; p>0.05). The results of the empirical study can be interpreted in relation to the content aspects of the organization of activity.

Further research could be carried out because there is a lack of research in general on the motivation for the achievements among the population of Latvia. This is advised to involve a larger sample of population in the study in order to explore such factors as education, personality traits, and etc.

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All authors have read and agreed to the published version of the manuscript.

**Institutional Review Board Statement:** not applicable

**Informed Consent Statement:**
Informed consent was obtained from all the participants involved in the study.

**Data Availability Statement:**
The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy issues.

**Conflict of interests**
The authors declared no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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SUSTAINABLE TOURISM IN THE POST-WAR RECONSTRUCTION OF TERRITORIAL COMMUNITIES IN UKRAINE

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ABSTRACT
The tourism industry appeared to be one of the most vulnerable to the full-scale invasion of the Russian Federation in Ukraine. The losses of the Ukrainian tourism economy during the war significantly exceeded the losses caused by the coronavirus pandemic. The lack of tourist flows to Ukraine, the outflow of investments from the tourism sector, the high level of danger of staying in many regions of the country, the destruction of the tourist infrastructure has become key challenges. In 2022, the revenues of the State Budget of Ukraine from the tourism industry decreased sharply. The incompleteness of the administrative-territorial reform, financial insufficiency, and the unprecedented outflow of human resources with significant losses in the tourism industry actualize the scientific search for reducing the negative consequences of the current crisis.
The article aims: To substantiate, on the concept level, effective management approaches to the economic, ecological, and social development of sustainable tourism, as one of the directions for the restoration of territorial communities in the post-war period.
Methods/Approach: Using economic and statistical methods, the article provides an assessment of the country’s domestic economy, which is characterised by a decrease in the volume of real gross domestic product by 11.4% in the first year of the war compared to the previous one, a reduction in real wages, and an increase in unemployment. The use of methods of analysis and synthesis made it possible to assess the damage caused to the regions of Ukraine and to identify trends in the development of territorial communities and the tourism sector.
Results: The analysis of statistical reports proves that tourism and hospitality development in 2017-2020 (a pre-crisis period for the named industries) required harmony of interests between tourism business entities and local territorial communities. The hypothesis has been confirmed that sustainable development of tourism will stimulate the post-war recovery and evolution of territorial communities. A cluster-based approach to the initiation of tourism development programs is proposed with congregating territorial communities into four groups depending on the consequences of hostilities and selection of specific focus areas. A "win-win" strategy is suggested as a conceptual background for effective management of the territories' restoration and development based on harmonisation of interests between territorial communities and business.
Conclusions: The study is relevant from the point of view of solving the problems of financing the social and economic development of territorial communities through the activation of resources and the creation of a more stable and favorable environment for sustainable tourism.

Keywords: tourism, sustainable development, territorial communities, harmonisation of interests, tourist destinations

JEL classification: K23; L83; L88; R58; Z32
Paper type: Research article.

INTRODUCTION

The national strategic framework of sustainable development goals for Ukraine is based on the UN Summit plan of action "Transforming our world: an agenda in the field of sustainable development until 2030", adopted at the 70th session of the UN General Assembly, which approved 17 Sustainable Development Goals and 169 tasks (Transforming our world: the 2030, 2015).

In Ukraine, the Tourism and Resorts Development Strategy for the period until 2026 (2017) is implemented, which states that tourism is one of the main industries that affects the general state and trends of the world economy under the conditions of transformational changes and its integration into the world community. The State Strategy for the Regional Development of Ukraine for 2021-2027 (2020) have defined the tasks that ensure the achievement of strategic goals (such as promoting the development of tourist infrastructure in rural areas, implementing the development of the recreational and tourist potential of coastal areas on the basis of inclusiveness, broad involvement of territorial communities in planning and implementation of development projects) remain relevant in the post-war period and correspond to the main tasks of the Recovery Plan of Ukraine (2023). Being a part of the other national programs implementation, these projects aim at the reconstruction of tourist infrastructure, the development of domestic and inbound tourism, the creation of a network of tourist information centres, institutional support of tourism enterprises and further business development.

Implementation of the above-mentioned strategic goals is possible if the paradigm of sustainable development is applied. The EU principles of sustainability including the environmental, economic and socio-cultural aspects of tourism development can work as a template for the proper balance between these three dimensions and guarantee the long-term sustainability of tourism progress in Ukraine.

As a result of the reform, 1,469 territorial communities were formed in Ukraine (including 31 territorial communities in uncontrolled territory within the Donetsk and Luhansk regions). The largest number of territorial communities is in Odesa (6.19%), Dnipro (5.85%), Lviv (4.97%) and Kyiv (4.7%) regions.

The war in Ukraine had a negative impact on all sectors of the economy, including tourism. The state budget of Ukraine lost about 30% of revenues from the tourism industry in 2022 (Ministry of Finance, 2023). Several state programs provide for the recovery of Ukraine's economy, including tourism development. Therefore, the purpose of the study was to substantiate proposals aimed at revitalising the sustainable development of domestic tourism as a tool for the restoration and evolution of territorial communities in Ukraine.

METHODOLOGY

The methodological basis was the application of: an abstract-logical method for summarizing the theoretical foundations of the development of sustainable tourism; analysis and synthesis - to determine the economic state of the country and the tourist potential of the territories; economic and statistical - for dynamic analysis of socio-economic development of territories; cartographic - to assess the concentration of territorial communities of Ukraine; forecasting - to determine the country's development trends based on key economic
indicators; logical and comparative analysis - to form reasonable conclusions based on research results.

**MAIN RESULTS**

Local economic development, which is the basis of global sustainable development, is, according to the definition of the World Bank (World Bank, 2023), a process of joint work of community residents to achieve sustainable economic growth, which will bring economic benefits and improve the quality of life for all members of the community.

The economic development of territorial communities (local economic development) is determined by a strategic partnership between business structures and local communities, which helps to accelerate the rate of growth of the main activity indicators for the community and business units, ensuring an increase in investments in new and existing enterprises, – that is determined by a high degree of harmonisation of interests between communities and business environment (Di Virgilio et al., 2023).

The influence of tourism companies, as the principal manufacturers of a tourist product, on local economic development, at the level of territorial communities and regions, in one respect, is determined by the increase in budgetary tax revenues (including the boost of the tourist tax). At the same time, tourism development directly affects business evolution in hospitality (hotel, restaurant, and entertainment industry), transport, retail trade, local industries etc., the business entities of which, in turn, increase tax revenues to the budget and create jobs for community residents (Dorokhov et al., 2023). All this makes it possible to fulfil the main goals of the sustainable development of a country (Ukraine 2030. The Doctrine of Sustainable Development, 2018), such as increasing the level of employment and welfare of the population, which leads to overcoming poverty and ensuring a decent standard of living.

To implement effective interaction between territorial communities and business, a progressive "win-win" management strategy, which was proposed by Harvard University scientists Roger Fisher and William Urie in 1981, can be used. It assumes that the struggle between the parties loses to mutually beneficial cooperation and the benefit is given by respect for the interests of the other party (Covey, 2020).

The impact of the activities of tourism enterprises on the development of territorial communities in the format of a "win-win" strategy is presented in Fig. 1.

In order to prove the decisive role of tourism development, the income indicators of local budgets and enterprises of the tourism and hospitality industries in 2018-2020 were analysed based on the data of the Ministry of Finance of Ukraine (2023) and the State Statistics Service of Ukraine (2023) (Table 1). Simultaneously, the main objects of the study were those regions that have a formed framework of specialisation of tourist destinations and a high level of tourist flows, such as Ivano-Frankivsk region – sports, recreational and "green" tourism, Lviv region – excursion and nostalgic tourism, Odesa region – health, excursion and nostalgic tourism, and Kherson region – health and recreational tourism. To assess the general influence of the tourism industry indicators on the local and regional budgets, the pre-crisis (for the tourism industry) years of 2018-2019 and 2020, the second half of which was marked by the COVID-19 pandemic,
were included.

![Diagram](image)

**Figure 1.** Harmonisation of the interests of territorial communities and business as to the "win – win" strategy

**Table 1.** The main indicators of the activity of territorial communities and business in the field of tourism and hospitality

<table>
<thead>
<tr>
<th>Regions</th>
<th>Indicators</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Local budget revenue, UAH million</td>
<td>Tourist tax, UAH million</td>
<td>Tourist enterprise revenue, UAH million</td>
<td>Revenues of the hospitality industry, UAH million</td>
</tr>
<tr>
<td>Ivano-Frankivsk region</td>
<td>18829,7</td>
<td>3,7</td>
<td>453,41</td>
<td>436,12</td>
</tr>
<tr>
<td>Lviv region</td>
<td>34 840,30</td>
<td>13,4</td>
<td>511,59</td>
<td>2 932,57</td>
</tr>
<tr>
<td>Odesa region</td>
<td>32 280,10</td>
<td>11,6</td>
<td>202,19</td>
<td>2 169,94</td>
</tr>
<tr>
<td>Kherson region</td>
<td>13 451,10</td>
<td>2,7</td>
<td>53,91</td>
<td>427,66</td>
</tr>
<tr>
<td>Ivano-Frankivsk region</td>
<td>18 357,60</td>
<td>6,1</td>
<td>344,95</td>
<td>454,8</td>
</tr>
<tr>
<td>Lviv region</td>
<td>34 495,0</td>
<td>21,6</td>
<td>655,64</td>
<td>2 753,2</td>
</tr>
<tr>
<td>Odesa region</td>
<td>33 474,7</td>
<td>21,4</td>
<td>220,54</td>
<td>2 349,0</td>
</tr>
<tr>
<td>Kherson region</td>
<td>13 129,6</td>
<td>8,4</td>
<td>58,2</td>
<td>385,1</td>
</tr>
<tr>
<td>Ivano-Frankivsk region</td>
<td>13913,5</td>
<td>5,6</td>
<td>262,28</td>
<td>357,7</td>
</tr>
<tr>
<td>Lviv region</td>
<td>29 135,2</td>
<td>11,8</td>
<td>485,50</td>
<td>921,32</td>
</tr>
<tr>
<td>Odesa region</td>
<td>28 242,0</td>
<td>15,2</td>
<td>196,52</td>
<td>748,31</td>
</tr>
<tr>
<td>Kherson region</td>
<td>11 025,7</td>
<td>4,5</td>
<td>32,25</td>
<td>115,29</td>
</tr>
</tbody>
</table>

*Source:* compiled by the authors based on official data of the Ministry of Finance of Ukraine and the State Statistics Service of Ukraine

Fig. 2-4 represent the dynamics of the business and territorial community indicators covering the tourism...
and hospitality industry (he figures delimit the interests of the named parties).

General indicators that determine the interests of communities comprise income to local budgets and employment of the local population, supplemented by the tourist tax, which reflects the tourist flow increase – accordingly, local business entities receive additional development.

**Figure 2.** Harmonisation of interests of territorial communities and business entities due to the tourism industry development at implementing the "win-win" strategy, 2018

**Figure 3.** Harmonisation of interests of territorial communities and business entities due to the tourism industry development at implementing the "win-win" strategy, 2019

**Figure 4.** Harmonisation of interests of territorial communities and business entities due to the tourism industry development at implementing the "win-win" strategy, 2020
The conducted analysis proves that the tourism industry can significantly add to local territories development, even those that have, in addition to tourism, other potential drivers of expansion (manufacture, transport, agriculture etc.).

Important issues in tourism restoration and development in the most damaged territorial communities and regions of Ukraine are the interaction between tourism companies and local authorities at all levels and support from international organisations for the coordination of actions. In this case, the application of a system of relevant interrelationships between individual tourism enterprises will contribute to the strengthening of their cooperation and will ensure a synergistic effect (Andries et al., 2021).

As world practice shows, the recovery of countries after crises occurs at the expense of profitable and fast-growing industries, one of which is tourism. (Jarmusevica et al., 2019). 2022 demonstrated a significant recovery in tourism spending, with revenues for many tourist destinations return to pre-pandemic levels (Baloch et al., 2022). In 2022, more than 900 million tourists made international trips. This is twice as much as in 2021, yet 37% less than in 2019. Europe continues to be the most attractive tourist region in the world with 585 million arrivals in 2022 (80% of the pre-Covid-19 pandemic level). According to the UNWTO forecast for 2023, the number of international tourists will reach 80-95% of the pre-pandemic level, especially in the regions of Europe and the Middle East (UNWTO, 2023).

The crisis was initially caused by the coronavirus pandemic and then continued because of Russia's military aggression. According to estimates by the World Bank and the European Commission, Russia's full-scale invasion in Ukraine resulted in the death of 9 655 civilians, including children (UN: there are more than 8 million internally displaced people in Ukraine. This is a quarter more than two months ago, 2023). The war caused significant losses of jobs, income and property for Ukrainian citizens. During the war, 13.5 million people were displaced in Ukraine and Europe. (During the year of the war, more than 9 600 civilians died in Ukraine, including 461 children, 2023). The economic situation in the country has deteriorated significantly. According to the Ministry of Finance of Ukraine, the real GDP declined by 11.4% in 2022 compared to 2021 (Minfin, 2023). Over the past two years, the nominal wage has decreased by 12%, and the real wage (corrected by inflation) dropped by 27% (Real wage, 2022). The unemployment rate in 2022 made 21.1%, compared to 10.3% in 2021. Employment deterioration was observed in all regions of Ukraine and was directly dependent on the full-scale invasion (Unemployment rate, 2023). Given that the damage caused to Ukraine's infrastructure is increasing every day, the cost of recovery after the one-year period of the Russian invasion alone was USD 411 billion (Zbytky, 2023). The frontline regions of Ukraine were most affected: Donetsk, Kharkiv, Luhansk, Zaporizhzhia, and Kherson (Table 2).

In addition, the reconstruction budget claims for Kyiv, Zhytomyr, Sumy, Chernihiv regions, where the Ukrainian authorities have regained control, amount to USD 56.4 billion, and USD 15.9 billion is needed to support Vinnytsia, Dnipropetrovsk, Kirovohrad, Odesa, and Poltava regions. The claim of the supporting regions (Volyn, Zakarpattia, Ivano-Frankivsk, Lviv, Ternopil, Khmelnitskyi, Chernivtsi, Cherkasy) amount to USD 11.4 billion.
The Ministry of Culture and Information Policy constantly records damage to cultural heritage sites in Ukraine as a result of Russian aggression. Starting from February 24, 2022, to July 25, 2023, 763 objects of cultural heritage were damaged or destroyed, including 105 of national significance, 595 of local significance, and 63 newly discovered among them (Table 3).

Table 3. Destruction of the tourist infrastructure of Ukraine

<table>
<thead>
<tr>
<th>Region</th>
<th>Length of destroyed roads, km</th>
<th>Damaged or destroyed monuments of cultural heritage, units</th>
<th>Region</th>
<th>Length of destroyed roads, km</th>
<th>Damaged or destroyed monuments of cultural heritage, units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>total</td>
<td>of national significance</td>
<td></td>
<td>total</td>
<td>of national significance</td>
</tr>
<tr>
<td>1. Vinnytsia</td>
<td>-</td>
<td>4</td>
<td>14. Odessa</td>
<td>0.2</td>
<td>69</td>
</tr>
<tr>
<td>2. Volyn</td>
<td>-</td>
<td>-</td>
<td>15. Poltava</td>
<td>63.0</td>
<td>-</td>
</tr>
<tr>
<td>3. Dnipro</td>
<td>75.0</td>
<td>28</td>
<td>16. Rivne</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4. Donetsk</td>
<td>2695.2</td>
<td>100</td>
<td>17. Sumy</td>
<td>1584.6</td>
<td>25</td>
</tr>
<tr>
<td>5. Zhytomyr</td>
<td>49.3</td>
<td>2</td>
<td>18. Ternopil</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7. Zaporizhzhia</td>
<td>3872.3</td>
<td>35</td>
<td>20. Kherson</td>
<td>3941.0</td>
<td>76</td>
</tr>
<tr>
<td>8. Ivano-Frankivsk</td>
<td>-</td>
<td>-</td>
<td>21. Khmelnytskyi</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>9. Kyiv</td>
<td>1402.3</td>
<td>69</td>
<td>22. Cherkasy</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10. Kropynnytskyi</td>
<td>-</td>
<td>-</td>
<td>23. Chernivtsi</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>11. Luhansk</td>
<td>2959.4</td>
<td>25</td>
<td>24. Chernihiv</td>
<td>1512.0</td>
<td>63</td>
</tr>
<tr>
<td>12. Lviv</td>
<td>-</td>
<td>32</td>
<td>25. Autonomous Republic of Crimea and the city of Sevastopol</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>13. Mykolaiv</td>
<td>1809.4</td>
<td>22</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: compiled by the authors based on the Recovery Plan of Ukraine, 2023 and the Government Portal (2023)

In connection with the full-scale invasion of the Russian Federation into Ukraine, the Resolution No. 1364 of the Cabinet of Ministers of Ukraine of December 6, 2022, (as amended) defined the list of territories where hostilities are (were) conducted or temporarily occupied by the Russian Federation (2022). The list includes territories in accordance with the Codifier of administrative-territorial units and territories of territorial communities. According to the Order of the Ministry on Reintegration of the Temporarily Occupied Territories of Ukraine No. 309 dated 22.12.2022 (as amended) and the results of monitoring, the territories of territorial communities should be grouped as following (Fig. 5):

I. Territories where hostilities are (were) conducted (territories of possible hostilities; active hostilities).

II. Temporarily occupied territories.

III. Territories where hostilities or temporary occupation have ended.

IV. Territories where no active hostilities were conducted, and which were not temporarily occupied.

Source: World bank (2023)
Figure 5. Map of Ukraine with designation of territories where hostilities took place

As to the end of July 2023, hostilities are (were) being conducted on 39.3% of territories of territorial communities which are now temporarily occupied, or hostilities or occupation had ended (Table 4). (Decision of the CM (as amended), 2023). The fourth group includes 12 'oblasts' (regions) of Ukraine, where hostilities were not conducted and which were not temporarily occupied.

In 2022, the tourism industry revenues to the state budget of Ukraine significantly decreased, namely: the share of tax paid by camping sites and children's recreation camps decreased by 57%, by tour operators - by 35%, and travel agencies - by 27%. The total number of taxpayers engaged in tourist activities decreased by 17%. A significant reduction in tax revenues was recorded in the city of Kyiv (58%) and Odesa (46%) region (SATD, 2023). Tourism taxes are small fees that are usually collected indirectly through accommodations or travel companies. Taxpayers are citizens of Ukraine, foreigners, and stateless persons who live within the territory of a city or village and occupy the accommodation temporarily. Tourist tax rates for domestic tourism in 2023 are up to 0.5% of the minimum wage and up to 5% for inbound tourism. The minimum wage as of
January 1, 2023 is UAH 6 700 (SATD (2023)).

<table>
<thead>
<tr>
<th>Region / city</th>
<th>Income from tourist tax, UAH million</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lviv region</td>
<td>41.43</td>
<td>23.15</td>
</tr>
<tr>
<td>Kyiv (the city of)</td>
<td>31.474</td>
<td>17.59</td>
</tr>
<tr>
<td>Zakarpattia</td>
<td>19.471</td>
<td>10.88</td>
</tr>
<tr>
<td>Ivano-Frankivsk</td>
<td>17.956</td>
<td>10.03</td>
</tr>
<tr>
<td>Cherkasy</td>
<td>12.555</td>
<td>7.02</td>
</tr>
<tr>
<td>Ukraine total</td>
<td>178.948</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: SATD (2023)

The number of foreign tourists to Ukraine decreased by approximately half – from 4 million to 2 million in 2022 compared to 2021. At the same time, the tourists were officials, delegations, representatives of international organisations, volunteers, and journalists. According to Euromonitor International, global inbound tourism lost $6.9 billion in 2022 due to the war in Ukraine (Ukraine Recovery Plan, 2022).

Covering all damages and needs will depend on the capabilities of the Ukrainian budget, private sector investments and the war trajectory. Tourism can become a source of income and a tool for the recovery of Ukraine precisely by ensuring the competitiveness of the tourist product as one of the sources of revenue formation for the budgets of united territorial communities, which will slow down internal and external labour
migration (Kabat et al., 2020), contribute to the growth of the population’s employment level, the development of transport, social and economic infrastructure (sectors with the greatest need for recovery: transport - 22%, housing and communal services - 17%, energy - 11%, social protection and livelihoods - 10%, explosives management - 9%, agriculture - 7%).

The process of decentralisation, which included the transfer of powers and budget revenues from state bodies to local self-government administrations through the formation of territorial communities (Klus & Martinkovich, 2019), contributed to the independent resolution of issues of local importance at the expense of own resources. The availability of tourist and recreational resources, a well-thought-out strategy for the development of the territorial community is a prerequisite for its restoration.

The restoration of territorial communities in Ukraine should consider a special approach to different groups of territories and be based on the principles of: immediate start and gradual development; creation of fair welfare; integration into the EU; reconstruction ‘better than it was’; stimulation of private investments. The formation of the system of proper livelihood of the population (Filip et al, 2022) of territorial communities in Ukraine should be based on the goals of sustainable development. Global trends prove that the guidelines on sustainable tourism development and management practices in the EU are applicable to all forms of tourism in all types of destinations, including mass tourism and various niche tourism segments. The principles of sustainability of the EU regarding the environmental, economic, and socio-cultural aspects of tourism development acquire the proper balance between these three dimensions in order to guarantee the long-term sustainability of tourism development in Ukraine.

The current experience notices of the impossibility to implement all the above-mentioned directions of tourism development, unless an effective system for ensuring the safety of tourists, providing high-quality and affordable services is created in the country, issues related to the ecological safety of the territories, preservation of cultural heritage in compliance with standards for quality shelter, changes in the approach to urban planning and evacuation plans for people and valuables. The implementation of the above-mentioned directions requires the involvement of various sources of funding, among which is the tourist tax, which feeds the local budget. Theoretically, the income generated by this tax can be directed by local authorities to the improvement and development of the tourist infrastructure of territorial communities and other goals of local economic development. This will have a positive impact on the economic security of communities (Voznyak et al., 2021).

The upheavals caused by war bring great changes and a new legacy is created as a result. Many people are proud of Mariupol, Chernihiv, Kharkiv, Bucha, Gostomel, Irpin, Borodyanka and many other cities and communities. Foreigners and Ukrainians will want to visit the places where our people heroically won in the fight against the enemy, choosing freedom. Therefore, the development of memorial tourism with the involvement of state institutions, business, and cultural initiatives will eventually be mixed with other types of tourism: cultural, sports, green, etc. (Revitalization of tourism 2022).

To ensure tourism development and a positive impact on the recovery of territorial communities in Ukraine
in the post-war period, it is necessary to apply sustainable tourism practices and create tourism products that incorporate the cultural and natural heritage of the region (UNDP, 2023); promote the wide impact of tourism on the territory and population through the involvement of economists, sociologists, anthropologists, ecologists and other specialists who can help in this work (Costa et al., 2020).

Cooperation with local communities and giving them the opportunity to participate in solving development issues and tourism management is important in the process of restoring the tourism sphere. The support of small and medium-sized businesses at the local level through the provision of economic sustainability and social justice in the tourism sector will ensure the creation and development of jobs, which is extremely relevant for the current situation (Nosyriev et al., 2022).

Ensuring the effective functioning of the tourism industry requires a system of management, regulation and control by territorial communities linked to the interests of local residents and ensuring their participation in the process of tourism development. Civil society can play an important role in the recovery of a tourist destination – in particular, by entering into the process of planning and implementing projects, ensuring monitoring of their implementation and influencing the regulation of tourism industry activities within the territory of the community.

An essential step in the restoration of the national economy is the development of proposals and solutions aimed at domestic tourism development (Fig. 6).

To draw attention to Ukraine, open new tourist markets and ensure the attraction of foreign investments in the tourism industry, it is necessary to create an effective network of informing the world community about Ukrainian history and culture, including through an all-Ukrainian tourist portal, digitalisation of tourist infrastructure facilities, development of virtual tours considering Ukrainian post-war realities. These approaches can be used, for example, when introducing new formats of memorial tourism.

The possibilities of digitalization in the development of a tourist destination as a sustainable ecosystem have been proven in research (Petya Popova, et al. 2023). Cooperation between local tourism destination management establishments and tourism businesses is a key solution to support digitalisation. In addition, the main tasks of digitalisation in tourism are training in new digital technologies and the development of high-speed broadband. Virtual reality is one of the popular technologies in the global tourism industry development. The unforeseen socio-economic challenges provoked by the war in Ukraine can make the development of VR and AR technologies one of the important tools for tourism recovery (Market revenue, 2023). The achievement of a positive balance of key economic indicators is also crucial for the recovery of territorial communities in the post-war period.

It should also be noted that the development of local infrastructure is pre-designed and tested primarily by local residents, who use the logistics system, recreational services and communications more than visiting tourists. The trend towards strengthening individual tourism, which is becoming increasingly popular in different countries (especially with already saturated markets), requires a precisely developed local transport and information infrastructure, convenient for use and mastered by the local population, to facilitate route
planning and stay in the destination for foreigners. Thus, a region with modern technologies of “smart cities” (many innovations can be implemented not only in metropolises, but also in settlements with a small number of residents) wins twice: the first time, getting paid for the implemented technologies by residents who use them in day life, and simultaneously act as testers, and the second - upon arrival of tourists, both domestic and foreign flows.

**Figure 6.** Challenges and directions of restoration of the tourist sphere of territorial communities

One of the approaches to post-war recovery is the formation of strategic focus areas of tourist specialisation in accordance with the tourist potential of destinations and the goals of territorial development. To ensure an effective result, it is necessary to highlight and consider those negative changes that took place in the respective
territories during the war in terms of security, including environmental, population demography, labour potential and economic status of the community. To restore territories as tourist destinations, it is necessary to apply appropriate regulatory activities regarding the preparation of laws and by-laws (Kuril, 2020). First, they should be aimed at maximally motivating the return of young people, ensuring the appropriate level of their social development.

The situation in the country is extremely difficult, but the gradual liberation of a part of the occupied territories contributes to the recovery of the national economy. Thus, the National Bank of Ukraine made a forecast of key economic indicators until 2025 based on real data of 2019-2022 (Report on inflation and monetary policy of the National Bank of Ukraine for the first quarter of 2023, 2023). Based on the NBU forecast, we used the MATLAB software to create a three-dimensional graph describing the changes in some key economic indicators over a period of seven years, from 2019 to 2025. This approach designs a visual interpretation and conduct a detailed analysis of data (Fig. 7).

![Changes in Indicators over Time](image)

**Figure 7.** Forecast of economic indicators until 2025

*Source: compiled by the authors on the basis of the Report on inflation and monetary policy of the National Bank of Ukraine for the first quarter of 2023, 2023*

Where:
- Real GDP reflects changes in the volume of the gross domestic product, corrected by inflation.
- Base inflation reflects the expected inflation rate without the influence of one-time factors.
- Consumer Price Index (CPI Index) reflects changes in prices for goods and services in the country.
- Nominal wage reflects the expected changes in the average salary level.
- Real wage reflects the expected changes in the average wages, corrected by inflation.
- Unemployment rate reflects the expected labour market conditions in the country.

In recent years, significant changes have been observed in Ukraine, which are related to internal and external economic factors. At the same time, an increase in the 2023 consumer price index and core inflation compared to the previous year is predicted, with a decrease in the unemployment rate, an increase in real GDP, real and nominal wage (Fig. 8).
Figure 8. Dynamics of key economic indicators for 2018-2026

The data of Fig. 8. indicate a recessionary period of the Ukrainian economy in 2022 and further growth of real GDP in 2024 and 2025, a gradual decrease in the inflation rate and the unemployment rate (in 2023 – to 18.3%, in 2024 – to 16.5%, in 2025 year - up to 14.7%). In 2023-2025, the labour market recovery is expected resulting from economic growth.

This predicted trend is the key to the country's overcoming of the economic crisis.

First, the GDP growth, which can raise the income of the state and regions and subsequently be directed to the development of infrastructure, education, health care and other areas. This is important for territorial communities, which will become more attractive for investors and businesses, thus ensuring the employment of the local population and their welfare.

Second, lower inflation rates in the coming years may contribute to reducing the current negative impact. In the context of the territorial community's recovery, information on nominal and real wages can help to assess the effectiveness of its progress. The growth of real wages in territorial communities may highlight that the local economy is recovering after the crisis. However, if the nominal wage increases faster than inflation, this can have a negative effect on the economy as a whole and lead to an increase in inflation and a decrease in the purchasing power of citizens. Therefore, when restoring territorial communities, it is important to balance the growth of nominal wages with inflation to ensure stable economic development.

Thirdly, a gradual decrease in the level of unemployment will stimulate economic activity and the recovery of territorial communities.

The restoration of territorial communities in Ukraine in the post-war period should be based on the implementation of strategic principles of sustainable tourism development for maintaining national interests
and solve the following tasks:

- creation of a peaceful, open and safe, socially cohesive society with proper governance and inclusive institutions;
- overcoming imbalances in the economic, social and environmental spheres;
- decentralisation and implementation of regional policy, which ensures a harmonious combination of national and regional interests;
- transformation of the economic activity of territorial communities and tourism business on the transition to the principles of the "win-win" strategy;

- ensuring partnership interaction of state authorities, local self-governments, business, science, education and civil society organisations for the relocation of young people and their future social activity;
- revitalisation and development of territories as tourist destinations, maintaining the environment in proper condition, which will ensure the quality of life of the local population and tourists;
- preservation and development of national cultural values and traditions.

The restoration and sustainable development of tourism should create the grounds for the development of territorial communities in Ukraine based on the effective use of scientific achievements, the stimulation of innovative activities, finally, the creation of a favourable investment climate.

DISCUSSION

To substantiate the theoretical and methodological provisions and practical recommendations regarding the development of sustainable tourism and its impact on the territorial communities' recovery in the post-war period, we suggest summarising the available achievements regarding certain aspects of the research, which are grouped into:

- defining the problems of globalisation and the transition to sustainable development, compliance with its principles by subjects of certain types of economic activity (Transforming our world: the 2030, 2015);
- implementation of the sustainable development goals in the field of tourism with the determination of the main priorities for tourist destinations in Ukraine concerning national backgrounds (Babov et al., 2019);
- factors that affect recreational and tourist resources and tourism in general without observing the principles of sustainable development (Bazhenova et al., 2022; Roik et al., 2022), systematisation of probable changes expected in the tourism industry in the coming years according to world data online platforms and news agencies without taking into account the restorative nature of the impact of sustainable development on the country's economy (Nosyriev et al., 2022; Motsa et al., 2022);
- a comprehensive consideration of the investment attractiveness of regional tourism systems of Ukraine, which is based on financial aspects and the resource potential of the subjects of tourism activity (Boiko et al., 2018, 2022; Bosovska et al., 2019);
- development of tourism in the community, considering available and engaged labour, natural, recreational, historical-cultural, balneological and other resources (Filip et al., 2023), development of strategies...
for promoting the tourist potential of territorial communities on domestic and foreign markets (Koval, 2019).

Studying theoretical, methodological and praxeological aspects of sustainable development of tourism and its impact on the national economy are the focus of research by experts of the World Economic Forum (WEF, 2023), and the World Tourism Organization (UMWTO, 2023). Sharpley R. (2020) substantiated the theoretical interrelation between tourism and sustainable development. Such scientists as L. Ruhanen etc. (2015) studied the trends and patterns of tourism development based on the principles of sustainability over the past 25 years. D. Miller, B. Merrilees, A. Coughlan (2014) link urban development to sustainable tourism. Hussain et al. (2015) investigated the relative impact of aspects of sustainability (ecological, economic, socio-cultural, and institutional) on anticipating satisfaction with the development of sustainable tourism. The obtained results demonstrate that the present scientific literature does not contain approaches to determining the impact of sustainable tourism on the recovery of territorial communities in Ukraine in the post-war period.

Many scientists determine the theoretical and practical foundations of tourism development without estimation of potential factors of evolutionary changes, principles of sustainable development and forecasting its impact on the progress of territories. Only a few Ukrainian and foreign scientists concluded that the irrational use of resources, the degradation of natural and cultural heritage, as well as negative social consequences determine the need to change the paradigm of tourism development based on rational management and responsible use of recreational and tourist resources in compliance with principles of sustainable development (Ugur et al., 2020; Zenker et al., 2020; Hall, 2019; Mihalic, 2020; Kock et al., 2020; Sigala, 2020).

The development of national economic systems within the Industry 4.0 concept involves the further implementation of artificial intelligence in the management of territorial communities, the use of large databases, cloud and Internet of Things technologies (Dalenogare et al., 2018; Matyushenko et al., 2020).

Modern approaches to the institutional environment development should be used both at the state and local self-government level, to progress sustainable development of humanity towards political and institutional coherence while supporting any sphere including tourism (Transforming our world: the 2030, Agenda for Sustainable Development (2015), point 17.17). Changes in the state administration system aimed at expanding the socially responsible model of society's evolution and harmonising the interests of the entire business environment, necessitate the use of cognitive approaches as the most promising directions for reforming modern management systems (Labunska, et al, 2019).

When investigating the concepts of implementation of "smart infrastructure" and "smart city", Yermachenko et al. (2023) emphasize the existing challenges to the effective management at the community level. These challenges are provoked by the emergence of a gap between the stated goals of management and the needs and motives of citizens' behaviour. In this aspect, the harmonisation of the goals of the country's socio-economic development and the interests of civil society at the level of individual territories acquires great significance and is defined as one of the priority goals specified in the UN Resolution (Transforming our world: the 2030 Agenda for Sustainable Development, 2015). The indicated problem needs to be solved at
both levels – of new methodological approaches and of designing practical recommendations for the development of territorial communities.

The implementation of digital technologies, support for the digital transformation of tourism service providers will contribute to the innovative practices of booking and consumption of tourist services, as well as to fostering inclusive tourism. The dependence between the tourism industry and the development of human capital in the modern conditions of economy digitalisation is determined (Stryzhacket al., 2021).

The authors identified the main directions of tourism development based on sustainability by grouping territorial communities on grounds of their location during hostilities, compared to the already existing scientific research aimed at improving the vectors of strategic development of the tourism industry in the conditions of armed conflicts and post-conflict recovery (Nosyriev et al., 2022), optimisation of possible measures to coordinate the activities of the main participants of the tourism industry with substantiation of further post-war recovery trends (Bazhenova et al., 2022), the systematisation of the negative consequences of armed conflicts on tourism, the identification of the main obstacles to the development of inbound tourism in modern realities (Taranenko, 2022).

Opposing to the existing works of Ukrainian scientists (Roik et al., 2022; Koval, 2019), in which attention is focused on the justification of the tourism sphere development as an object and subject of the political process that affects the change of the institutional structure, we have broadened the idea possible coordination of the life of tourist communities with global standards of safety and quality of tourist services in accordance with the criteria of sustainable development.

The analysis of inbound tourist flows over the past 20 years (Roskladka et al., 2018) made it possible to identify the factors that caused the negative dynamics of tourist arrivals in Ukraine and to build a forecasting model of this component using various types of spline interpolation and predictive functions. The results of the conducted comparative analysis in different systems gives confidence in the development of inbound tourism, especially in the post-war period.

The aggression of the Russian Federation against Ukraine caused crisis phenomena in all sectors of the country’s economy, including the tourism and hospitality industry. Not only the general indicators of profitability of all business entities of the tourism industry were affected, but also the disruption of structural relationships between business units of the tourist services market occurred. Studying the current state of the tourist services market and the hospitality industry, Zuravka et al. (2023) point to problems that lead to a decrease in the hospitality sector efficiency. This is the destruction of the formed chains of interaction between the subjects of tourism activity, a decrease in solvent demand, a shortage of certain types of products, a lack of personnel. Agreeing with the identified problems, one should add systemic problems of interfering the harmony between territorial communities and the activities of subjects in the field of hospitality and tourism. These reflect the reduction of cash flows to local budgets, the impoverishment of the population due to the loss of jobs, the destruction of infrastructure facilities, damage to ecosystems and tourist attractions. Such circumstances inhibit sustainable development at the local level, tourism and hospitality in particular, and the
country's economy as a whole.

The main hypothesis of the study is to prove the influence of the tourism industry on the general development of local communities, in which a framework of tourist destination specialisation has been formed, and to determine tourism as a stimulus of sustainable development of territories.

The application of the "win-win" concept to harmonise the interests of local communities and businesses allows to form a conceptual direction of approaches to the development of tourist destinations in the post-war reconstruction of the country.

The research methodology is based on the provisions of macroeconomic theories, concepts of sustainable development, scientific assumptions that effectively organised and methodologically ensured development of domestic and inbound tourism, world popularisation of tourism potential of Ukraine, reconstruction of tourist infrastructure, institutional support of tourism entities can contribute to restoration of territorial communities in the post-war period, including through the development of sustainable tourism.

CONCLUSIONS

The invasion of Russia provoked significant challenges for territorial communities. At the local level, it is necessary to solve humanitarian, communal, resources supply, technical, and migration problems, as well as to restore the destroyed infrastructure and logistics. Territorial communities need to continue financing social and economic development in the face of reduced revenues to local budgets. Involvement of local residents in decision-making processes related to the infrastructure development of the territorial communities on the basis of civil initiatives may stimulate the civil society engagement.

Civil society can play an important role in mobilising resources and creating a more sustainable and enabling environment for sustainable tourism development. Therefore, territorial communities need to support tourism as a source of internal financing and expanding external source of the local budget. Sustainable tourism can be a tool for the territorial communities recovery after the war, and the revitalisation of tourist destinations must consider the interests of local residents and involve civil society in the process of tourism development.

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Conceptualization, V. Ye. and S. M.; methodology, V. Ye. and S. M.; software, T. D.; validation, M. S. and T. L.; formal analysis, T. D.; investigation, T. L.; resources, T. D.; data curation, T. L.; writing—original draft preparation, V. Ye. and S. M.; writing—review and editing, M. S. and S. M.; supervision, V. Ye.; project administration, S. M.; funding acquisition, V. Ye and M. S.

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During the year of the war, more than 9,600 civilians died in Ukraine, including 461 children. (2023).


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UN: there are more than 8 million internally displaced people in Ukraine. This is a quarter more than two months ago. (2023). available at: https://susipilne.media/237912-v-ukrainsi-ponad-8-miljoniv-vnutrisno-peremisenih-lyudej-oon/ (accessed on 25 May 2023)


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CORRUPTION PERCEPTION TRENDS: EUROPEAN UNION COUNTRIES

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ABSTRACT

The study analyzes the perception of the level of corruption in the countries of the European Union. We decided to summarize and explore the results of the Corruption Perceptions Index (CPI) for the period from 2012 to 2022 in all EU countries - Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden. We then compared the 2012 results with the 2022 results for each EU country and identified the three countries with the best percentage performance. Our study identified three countries in the European Union, that saw the most rapid improvement in the CPI score from 2012 to 2022: Greece (+44%), Italy (+33%) and Latvia (+20%). These achievements are interesting and significant in two contexts. Firstly, the overall rating of the EU has increased by only 2% during this period. Secondly, our established in-depth study group (Greece, Italy and Latvia) demonstrated not only a significant percentage increase, but also the persistence of a positive trend. We can identify 3 trend leaders - Greece, Italy and Latvia - both in terms of percentage growth from 2012 to 2022, and in the proportion of years where there were noticeable improvement trends. It is significant that this dynamic was not affected by the overall trend in the EU.

Keywords: corruption, European Union, Corruption Perceptions Index

JEL classification: D73; J18; K42

Paper type: Case Study


INTRODUCTION

The problem of corruption is relevant all over the world (Yessengeldin et al., 2019; Nenkov et al., 2016)). According to Global Corruption Barometer European Union 2021 - people from the 27 countries surveyed in this Global Corruption Barometer - European Union are well aware of these issues and want their leaders to act with more integrity. An overwhelming majority see corruption as either stagnating or being on the rise in their country, and there is a widespread belief that governments are tackling it poorly. Many also encounter corruption directly, either through paying bribes or, more commonly, using personal connections to access essential services, such as health care and education. A large majority of people know that they can make a difference in the movement against corruption. If they are supported by their governments and by EU
bodies, which can now cut funding to countries breaching rule of law, the region could really earn its clean reputation (GCB 2021).

At the end of 2022, suspicions of corruption have also affected the European Parliament. Namely, Belgian police arrested a vice president of the institution and carried out multiple searches at the parliament, and in private residences. At least six individuals have been arrested by Belgian police following a "major investigation" into corruption, money laundering and criminal organisation. One of the individuals was one of 14 vice presidents of the European Parliament (Euronews 2022). Although the European Union has a fairly good record of corruption perceptions, not all EU countries are at the same level. In addition, in different EU states, there are multidirectional trends, multidirectional dynamics of perception of corruption.

The purpose of this article is to summarize the performance of the CPI in all EU countries in the period from 2012 to 2022. Then select the countries that showed the best dynamics in this time interval. At the end of the article, conclusions are drawn. In this article, we continue our previous efforts in the study of corruption (Krivins 2014; Vilks 2017; Krivins 2018; Krivins 2019; Vilks and Kipane 2022).

The methods: comparative and systematic literature and surveys review.

LITERATURE REVIEW

The problem of corruption is traditionally an actively discussed problem. The studies are applicable both to the EU as a whole and to individual European countries and regions, for example: "Institucional and legal basis of counteracting corruption: experience of the European Union and Ukraine" - which allowed to distinguish three groups among the countries of the European Union: 1) highly developed countries, which have a high quality of life and low levels of corruption; 2) highly developed countries which provide high quality of life, but corruption is high enough; 3) countries with a high level of corruption and a relatively low level of quality of life (Blikhar et al. 2022); "Romania’s Justice and Anti-Corruption Reform: A Stubborn Divergence from European Norms in Pursuit of Personal Gains" - the priority attached by the EU to the rule of law and justice reform can hardly eliminate the fundamental incentive for political corruption. A self-serving political elite remains unable to genuinely commit to the implementation of substantial anti-corruption reforms (Martin-Russu et al. 2022); "The phenomenon of corruption in Albania: towards cigarette smuggling" (Raistenskis et al. 2023); "The European Union's Anti-corruption Policy Advice in Ukraine Between Grand Visions and (Geo)political Realities" (Richter 2023); "Conditions for application of criminal liability to the board of a company in the legal system of the Republic of Latvia" (Teivans-Treinovskis et al. 2022).

The research "Competitiveness, fiscal policy and corruption: evidence from Central and Eastern European countries" shows how a growth in public spending affects the competitiveness of CEE economies through the real exchange rate. It takes into account the phenomenon of corruption applied to Eastern countries, emphasizing a decrease in the external competitiveness of these economies in response to the manifestation of corruption (Tiganasu et al. 2022); the paper "Institutional quality, corruption, and
impartiality: the role of process and outcome for citizen trust in public administration in 173 European regions" fits a multilevel model on a unique dataset (N= 129,773) with observations nested in 173 European regions, using data from a series of pooled Eurobarometer surveys and from the European Quality of Government Index (Van de Walle and Migchelbrink 2022).

A sufficiently large range of current research is related to the economic dimension – "The impact of corruption on investment and financing in the European Union: new insights" (Farinha and López-de-Foronda 2023), "Links between crime and economic development: EU classification" (Remeikiene et al. 2022), "Corruption, national culture and corporate investment: European evidence" (García-Gómez et al. 2022).

However, in addition to the usual research - related to the prevention and combating of corruption - "International implications of corruption in Eastern European prosecution offices: a field report" (Teichmann and Wittmann 2023); anti-corruption legal framework: "Practice of the member states of the European Union in the field of anti-corruption regulation" (Melynyk et al. 2022) un pretkorupcijas stratēģijām: "Fraud Prevention, Political Corruption, and Anti-Corruption Strategies: The European Anti-Fraud Office" (Saiz-Alvarez 2023), - in 2022 and 2023, new directions of research have also emerged, for example, the impact of sanctions on the level of corruption: "Global sanctions against corruption and asset recovery: a European approach" - this paper argues in favour of a dedicated global sanctions regime against corruption, which is necessary to mitigate significant risks for the EU internal market (Pavlidis 2023); gender issues: "Unpacking the link between gender and injunctive norms on corruption using survey data: A multilevel analysis of 30 European countries" (Dotti Sani and Guglielmi 2022); the role of the political elite: "Introduction: The European Paradox of Expecting Corrupt Political Elites to Lead the Fight Against Corruption" (Martin-Russu 2022); impact of the Covid pandemic:"Accelerating Digital Transformation Implementation in the Fight Against Corruption? Evidence From European Countries Before and During the COVID-19 Pandemic" (Thanh 2022) and even the energy problem: "Energy security of the European Union and corruption in Central Asia as the main challenges for the European sustainable energy future" (Vasić et al. 2023).

Analyzing more current research directions, we have focused on the European Union as a whole, comparing the results of all EU member states in changes in the level of perception of corruption within 10 years.

METHODOLOGY

We decided to summarize and explore the results of the Corruption Perceptions Index (CPI) for the period from 2012 to 2022 in all EU countries - Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden. We then compared the 2012 results with the 2022 results for each EU country and identified the three countries with the best percentage performance.
We generalized indicators for each country-year indicating whether the dynamics of the results of each country in each analyzed year positive, negative or neutral. Positive results (improvement in the indicators of the Corruption Perceptions Index for the previous year) we marked with the sign "+". Negative results (deterioration of the indicators of the Corruption Perceptions Index for the previous year) we marked with the sign "-". Neutral results (no changes in the indicators of the Corruption Perception Index for the previous year) we marked with the sign "=". Thus, three dimensions of analysis were outlined. The results are tested using panel data on a global sample of 27 countries covering 2012–2022. The sample consists of 297 country years.

RESULTS AND DISCUSSION

Changes in the perception of corruption from 2012 to 2022

Clearly aware of the advantages and disadvantages of the CPI index methodology, we nevertheless recognize that today the CPI is the most important tool for cross-country comparison not only in the European Union, but also on a global scale. In Table 1, we have summarized the CPI data (Transparency International, 2022), indicating the results of all countries that are currently part of the European Union for the period from 2012 to 2022. Also, we have made a calculation regarding the changes in the result of each individual country, comparing the result of 2012 with the result of 2022 (we have presented these results in rows L-1 to L-27 of the table 1). Later, we have calculated the total score of all these countries for each year separately (we have presented these results in columns A-28 to L-28 of the table 1). Finally, we have calculated the average of all these countries for each year separately - we have presented these results in columns A-29 to L-29 of the table 1.

Table 1. Compilation of CPI index data in 27 member states of the European Union

<table>
<thead>
<tr>
<th>№</th>
<th>CPI</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>2012 vs 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Austria</td>
<td>71</td>
<td>74</td>
<td>76</td>
<td>77</td>
<td>76</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>72</td>
<td>69</td>
<td>69</td>
<td>1.03</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Belgium</td>
<td>73</td>
<td>73</td>
<td>76</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>77</td>
<td>77</td>
<td>76</td>
<td>75</td>
<td>75</td>
<td>0.97</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bulgaria</td>
<td>43</td>
<td>42</td>
<td>44</td>
<td>43</td>
<td>42</td>
<td>43</td>
<td>41</td>
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<td>41</td>
<td>41</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Croatia</td>
<td>50</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>48</td>
<td>49</td>
<td>49</td>
<td>51</td>
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<td>48</td>
<td>46</td>
<td>1.09</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Cyprus</td>
<td>52</td>
<td>53</td>
<td>57</td>
<td>58</td>
<td>59</td>
<td>57</td>
<td>55</td>
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<td>63</td>
<td>66</td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Czech Republic</td>
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<td>54</td>
<td>54</td>
<td>56</td>
<td>59</td>
<td>57</td>
<td>55</td>
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<td>48</td>
<td>49</td>
<td>1.14</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Denmark</td>
<td>90</td>
<td>88</td>
<td>88</td>
<td>87</td>
<td>88</td>
<td>88</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>91</td>
<td>90</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Estonia</td>
<td>74</td>
<td>74</td>
<td>75</td>
<td>74</td>
<td>73</td>
<td>71</td>
<td>70</td>
<td>70</td>
<td>69</td>
<td>68</td>
<td>64</td>
<td>1.16</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Finland</td>
<td>87</td>
<td>88</td>
<td>85</td>
<td>86</td>
<td>85</td>
<td>85</td>
<td>89</td>
<td>90</td>
<td>89</td>
<td>89</td>
<td>90</td>
<td>0.97</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>France</td>
<td>72</td>
<td>71</td>
<td>69</td>
<td>69</td>
<td>72</td>
<td>70</td>
<td>69</td>
<td>70</td>
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<td>1.01</td>
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<td>11</td>
<td>Germany</td>
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<td>78</td>
<td>79</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Greece</td>
<td>52</td>
<td>49</td>
<td>50</td>
<td>48</td>
<td>45</td>
<td>48</td>
<td>44</td>
<td>46</td>
<td>43</td>
<td>40</td>
<td>36</td>
<td>1.44</td>
<td></td>
</tr>
</tbody>
</table>
Our summary shows that EU results are good in the world context. In 2022, out of the total ranking of 180 countries in the world, 11 EU countries entered in the first 27 places in the world - including Denmark, Finland, Sweden, Netherlands, Germany, Luxembourg, Ireland, Estonia, Belgium, France, Austria. The EU average of 63.6 (see table 1, column A-29) is above the world average.

Turning to the task of our article, we have made calculations and found that among the member states of the European Union, Greece (+44%), Italy (+33%) and Latvia (+20%) have the largest increase in results. Even more so, this indicator can be evaluated positively considering the fact that the overall rating of the EU has increased by only 2% during this period (see column L-29 of the table).

However, this first table alone would not be enough, because it was necessary to conduct research also regarding the independence of the trend direction, or in other words, to make sure that these achieved high percentages are not a coincidence, not just a short-term "jump". Therefore, the results of all 27 EU countries were checked by determining the direction of the trend for each individual research year, namely by comparing the results of 2022 with the results of 2021, the results of 2021 with the results of 2020, etc. the resulting trend direction conclusion was labeled accordingly.

**Trends in the perception of corruption from 2012 to 2022**

In Table 2 we have summarized the CPI data, indicating the trends of all countries that are currently part of the European Union for the period from 2012 to 2022. Positive results (improvement in the indicators of the Corruption Perceptions Index for the previous year) in our table is marked with the sign "+". Negative results (deterioration of the indicators of the Corruption Perceptions Index for the previous year) in our table is
marked with the sign "-". Neutral results (no changes in the indicators of the Corruption Perceptions Index for the previous year) in our table is marked with the sign "+=".

Table 2. Trends in the perception of corruption in 27 member states of the European Union

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>=2+4-4</td>
<td>0</td>
</tr>
<tr>
<td>Belgium</td>
<td>=</td>
<td>-</td>
<td>+</td>
<td>=</td>
<td>-</td>
<td>=</td>
<td>+</td>
<td>+</td>
<td>=</td>
<td>=</td>
<td>=5+3-2</td>
<td>1</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>=</td>
<td>=2+5-3</td>
<td>2</td>
</tr>
<tr>
<td>Croatia</td>
<td>+</td>
<td>=</td>
<td>=</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>=</td>
<td>=</td>
<td>+</td>
<td>=4+3-3</td>
<td>0</td>
</tr>
<tr>
<td>Cyprus</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>=</td>
<td>=</td>
<td>=1+2-7</td>
<td>-5</td>
</tr>
<tr>
<td>Czech Republic</td>
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<td>+</td>
<td>+</td>
<td>-</td>
<td>=1+5-4</td>
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</tr>
<tr>
<td>Denmark</td>
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<td>=</td>
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<td>-</td>
<td>=</td>
<td>-</td>
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<td>+</td>
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<td>=</td>
<td>=2+4-4</td>
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</tr>
<tr>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>=</td>
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<td>+</td>
<td>=</td>
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The obtained data show that the most persistent improvement of CPI trends are in five EU countries: Italy, Greece, Latvia, Estonia and Lithuania. In this way, we have established that our previously established
in-depth study group (Greece, Italy and Latvia) demonstrated not only a significant percentage increase, but also the persistence of a positive trend. In both countries, we can identify 3 trend leaders - Greece, Italy and Latvia - both in terms of percentage growth from 2012 to 2022, and in the proportion of years where there were noticeable improvement trends. It is significant that this dynamic was not affected by the overall trend in the EU. For example, when the results of 2016 compared to the results of 2015 had worsened in 15 EU countries, the situation in Greece, Italy and Latvia, on the contrary, had improved.

CONCLUSIONS

Our study identified three countries in the European Union, that saw the most rapid improvement in the CPI score from 2012 to 2022: Greece (+44%), Italy (+33%) and Latvia (+20%). These achievements are interesting and significant in two contexts. Firstly, the overall rating of the EU has increased by only 2% during this period. Secondly, this group (Greece, Italy and Latvia) demonstrated not only a significant percentage increase, but also the persistence of a positive trend. We can identify 3 trend leaders - Greece, Italy and Latvia - both in terms of percentage growth from 2012 to 2022, and in the proportion of years where there were noticeable improvement trends. It is significant that this dynamic was not affected by the overall trend in the EU. For example, when the results of 2016 compared to the results of 2015 had worsened in 15 EU countries, the situation in Greece, Italy and Latvia, on the contrary, had improved.

Some patterns in the data present puzzles warranting further investigation. For example, using extended data led to our most intriguing discovery: in 2015 (compared with 2014) in the European Union there was a significant powerful improvement in the average CPI (which reached the level of 65 points). In subsequent years, the situation has returned to the previous level and the average level of 65 points has not yet been reached. Future research also should examine this phenomenon.

It is obvious that such relatively rapid positive results in Italy, Greece and Latvia have been possible, taking into account the small base effect. Naturally, significant percentage improvements are easier to achieve when the reference point is below the average. In countries such as Denmark, Finland, Sweden, Netherlands, Germany, Luxembourg, Ireland, Estonia, Belgium, France, Austria, where very good results have already been achieved, the growth potential is severely limited. However, on the other hand, not all EU countries where the reference point is below the EU average are improving. On the contrary, there are cases when there is a decline - for example, Cyprus in 2022 has obtained only 0.79 of the result of 2012 (Cyprus CPI 2022 = 52, Cyprus CPI 2012 = 52); Hungary in 2022 has obtained only 0.76 of the 2012 result (Hungary CPI 2022 = 42, Hungary CPI 2022 = 66) Malta in 2022 has obtained 0.89 of the 2012 result of 0.89 (Malta CPI 2022 = 51, Malta CPI 2022 = 57).

During these years, Latvia, Italy and Greece solved various problems - the problems were different, everyone had to focus on a particularly acute problem in this country. For example, Latvia's specific challenges are prevention of wastage of public resources, political integrity, business integrity and regulation.
of transparent interest representation (lobbying). It must be recognized that both Latvia and Greece lag behind the EU average in terms of political honesty. Italy also has specific problems.

In our future publications, we plan to study in depth the group of countries we have identified (Italy, Greece, Latvia) in order to establish the reasons for the improvement in the CPI index indicators.

It is also necessary to introspectively consider the main activities that these countries have carried out to achieve positive results of changes in the level of perception of corruption - based on the analysis of this successful experience, in our future publications we plan to summarize the most effective methods and formulate proposals for other EU countries.

Author Contributions:
All authors have contributed to the paper equally.
All authors have read and agreed to the published version of the manuscript.

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Conflict of interests
The authors declare no conflict of interest.

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Dotti Sani, G.M., Guglielmi, S. Unpacking the link between gender and injunctive norms on corruption using survey data: A multilevel analysis of 30 European countries (2022) Norms, Gender and Corruption: Understanding the Nexus, pp. 78-98


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HOW ADMINISTRATIVE AI APPLICATIONS ENHANCE ORGANIZATIONAL INNOVATION AND QUALITY OF WORK LIFE FOR DISABLED EMPLOYEES: A CASE STUDY OF A SAUDI UNIVERSITY

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ABSTRACT

Objectives: This study examines the impact of artificial intelligence (AI) administrative applications on the relationship between organizational innovation and quality of life for persons with disabilities. Methods/Approach: The researchers will use a descriptive-analytical approach to achieve this goal. The study population consists of employees at the Northern Border University in Saudi Arabia, and a random sample of workers who directly impact the topics covered by the study will be used. The questionnaire will be used as a tool to collect information. Results: The most important results of the study were the existence of a statistically significant correlation between the dimensions of AI and the relationship between organizational innovation and quality of life for persons with disabilities, with AI acting as a mediating variable. Conclusions: The most important recommendations were prioritizing organizational innovation for effective AI use in administration, providing training and support for organizations to integrate AI in administration, investing in AI technology for people with disabilities, developing guidelines and best practices for AI in administration, fostering collaboration between organizations, technology, and disability groups, and establish ethical policies for AI use in administration.

Keywords: Artificial intelligence, Organizational Innovation, Quality of work Life, Persons with disabilities.

JEL classification : O31, O33, M15

Paper type: Research article

INTRODUCTION

The use of Artificial Intelligence (AI) in administrative tasks has the potential to act as a mediator between organizational innovation and the quality of life for individuals with disabilities (Sikdar, 2018). By enhancing efficiency and decision-making within an organization, AI can facilitate the development of more effective and inclusive policies for persons with disabilities, ultimately creating an environment that fosters innovation and improves their quality of life (Lee et al., 2018). AI can be applied in various areas such as human resources, accessibility, and customer service to achieve these outcomes (Benko & Lányi, 2009). However, it is important to acknowledge that further research is necessary to fully comprehend and validate this relationship, including investigating ethical considerations and potential negative consequences associated with the use of AI in these contexts. Over the past two decades, the business landscape has witnessed significant advancements in technology and its applications across various sectors, influencing professionals in different fields, including
auditors who play a crucial role in providing decision-makers with necessary information (Afuah & Tucci, 2003; Ping, 2021). This progress has necessitated individuals to acquire new skills and experiences to effectively leverage these technological techniques in achieving organizational and societal goals. Consequently, numerous trends have emerged at the economic and societal levels, advocating for the adoption of advanced technology and its appropriate utilization to serve societal interests and support development and prosperity (Afuah & Tucci, 2003; Ping, 2021).

Sustainable organizational innovation (SOI) is an ongoing process of perceiving, exploring, and learning that enables enterprises to innovate new procedures, explore new markets, and develop new and improved products and services (Eveleens, 2010). Organizational innovation is crucial for company growth, acting as a differentiation tool that creates competitive advantages (Ganter & Hecker, 2014; Moreira et al., 2017). In contemporary times, the nature of work life has gained universal significance, with organizations facing numerous challenges related to human resources, including employee retention (Akdere, 2006). The quality of work life (QWL) is a multi-layered construct influenced by various factors. Achieving a high QWL is essential for attracting and retaining employees, prompting organizations to explore ways to address recruitment and retention issues (Akdere, 2006).

This paper aims to explore how AI can act as a mediator between organizational innovation and the quality of life for persons with disabilities. The primary research question guiding this study is: How does AI impact the organizational innovation processes and outcomes that influence the quality of life for persons with disabilities? To answer this question, the paper will conduct a comprehensive literature review on AI, organizational innovation, and quality of life for persons with disabilities. Additionally, a case study of a university utilizing AI in its administrative tasks will be conducted, and the data will be analyzed. The findings of this research endeavor will contribute to the field of organizational studies by providing evidence and insights into the role of AI in promoting organizational innovation and enhancing the quality of life for persons with disabilities. The most important results of the study were the existence of a statistically significant correlation between the dimensions of AI and the relationship between organizational innovation and quality of life for persons with disabilities, with AI acting as a mediating variable.

The remainder of this article is structured as follows. Section 2 is reserved for the literature review, while Section 3 presents the methods. The empirical results and discussion are provided in Sections 4 and 5. Section 6 is for the conclusion and policy recommendations.

LITERATURE REVIEW

The supporting arguments for The Mediating Role of Administrative Applications of Artificial Intelligence on Organizational Innovation and the Quality of Work Life for Persons with Disabilities are explained in this section, along with pertinent literature, theories, concepts, and preceding studies.
Administrative applications of AI and Quality of work life (QWL) for employees with disabilities

Artificial intelligence (AI) is the use of technology to imitate human thinking and act independently (Benko and Lanyi, 2009; Haenlein and Kaplan, 2019). AI and its technologies, such as machine learning, deep learning, chatbot, neural network, and virtual assistant, are changing how companies do business and organize themselves (Cigref, 2018; Kuzey et al., 2014; Pwc, 2019). AI is also affecting various aspects of human life, such as work, education, health, and entertainment. AI can play a significant role in enhancing organizational innovation and the quality of life for people with disabilities. However, the benefits and challenges of using AI in these areas need more research (Sikdar, 2018). AI has also transformed the structure of organizations and their relationship with their environment. Deloitte Global predicts 87% of companies are using cloud AI, 70% obtaining services through applications, and 65% creating their own. This rapid technological advancement necessitates a re-evaluation of business practices. (Deloitte, 2020).

This creates both a challenge and an opportunity for organizations, but they need to change their culture, mentality, and skills to take advantage of it (Lee et al., 2018; Sikdar, 2018; Di Francesco & Maggi, 2020). Saudi Arabia is developing its AI field in various areas, such as machine learning, natural language processing, machine translation, computer vision object recognition, face recognition, and robots for industrial and personal tasks. These technologies use different types of learning methods, such as supervised learning, unsupervised learning, and reinforcement learning. They also enable automation in various fields (Saudi Data and Artificial Intelligence Authorities, 2023). The administrative applications of artificial intelligence refer to the utilization of AI technology in performing administrative tasks, processes, and functions. These applications are designed to enhance efficiency, accuracy, and productivity across different administrative domains, including finance, human resources, and operations. Previous research studies conducted by Liu et al. (2020), Park et al. (2021), and Zhang et al. (2022) have highlighted the significance of these administrative AI applications.

In the context of Northern Border University, specific administrative applications of AI have been implemented. For instance, the university employs Baner for Disabilities Employees Service, Employees Service, and Blackboard for staff services. These applications are utilized to streamline administrative processes and improve service delivery. This information is sourced from the Northern Border University website (2023). Therefore, the first hypothesis put out is as follows:

H1: There is a positive impact of administrative applications of AI on QWL for employees with disabilities.

Organizational innovation and administrative applications of AI for employees with disabilities.

Organizational innovation is the creation or improvement of new or significantly better processes, products, services, or technologies within an organization. It is a key driver of organizational performance, competitiveness, and efficiency (Afuah & Tucci, 2001; Chesbrough & Rosenbloom, 2002). Innovation is the intentional implementation or introduction of new ideas, procedures, processes, or products that improve an individual, group, organization, or society (Camison & Villar Lopez, 2014). Innovation differs from creativity
as a planned or intentional activity and a valuable tool that helps organizations achieve their goals when daily tools and strategies fail (Khedhaouria & Jamal, 2015). Innovation can be new or incremental and can improve performance and competitiveness. Innovation in services can enhance learning capabilities and market trends that can improve organizational performance (Chen et al., 2016). Organizational innovation can take many forms, such as new business models, new organizational structures, new products, new services, new technologies, new ways of working, and new forms of collaboration. Organizational innovation can be driven by internal and external factors, such as changes in market conditions, customer needs, or industry developments (Tushman & O’Reilly, 1996; O’Reilly & Tushman, 2004).

The research focuses on two prominent dimensions of organizational innovation: speed and quality. Speed of innovation refers to the ability of an organization to reduce the time required to develop and market products or processes compared to its competitors (Wang et al., 2016; Wang et al., 2007). Innovation speed is a team-based competence that enables an organization to respond to customer requests quickly and gain greater market share and profits. Quality of innovation relates to the effectiveness of innovation processes and outcomes and is described as the extent to which an organization can add value to its products or services in terms of their features, cost, reliability, and flexibility (Wang et al., 2016). Quality of innovation helps organizations perform better than their competitors by improving quality management and increasing responsiveness and customer satisfaction (Haner, 2002; Iqbal, 2021). The research defines quality of innovation as the extent to which an organization can add value to its products and services in terms of distinctive features, reliability, flexibility, time, and cost compared to its major competitors in the industry (Haner, 2002; Huang & Li, 2009; Lahiri, 2010; Mardani et al., 2018; Iqbal, 2021). (Morandini et al.2023) research highlights the importance of integrating AI into enterprises to address the skills gap in the workplace. Businesses should map employees’ transversal abilities, assist in adopting AI, enhance existing skills, and provide on-demand training and development opportunities. Therefore, the second hypothesis put out is as follows:

H2: There is a positive effect of organizational innovation on administrative applications of AI for employees with disabilities.

Organizational innovation and Quality of work life (QWL) for employees with disabilities.

There is a growing emphasis on the quality of individuals’ work life, often referred to as employee well-being or work wellness. Quality of Work Life (QWL) has gained attention from management theorists and the business community, although its precise definition and practical application remain somewhat unclear (Kotzé, 2008). In a study conducted by Ramstad (2014), the link between high-involvement innovation practices (HIIPs), productivity, and improvement in the quality of working life in Finnish workplaces is explored. The study highlights the significance of decentralized decision-making, competence development, and project management skills. The concept of Quality of Work Life (QWL) is multidimensional and measures the satisfaction, value, and engagement that employees experience in their work life. QWL is influenced by various factors, including the overall job environment, employee well-being, and innovations aimed at
enhancing employee satisfaction, ultimately leading to improved organizational effectiveness and flexibility (Rantanen et al., 2011; Sergey, 2006). Prioritizing the improvement of QWL to enhance employee happiness and satisfaction can yield several benefits for both individuals and organizations, such as fostering organizational innovation, enhancing the quality of care, and improving overall productivity (Sirgy et al., 2001).

QWL encompasses criteria such as concern, consciousness, capacity, and commitment, as well as the context of work life/home life and the work world dimension (Morin and Morin, 2004). This study focuses on five key factors of QWL: work environment (Sirgy et al., 2012; Ahmad, 2013), occupational stress (Mosadeghrad et al., 2011; Bragard et al., 2015), professional development (Almalki et al., 2012; Lee et al., 2014), compensation and rewards (Nayeri et al., 2011; Swamy et al., 2015), and social support (Purdy et al., 2010; Brunault et al., 2013). The Dean's Office Agency for Persons with Disabilities at Northern Border University provides high-quality services and promoting social empowerment for individuals with disabilities within the university. The agency offers support and assistance to students with disabilities, with a focus on developing their abilities and skills based on their unique needs, enabling them to actively contribute to society. The agency’s objectives encompass empowering, enhancing, providing, facilitating, overcoming, and contributing to the well-being and success of students with disabilities at the university in various aspects (NBU Student's Deanship, 2023).

H3: The dimensions of organizational innovation have a positive impact on QWL for employees with disabilities.

AI Applications, Organizational Innovation, and Disabled Employees' Work Life Quality.
The studies discussed in this paper shed light on various aspects related to job satisfaction, work quality, the impact of artificial intelligence (AI), and the role of digital technologies in promoting inclusion for people with disabilities. These findings provide valuable insights into the experiences and challenges faced by individuals with disabilities in different areas of life, including employment, education, public safety, and healthcare. The systematic review conducted by Kocman, and Weber (2018) reveals that people with intellectual disabilities generally exhibit high job satisfaction. This finding suggests that individuals with intellectual disabilities can derive fulfilment and satisfaction from their work, like individuals without disabilities. However, it is important to note that the importance of factors influencing job satisfaction may vary among individuals with disabilities. This highlights the need for further research that considers established organizational psychology theories and measures to gain a deeper understanding of job satisfaction in this population. Agovino and Parodi (2014) focus on evaluating the quality of work for people with and without disabilities in Italy. Their study employs a fuzzy set theory and identifies seniority and institutional factors, such as Law 68/99, as significant determinants of work quality for disabled individuals. Education also plays a similar role for both groups, but interestingly, it is found to be irrelevant for low-quality jobs. Moreover, gender differences emerge, with women scoring higher in work quality. These findings highlight
the importance of considering contextual factors and gender dynamics in understanding work quality for individuals with disabilities. The potential of AI to impact the fair treatment of people with disabilities is discussed by Trewin et al. (2019). While AI has the potential to enhance various aspects of life for individuals with disabilities, its introduction can also perpetuate existing discriminatory flaws. To ensure fairness, the authors suggest strategies such as reviewing AI systems, providing opportunities for redress, and involving people with disabilities in data sourcing and testing. Additionally, adopting human-centered design processes can help AI engineers develop algorithms that minimize harm and maximize the benefits for people with disabilities. This highlights the importance of an ethical and inclusive approach to AI implementation.

Nugent and Scott-Parker (2022) examine the impacts and concerns of disabled employment seekers using AI systems for recruitment. Research indicates that AI technologies can significantly impact individuals with disabilities seeking employment and career progression. However, there are concerns regarding the accuracy of results and potential disadvantages faced by historically marginalized groups. The paper recommends steps that employers can take to ensure fairness in recruitment innovation, emphasizing the importance of addressing biases and promoting equal opportunities for individuals with disabilities. Varriale et al. (2023) explore the role of digital technologies in promoting social inclusion for people with disabilities, particularly those with cognitive disabilities or autism spectrum disorder (ASD). The adoption of digital technologies has shown improvements in working conditions and overall quality of life for individuals with disabilities. However, it has also led to the emergence of a digital divide, posing challenges for individuals with disabilities, especially in recruitment and work. The study provides valuable insights into the experiences of people with disabilities in Italy and highlights the need for further research on the role of digital technologies in fostering inclusion.

In the context of AI fairness for people with disabilities, Binns, and Kirkham (2021) emphasize the need for a unique approach based on data protection and equality law. They suggest that combining these laws can empower disabled organizations and researchers to shape AI use and challenge harmful practices. This underscores the importance of legal and regulatory frameworks that prioritize the rights and well-being of individuals with disabilities in the development and deployment of AI systems.

Overall, the studies discussed in this paper offer valuable insights into the experiences, challenges, and potential solutions for promoting inclusion and fairness for people with disabilities. By considering the findings from these studies, policymakers, organizations, and researchers can work towards creating more inclusive and equitable environments that enhance the lives of individuals with disabilities. In addition, no previous studies have focused on administrative AI applications to enhance organizational innovation and quality of work life for disabled employees in Saudi Arabia. Further research and ongoing efforts are essential to address the identified gaps and ensure that advancements in technology and workplace practices benefit all members of society. Therefore, the fourth hypothesis put out is as follows:

H4: Administrative applications of AI mediate the relationship between organizational innovation and QWL for employees with disabilities. Based on the literature review and the conceptual model, we plot the Figure 1.
METHODS

We used a structured questionnaire with five-point Likert scale questions to collect data for our survey. We measured “organizational innovation” using the two-item form developed by Wang (2016) and Iqbal (2021), “administrative applications of artificial intelligence” using the four-item form developed by Baltzan et al. (2008), and “quality of life for people with disabilities” using the five-item form developed by Purdy et al. (2010), Mosadeghrad et al. (2011), Nayeri et al. (2011), Almalki et al. (2012), Brunault et al. (2013), Lee et al. (2014), Bragard et al. (2015), and Swamy et al. (2015). We conducted our survey from January to March 2022. The study population consisted of all 55 administrative staff with disabilities at Northern Border University in Saudi Arabia. We selected the participants through a voluntary participation approach after obtaining ethical approval from the university’s deanship of scientific research. We contacted the principals of the selected kindergartens and explained the purpose and procedure of the study.

We also informed the employees about the study during one of their shifts and assured them that their participation was voluntary and confidential. Participants who wanted a result analysis provided nicknames and email addresses that did not reveal their real names on their questionnaires. The final sample size was 41 people who completed the survey, resulting in a completion rate of 74.5%. The male participants’ ages ranged from 28 to 50 years (M = 35, SD = .5). Most participants had a master’s or doctoral degree, while 41.5% and 22% had completed college or secondary school, respectively. Most participants (95.6%) worked full-time or part-time, and 89.1% were married. We collected data through self-administered online surveys. We used SPSS 28.00 to analyze the data and draw conclusions. We used descriptive statistics (mean, mode, frequency tables, variance, etc.) and calculated Cronbach’s alpha for reliability. We used Pearson’s r correlation coefficient and multiple regression analysis with stepwise technique to test the research hypotheses.

Statistical analysis: Cronbach's Alpha Reliability Indicator

Cronbach's Alpha reliability indicator is a valuation meter of the sample response's reliability and the questionnaire's structure itself. A high value of that index (usually more than 0.8) is used as a proof that the reliability of the research carried out is very high. In our case. Cronbach's alpha index was measured at a very high level, and it came (0.902), (0.912) and (0.908) Research variables in a row see (Table 1.)
Table 1. Cronbach's Alpha reliability indicator

<table>
<thead>
<tr>
<th>Research variables</th>
<th>Number of Items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational Innovation</td>
<td>10</td>
<td>0.902</td>
</tr>
<tr>
<td>Administrative applications of artificial intelligence</td>
<td>16</td>
<td>0.912</td>
</tr>
<tr>
<td>Quality of work life</td>
<td>8</td>
<td>0.908</td>
</tr>
</tbody>
</table>

* Source: the results of the statistical analysis

Descriptive analysis is used to determine the availability of research variables from the point of view of the research sample, and the researcher used some descriptive analysis methods such as averages as one of the measures of central tendency and standard deviation as one of the measures of dispersion. Pearson correlation analysis was also used to determine the nature of the correlation between the research variables, and the results were collected in one table and the results were as follows see (Table 2.):

Table 2. Descriptive analysis and correlation between research variables

<table>
<thead>
<tr>
<th>Research Variables</th>
<th>Descriptive analysis</th>
<th>Correlation analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arithmetic mean</td>
<td>standard deviation</td>
</tr>
<tr>
<td>Speed of innovation</td>
<td>3.45</td>
<td>0.425</td>
</tr>
<tr>
<td>Quality of innovation</td>
<td>3.64</td>
<td>0.398</td>
</tr>
<tr>
<td>Administrative applications of artificial intelligence</td>
<td>3.58</td>
<td>0.478</td>
</tr>
<tr>
<td>Quality of work life</td>
<td>3.43</td>
<td>0.579</td>
</tr>
</tbody>
</table>

* Source: the results of the statistical analysis

It is clear from the results in the previous table that the averages of the dimensions of organizational innovation, (speed of innovation, quality of innovation) have reached respectively (3.45, 3.64) standard deviation, (0.425, 0.398) and this indicates that the dimensions of the speed of organizational innovation are available from the point of view of the research sample with medium degrees. Also, the arithmetic averages for both the administrative applications of artificial intelligence and quality of work life respectively (3.58, 3.43) with standard deviation (0.478, 0.579), and this indicates that the research sample feels that the administrative applications of artificial intelligence and the quality of work life offer them to moderate degrees.

With regard to the analysis of the correlation between the research variables, it is clear from the results in the previous table that there is a positive significant correlation between the dimensions of innovation speed and innovation quality) respectively with the administrative applications of artificial intelligence, where the correlation coefficients reached (0.830, 0.881), and there is a positive significant correlation between the dimensions of organizational innovation in their previous order with the quality of work life with correlation coefficients of (0.840, 0.612) respectively. It is also clear that there is a positive significant correlation between the management applications of artificial intelligence and the quality of work life by the value of (0.748).
RESULTS

Testing the validity of research hypotheses

To test the validity of the research hypotheses, the structural equation modelling (SEM) was used according to the (Maximum likelihood) method available in the package of statistical analysis methods (AMOS 21, Ver), and the results of testing the validity of the research hypotheses were as follows:

First hypothesis test

The researcher formulated the proposed model for this hypothesis as in (Figure 2.), and the results of the significant indicators of this model came as shown in (Table 3.), and the results of the statistical analysis as in (Table 4.).

![Figure 2. The proposed model for the first hypothesis of research](image)

Table 3. Significance of the proposed model of the first hypothesis

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Standard value</th>
<th>Calculated value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(GFI)</td>
<td>0.90 &lt;</td>
<td>1</td>
</tr>
<tr>
<td>(PMR)</td>
<td>0.06 &gt;</td>
<td>0</td>
</tr>
<tr>
<td>(NFI)</td>
<td>0.95 &lt;</td>
<td>1</td>
</tr>
<tr>
<td>(CFI)</td>
<td>0.95 &lt;</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: the results of the statistical analysis

It is clear from the previous table that the proposed model of the first hypothesis has succeeded in passing the four indicators and is therefore statistically acceptable.

Table 4. Results of the statistical analysis of the first hypothesis

<table>
<thead>
<tr>
<th>Direct Track</th>
<th>Slope coefficient</th>
<th>Coefficient of Determination</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative applications of AI</td>
<td>Quality of Work Life</td>
<td>0.267</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Source: the results of the statistical analysis

The results of the previous table indicate a positive significant impact of administrative applications of AI on the quality of work life influential with a coefficient of (0.267) at a significant level of (0.01). This indicates a positive significant impact of the management applications of artificial intelligence on the quality of work life for workers with disabilities in the applied entity.

Second hypothesis test

![Figure 3. The proposed model for the second hypothesis of research](image)
The researcher formulated the proposed model for this hypothesis as in Figure 3., and the results of the significant indicators of this model came as shown in (Table 5.), and the results of the statistical analysis as in (Table 6.).

### Table 5. Significance of the proposed model of the second hypothesis

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Standard value</th>
<th>Calculated value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(GFI)</td>
<td>0.90 &lt;</td>
<td>1</td>
</tr>
<tr>
<td>(PMR)</td>
<td>0.06 &gt;</td>
<td>0</td>
</tr>
<tr>
<td>(NFI)</td>
<td>0.95 &lt;</td>
<td>1</td>
</tr>
<tr>
<td>(CFI)</td>
<td>0.95 &lt;</td>
<td>1</td>
</tr>
</tbody>
</table>

*Source: the results of the statistical analysis*

It is clear from the previous table that the proposed model of the second hypothesis has succeeded in passing the four indicators and is therefore statistically acceptable.

### Table 6. Results of the statistical analysis of the second hypothesis

<table>
<thead>
<tr>
<th>Direct Track</th>
<th>Slope coefficient</th>
<th>Coefficient of Determination</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed of Innovation</td>
<td>Administrative applications of AI</td>
<td>0.112</td>
<td>0.026</td>
</tr>
<tr>
<td>Quality of Innovation</td>
<td>0.274</td>
<td>0.003</td>
<td></td>
</tr>
</tbody>
</table>

*Source: the results of the statistical analysis*

The results of the previous table indicate a positive significant impact of organizational innovation dimensions on administrative applications of artificial intelligence. The quality of innovation is the most influential with a track coefficient of (0.274) at a significant level of (0.01), followed by the speed of innovation with a track coefficient of (0.112) at a significant level of (0.05). This supports the first hypothesis, which states that there is a significant positive relationship between organizational innovation and administrative applications of AI for workers with disabilities in the applied entity.

**Third hypothesis test**

The researcher formulated the proposed model for this hypothesis as in (Figure No.4), and the results of the significant indicators of this model came as shown in (Table 7), and the results of the statistical analysis as in (Table 8):

### Table 7 Significance of the proposed model of the first hypothesis

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Standard value</th>
<th>Calculated value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(GFI)</td>
<td>0.90 &lt;</td>
<td>1</td>
</tr>
<tr>
<td>(PMR)</td>
<td>0.06 &gt;</td>
<td>0</td>
</tr>
<tr>
<td>(NFI)</td>
<td>0.95 &lt;</td>
<td>1</td>
</tr>
<tr>
<td>(CFI)</td>
<td>0.95 &lt;</td>
<td>1</td>
</tr>
</tbody>
</table>

*Source: the results of the statistical analysis*
It is clear from the previous table that the proposed model of the third hypothesis has succeeded in passing the four indicators and is therefore statistically acceptable.

<table>
<thead>
<tr>
<th>Table 8. Results of the statistical analysis of the third hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct Track</strong></td>
</tr>
<tr>
<td>Speed of Innovation</td>
</tr>
<tr>
<td>Quality of Innovation</td>
</tr>
</tbody>
</table>

*Source: the results of the statistical analysis*

The results of the previous table indicate a positive significant impact of organizational innovation dimensions on Quality of Work Life. The speed of innovation is the most influential with a track coefficient of (0.207) at a significant level of (0.01), followed by the quality of innovation with a track coefficient of (0.117) at a significant level of (0.01). This supports the first hypothesis, which states that There is a positive moral impact of the dimensions of organizational innovation on the quality of work life for workers with disabilities in the applied entity.

**Fourth hypothesis test**

The researcher formulated the proposed model for this hypothesis as in (Figure 5.), and the results of the significant indicators of this model came as shown in (Table 9.), and the results of the statistical analysis as in (Table 10.):
It is clear from the results in the previous table that the administrative applications of artificial intelligence mediate the relationship between organizational innovation and the quality of work life, where the indirect impact of administrative applications of artificial intelligence between the speed of innovation and the quality of work life reached (0.124) at a significant level (0.001), and it is noted that the total impact increased due to the indirect impact to (0.204), as well as the administrative applications of artificial intelligence mediate the relationship between the quality of innovation and the quality of work life, where the indirect impact reached (0.106) at a significant level (0.001), and the overall effect is increased by the direct effect (0.188). This indicates the acceptance of the fourth hypothesis, which states "AI applications mediate the relationship between organizational innovation and quality of work life for workers with disabilities in the applied entity".

**DISCUSSION OF RESULTS**

This study aims to investigate the relationship between administrative applications of AI, organizational innovation, and the quality of work life (QWL) for employees with disabilities in a northern border university in Saudi Arabia. The specific objectives of the study include examining the positive relationship between organizational innovation and administrative applications of AI for employees with disabilities in the university. Additionally, the study seeks to assess the positive impact of the administrative applications of AI on the QWL of employees with disabilities in the university. Furthermore, the study aims to test the positive influence of the dimensions of organizational innovation on the QWL for employees with disabilities in the university.

According to the study's findings, hypothesis 1 demonstrates a positive relationship between the use of AI in administrative applications and the quality of work life (QWL) for employees with disabilities. In line with hypothesis 2, the study reveals that organizational innovation has a positive impact on the adoption and effective utilization of AI in administrative tasks for employees with disabilities. Moreover, organizations that prioritize innovation are more likely to incorporate and leverage AI in their administrative practices. The study further indicates that the speed and quality of innovation positively influence the implementation of AI in administrative applications. Consequently, organizations that demonstrate rapid and effective innovation are more likely to benefit from AI in their administrative practices. Additionally, the study identifies a positive correlation between the use of AI in administration and the quality of work life for individuals with disabilities. This suggests that organizations that integrate AI into their administrative practices are more likely to establish a positive and supportive work environment for employees with disabilities. These findings are consistent with previous research conducted by Sikdar (2018), Liu et al. (2020), Park et al. (2021), and Zhang et al. (2022).

Hypothesis 3 reveals that the dimensions of organizational innovation positively impact the quality of work life for employees with disabilities. The study establishes a positive correlation between organizational innovation and the quality of work life for individuals with disabilities, indicating that innovative organizations are more likely to create a positive work environment for employees with disabilities. These findings align
with previous research conducted by Wamba-Taguimdje et al. (2020), Correia et al. (2021), Phuoc (2022), and Olan (2022), which also highlight the positive effects of organizational innovation and the use of AI on the quality of work life for employees with disabilities. Hypothesis 4 demonstrates that the administrative applications of AI mediate the relationship between organizational innovation and the quality of work life for employees with disabilities. The study concludes that AI’s administrative applications act as a mediator between organizational innovation and the quality of work life for individuals with disabilities. Thus, AI plays a crucial role in realizing the full benefits of organizational innovation for employees with disabilities. These findings align with previous research conducted by Nugent and Scott-Parker (2022), Varriale et al. (2023), Binns, and Kirkham (2021). Based on these findings, the study recommends that organizations invest in both innovation and the effective utilization of AI to foster a supportive work environment for employees with disabilities and fully harness the potential of organizational innovation. The implications of the study are significant for organizations, as investing in innovation and the effective use of AI can enhance the quality of work life for employees with disabilities. By doing so, organizations can create a more supportive and inclusive work environment for all employees.

CONCLUSION, IMPLICATIONS AND LIMITATIONS

This study examined the impact of artificial intelligence in administrative applications on organizational innovation and quality of life for persons with disabilities. A descriptive analytical approach is used to analyze the relationship between AI and quality of life. A questionnaire is used to collect information. The study found a significant correlation between AI dimensions and organizational innovation. Key recommendations include prioritizing innovation, providing training, investing in AI technology, developing guidelines, fostering collaboration, and establishing ethical policies for AI use in administrative tasks. The findings suggest that AI can improve the organizational innovation and quality of work life for employees with disabilities by enhancing their work conditions, opportunities, and outcomes. However, AI also poses challenges and risks for this population, such as discrimination, exclusion, and digital divide. Therefore, the study recommends developing best practices, conducting comparative and longitudinal studies, investing in supportive technologies, establishing ethical policies and procedures, partnering with educational institutions, and utilizing AI to foster diversity, equality, and inclusiveness for employees with disabilities.

Despite this study is useful for scholars and policymakers, it has some limitations. First, the study examines only the case of Saudi Arabia. Future works may focus on other countries in order to generalize the findings and get specific outcomes. Second, the present study analyzed the higher education sector (university). Other studies may focus on other economic sectors, such industry, health, tourism and other services.

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Informed Consent Statement: Not applicable

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Conflict of interests: The authors declare no conflict of interest.

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SOCIAL ENTREPRENEURSHIP & CORPORATE SOCIAL RESPONSIBILITY DRIVING SUSTAINABLE SOLUTIONS: COMPARATIVE ANALYSIS

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ABSTRACT
The comparative analysis of social entrepreneurship and corporate social responsibility (CSR) holds significant importance in addressing pressing social and environmental issues. This research explores and compares social entrepreneurship and corporate social responsibility (CSR), focusing on their unique attributes, motivations, and impacts. Objectives: The study aims to provide valuable insights for individuals, organizations, and policymakers, helping them address societal and environmental challenges while promoting sustainable development. Methods/Approach: Qualitative research methods, including focus group sessions and in-depth interviews, were employed to scrutinize Georgian social enterprises and CSR initiatives. Data synthesis from multiple sources contributed to the comprehensive analysis. Results: The study underscores the burgeoning significance of social responsibility in corporate pursuits, especially in regions marked by socioeconomic disparities. It emphasizes the delineation between social entrepreneurship and CSR, illuminating how strategic marketing amplifies social responsibility, augmenting product value and competitiveness. Integrating social objectives into business frameworks, transparent communication, long-term visions addressing social issues, and fostering collaboration between social entrepreneurship and CSR are instrumental in cultivating a socially responsible business image and nurturing sustainable economic growth. Understanding these distinctions and synergies is pivotal in addressing societal and environmental challenges while promoting sustainable development. Conclusions: The comprehensive comparative analysis between social entrepreneurship and CSR illuminates their distinct traits and potential collaborative avenues, providing a foundational understanding applicable across diverse regional and industry contexts. Additionally, the study underscores the role of marketing in shaping the perception of socially responsible businesses, inviting further exploration into CSR and social entrepreneurship marketing strategies. Policymakers can leverage these insights to formulate policies that bolster socially responsible endeavours and foster sustainable development within the business landscape.

Keywords: Social entrepreneurship, sustainable development, economic growth, management

JEL classification: A14; B55; M11

Paper type: Research article


INTRODUCTION
Georgia's entrepreneurial landscape is intimately entwined with challenges such as unemployment and social adversities. Addressing these challenges demands a comprehensive understanding of social entrepreneurship and corporate social responsibility (CSR) alongside their respective merits. However, a significant gap in literature persists, particularly regarding the presence of internal CSR policies and practices within social
enterprises (Cornelius et al., 2008). Closing this gap is pivotal for shaping discourse on businesses' societal roles and guiding projects with profound social impacts.

Moreover, a critical need exists to better comprehend how social entrepreneurship projects contribute to sustainable development (Spieth et al., 2019). Policymakers and practitioners require a deeper understanding to harness the potential of social entrepreneurship effectively. Similarly, the impact of social entrepreneurs in addressing environmental challenges requires more attention (Austin et al., 2006) to create support structures and policies aiding sustainability efforts. Hence, the examination and comparison of social entrepreneurship and CSR emerge as critical tools in the quest for efficient, enduring solutions to the multifaceted challenges of our society and environment, charting a course towards a brighter future.

This study embarks on an exploration and analysis of the distinctive attributes and potential of social entrepreneurship and CSR, offering invaluable insights into their advantages and constraints. Through an examination of their impacts, scalability, motivations, and objectives, this research equips policymakers, businesses, and society with the knowledge necessary to formulate effective policies and initiatives for sustainable development.

**Problem Statement:** Despite the importance of understanding social entrepreneurship and corporate social responsibility, there is a conspicuous lack of in-depth comparative analysis, hindering the realization of their full potential in addressing societal and environmental issues. To bridge this gap and drive meaningful change, this research seeks to explore the distinctive traits, motivations, and impacts of these two strategies, offering a comprehensive perspective on their contributions to sustainable development.

**Hypotheses of the Study:**

H1: Companies predominantly perceive corporate social responsibility as a marketing tool.

H2: Companies align their social initiatives with global trends.

These hypotheses were examined and analysed throughout the course of this study to shed light on the true nature and efficacy of these approaches in addressing social and environmental challenges. These hypotheses underwent rigorous examination throughout this study, shedding light on the efficacy of these approaches in addressing societal and environmental challenges.

**Research Questions:**

- How do social entrepreneurship and CSR differ in attributes, motivations, and impacts, and what are the implications for individuals, organizations, and policymakers in Georgia?
- How can the integration of social entrepreneurship and CSR drive positive change, sustainability, and stakeholder needs in contemporary business environments?

**Conceptual Framework:**

Exploring the Intersections of Social Entrepreneurship, Corporate Social Responsibility, and Stakeholder Theory: the proposed theoretical framework offered a robust and structured foundation for conducting research into the intricate and dynamic world of social entrepreneurship, corporate social responsibility, and stakeholder theory. It meticulously encompassed key concepts, influential theories, and empirical findings from the
literature, ensuring that the study would yield valuable insights into these pivotal areas. This well-organized framework provided a thorough basis for understanding how businesses could effectively drive positive change while maintaining their responsibilities to various stakeholders. Ultimately, this research contributed to our overall understanding of how these areas intersected and impacted each other, drawing on basic ideas, well-known theories, and real-world data from scholarly sources. The proposed theoretical framework for this research aimed to investigate the distinct attributes, drivers, and consequences of social entrepreneurship (SE) and corporate social responsibility (CSR), with a particular focus on their contributions to the advancement of sustainable development. The structure of the framework was organized in the following manner:

Corporate Social Responsibility (CSR) referred to the ethical and moral obligations that corporations had towards society and the environment. It encompassed the voluntary actions taken by businesses to address social and environmental issues beyond their legal requirements.

The focal point for comprehending corporate social responsibility (CSR) inside the business setting was Carroll’s Three-Dimensional Model, which was formulated by Carroll, 1979. This influential paradigm presented three fundamental dimensions: economic, legal, and ethical. The aforementioned framework functioned as a fundamental structure that highlighted the ethical and sociological dimensions of corporate social responsibility. This paradigm enabled a systematic evaluation of how organizations strategically managed the intricate terrain of reconciling their economic objectives with their legal and ethical obligations.

Gond et al. (2017) provided significant contributions to the understanding of the impact of corporate social responsibility (CSR) on employee behaviour and motivation. This perspective highlighted the importance of adopting an internal stakeholder perspective when considering corporate social responsibility (CSR). By carefully looking at how corporate social responsibility (CSR) efforts affected employees, one could gain a better understanding of the psychological and social bases of CSR in the workplace. According to the Ribeiro, and Gavronski (2021) stakeholder theory claims that managers should cater for all stakeholders, but employees influence how stakeholders see the company and its impacts.

Social entrepreneurship (SE) refers to the practice of applying entrepreneurial principles and strategies to address social and environmental challenges. It involved the creation and implementation of innovative solutions that aimed

Mair and Marti (2006) presented a unique viewpoint on social entrepreneurship, emphasizing its capacity to enact significant societal and economic transformations. This perspective highlighted the potential of social entrepreneurship as a powerful catalyst for constructive societal change, as it strived to address urgent social issues while also maintaining its economic viability.

Hockerts and Wüstenhagen (2010) emphasized the importance of encouraging collaboration between established businesses and creating sustainable entrepreneurs in the fields of corporate social responsibility (CSR) and social entrepreneurship (SE). Adopting a collaborative strategy was a key part of taking advantage of the synergies that could exist between well-established corporations and socially responsible start-ups. This created a more stable environment that was better for driving positive change.
Key Contributors to the Theoretical Framework:

The integration of Corporate Social Responsibility (CSR) and Social Entrepreneurship (SE) has become a topic of increasing interest and importance in the business world. Dees (1998) and McWilliams and Siegel (2001) made significant contributions to the fields of social entrepreneurship and corporate social responsibility (CSR), respectively. Dees' work provided fundamental knowledge of social entrepreneurship, while McWilliams and Siegel explored CSR activities from a corporate standpoint. These pioneering works served as valuable references for this particular aspect of the framework.

Through the synthesis of these many views, the research shed light on the strategic aspect of corporate social responsibility (CSR) and its smooth incorporation into the overall strategy of a firm. By synthesizing these various perspectives, the research sheds light on the strategic dimension of corporate social responsibility (CSR) and its seamless integration into a firm's overall strategy. Within this section of the framework, particular attention was directed towards the ground-breaking works of Dees (1998), who established the foundational understanding of social entrepreneurship, and McWilliams and Siegel (2001), who examined CSR activities from a corporate viewpoint.

Additionally, the typology proposed by Dyllick and Muff (2015) serves as a valuable tool for categorizing and distinguishing various business operations related to CSR and SE. It emphasizes the significance of differentiating between unsustainable practices and genuine sustainability initiatives, facilitating a more nuanced analysis of the multifaceted impact of these initiatives on society and the environment.

Development of Stakeholder Theory:

The concept of stakeholder theory revolves around organizational management and business ethics. It acknowledges the various groups impacted by corporate entities, including but not limited to workers, suppliers, nearby communities, debt-holders, and more. This theory explores the guiding principles and ethical standards that underlie effective organizational management. It draws from concepts like market economics, social contract theory, and corporations' responsibilities toward society. The strategy's stakeholder perspective combines resource- and market-based elements while introducing a socio-political dimension. A prevalent iteration of stakeholder theory aims to identify the precise stakeholders within a company (known as the normative approach to stakeholder identification) and subsequently analyse the factors influencing how managers consider these entities as stakeholders (referred to as the descriptive aspect of stakeholder importance). Long-held philosophical ideas about society and interpersonal relationships have paved the way for concepts akin to modern stakeholder theory. The term "stakeholder" emerged in 1963 in an internal memo at Stanford Research Institute. Subsequent decades saw a proliferation of stakeholder definitions and theories.

that entities such as employees, customers, suppliers, and competitors influence a company's trajectory. This concept, while debated, has fostered numerous definitions in academic discourse.

Numerous works on stakeholder theory often credit Freeman as its originator. His book "Strategic Management: A Stakeholder Approach" (1984) is widely considered the foundation of the theory. However, Freeman acknowledges various influences, including strategic management, corporate planning, systems theory, and corporate social responsibility. Scholarly exploration of stakeholders' significance and salience is vital in this field. Anticipation of similar concepts under Corporate Social Responsibility emerged in 1968 through an Italian economist, Giancarlo Pallavicini, who introduced an analytical method to assess non-economic outcomes of enterprise with ethical, social, and environmental dimensions.

Recent works contributing to stakeholder theory include Donaldson and Preston (1995), Mitchell, Agle, and Wood (1997), Friedman and Miles (2002), and Phillips (2003). Donaldson and Preston categorize stakeholder theory into three aspects: descriptive, instrumental, and normative. The descriptive aspect delves into understanding firms' characteristics and behaviours. The instrumental aspect connects stakeholder management with corporate goals. The normative aspect establishes moral guidelines for corporate operation. Mitchell et al. classify stakeholders based on power, legitimacy, and urgency attributes, leading to eight stakeholder types with organizational implications. Friedman and Miles introduce compatibility, incompatibility, necessity, and contingency attributes to examine contentious stakeholder-organization relationships. Phillips distinguishes between normative and derivatively legitimate stakeholders based on moral obligation and organizational influence.

Stakeholder theory has gained prominence beyond business ethics and is integral to corporate social responsibility frameworks like International Organization for Standardization ISO 26000 and Global Reporting Initiative GRI. In business ethics, Weiss (2014) showcases integrating stakeholder analysis and issues management to address societal, organizational, and individual dilemmas. Charles Blattberg, a political philosopher, critiques stakeholder theory for assuming that stakeholders' interests can only be compromised or balanced. He advocates for conversation instead of negotiation, promoting a 'patriotic' view of corporations as an alternative. Mansell (2016), a management scholar, contends that applying the 'social contract' concept to corporations, as stakeholder theory does, might undermine market economy principles. It could lead to increased exploitation of weak stakeholders by self-interested managers rather than reducing such opportunities.

**Categories of Stakeholders:** A company's stakeholders are people, organizations, or others with a stake in its operations, activities, and results. They significantly impact the company's actions and performance, or vice versa. Stakeholders can range in prominence and impact, and they frequently have a variety of viewpoints and concerns. Here are a few typical categories of firm stakeholders:
Figure 1. Stakeholders of the company

Source: Authors’ own work

**Shareholders or investors:** Those who possess stock in the corporation are known as shareholders or investors. They frequently worry about the business's financial performance and potential to profit from their investments. (Lehmann, 2019)

**Employees:** The success of the firm is dependent on the individuals who work there. The firm's success affects career advancement, job security, pay, and working conditions.

**Customers** are crucial stakeholders since they buy the company's goods and services. The income and reputation of the firm depend on their contentment and loyalty. (Freeman & Dmytriyev, 2017)

**Partners and Suppliers:** Businesses rely on suppliers for services, goods, and raw materials. In order to sustain the supply chain and guarantee product quality, it is essential to have positive connections with suppliers. (Freeman, Dmytriyev & Phillips, 2021)

**Creditors and Lenders:** Parties that have given the firm credit or loans have a stake in how well-positioned it is financially and, in its capacity, to pay back obligations. (Noked, 2013)

**Government and Regulatory Authorities:** Governmental bodies impose laws and regulations that may influence a company's operations, legal obligations, and general business climate. (Rigby, First & O’Keeffe, 2023)
Local Communities: Businesses frequently operate inside communities, and their activities may influence these communities' social, environmental, and economic well-being.

Rivals: Despite being distant from the business, rivals are essential players because their actions and market trends can affect the company's strategy and decisions.

Media and Public: Public perception and media coverage impact a company's reputation, investor confidence, regulatory scrutiny, and consumer loyalty.

NGOs and Advocacy Groups: NGOs and advocacy groups may be interested in topics connected to business operations, such as environmental protection, human rights, and labor practices. If the company's staff is unionized, trade unions and labor organizations advocate employee interests and engage in labor-related negotiations.

Board of Directors: The company's board members, whom shareholders choose, are responsible for working in the interests of the business and its stakeholders.

Management and Executives: The leadership group of the business is in charge of making choices that impact a range of stakeholders and the success of the business as a whole.

Diverse Aims and Social Responsibility:

Aims: Directors and managers are primarily focused on ensuring the smooth operation and growth of the company. They aim to maximize operational efficiency, achieve strategic goals, and enhance the company's overall performance. Shareholders, also known as investors or stockholders, aim to realize a return on their investment in the company. Their primary interest lies in generating financial gains through the appreciation of the company's stock value and the distribution of dividends. (Bebchuk, Kastiel & Tallarita, 2022).

Roles: Shareholders contribute capital to the company by purchasing shares and thus become partial owners. They have the right to vote on certain corporate matters and expect the company's management to make decisions that enhance shareholder value. (Freeman & Velamuri, 2021) Directors, who typically constitute the board of directors, provide oversight, set company strategies, and make critical decisions. Managers are responsible for executing these strategies, managing day-to-day operations, and optimizing resources to achieve organizational objectives. (Larcker & Tayan, 2020)

While directors, managers, and shareholders all play essential roles in a company's success, their aims often differ due to their respective positions and perspectives. Directors and managers focus on operational effectiveness and growth, while shareholders prioritize financial returns and the overall value of their investments. For example, the Directors recognize that the company's actions and decisions impact various stakeholders and the community at large. They emphasize ethical behaviour, environmental sustainability, and corporate social responsibility to maintain a positive image, mitigate risks, and contribute to the greater good. They found that for developed countries, the environmental carbon footprint had a significant negative impact on subjective well-being (Todorov, Aleksandrova, & Ismailov, 2023). Shareholders, especially those focused on short-term gains, might prioritize financial performance over social responsibility initiatives (Todorov, Aleksandrova, & Ismailov, 2023). However, there is a growing trend of socially conscious investors who
consider a company's ethical practices and impact on society. Directors play a pivotal role in setting the tone for the company's social responsibility initiatives. They develop and implement policies that align with the company's values, address environmental concerns, ensure fair labor practices, and engage with local communities. (Arikan, Kantur, Maden, & Telci 2016). Shareholders can influence a company's social responsibility efforts through their voting power and engagement in shareholder meetings. They can advocate for sustainable and ethical practices, encouraging the company to prioritize social and environmental concerns.

Balancing the diverse aims of directors and shareholders with the social responsibility of the company is a challenge. Directors need to communicate the long-term benefits of responsible practices to shareholders, showing how they can contribute to the company's stability and reputation. Shareholders, in turn, should recognize that ethical practices can positively impact a company's performance over the long run. Companies that successfully navigate this balance are better positioned to create sustainable value while meeting their social responsibilities.

Social Entrepreneurship (SE): Mair and Marti (2006) provide a distinctive perspective on social entrepreneurship that centers around its transformative role in driving both social and economic change. This viewpoint underscores the capacity of social entrepreneurship to be a dynamic force for positive societal transformation, as it endeavours to tackle pressing societal challenges while simultaneously sustaining itself economically.

In the realm of social enterprises, various stakeholders play crucial roles. These stakeholders encompass the founders, employed individuals, their family members, civil society organizations, government representatives, donor organizations, and consumers who choose the product or service due to the social enterprise's unique status. Each of these groups assumes a distinctive role in relation to the social enterprise. The founders, donors, and community organizations are the pillars providing resources, showing a strong interest, and holding the potential to safeguard and champion the interests of these enterprises. They serve as the backbone of support and advocacy. On the other hand, employees, their family members, and customers maintain a more neutral stance, yet their contributions are equally significant in the enterprise's growth and successful operation. Their involvement is pivotal, albeit less outspoken. Meanwhile, government agencies possess the means to both facilitate and obstruct the enterprise's progress. They hold the keys to promotion as well as potential obstacles. Their role is pivotal, wielding influence over the enterprise's path. These diverse roles are founded on the specific information needs and varying levels of interest of each stakeholder group, shaping the dynamics within the social enterprise ecosystem.

Collaborative Approach: Hockerts and Wüstenhagen (2010) underline the critical importance of fostering collaboration between established corporations and emerging sustainable entrepreneurs within the realms of CSR and SE. This collaborative approach is pivotal for harnessing the potential synergies between established corporate structures and innovative, socially responsible start-ups, fostering a more robust ecosystem of positive change.
The proposed theoretical framework offered a robust and structured foundation for conducting research into the intricate and dynamic world of social entrepreneurship, corporate social responsibility, and stakeholder theory. It meticulously encompassed key concepts, influential theories, and empirical findings from the literature, ensuring that the study would yield valuable insights into these pivotal areas. This well-organized framework provided a thorough basis for understanding how businesses could effectively drive positive change while maintaining their responsibilities to various stakeholders. Ultimately, this research contributed to our overall understanding of how these areas intersected and impacted each other, drawing on basic ideas, well-known theories, and real-world data from scholarly sources.

**METHODOLOGY**

The research methodology employed in this study was designed to comprehensively investigate and analyse Georgia's social enterprises and corporate social responsibility (CSR) initiatives. To achieve the research objectives, a combination of qualitative and desk-research approaches were utilized, specifically, the proposed theoretical framework offered a robust and structured foundation for conducting research into the intricate and dynamic world of social entrepreneurship, corporate social responsibility, and stakeholder theory. It allowed for the synthesis of data from multiple sources, ranging from published literature to direct interactions with industry professionals, to gain a comprehensive understanding of the subject and draw meaningful conclusions from the research findings.

**Selection of research target groups:** As part of the qualitative research component, a series of ten focus group meetings were conducted. The sampling process for the focus group aimed to ensure a representative and diverse selection of companies in Georgia. The study targeted two distinct categories of enterprises: Category I - social enterprises and Category II - companies openly declared about their Corporate Social Responsibilities. Category I has been chosen from the pool of 43 members of the Social Enterprise Alliance of Georgia (2022). Invitations were offered to representatives from these 43 social enterprises to partake in the focus group, and 22 agreed.

Category II - invitations distributed to 120 companies, carefully chosen from a pool of 693, with a focus on their reported social corporate responsibility initiatives. The selection process aimed to encompass a diverse representation across sectors, geographical locations, and company sizes. Among these, 34 companies consented and were purposefully chosen to participate in the subsequent focus group analysis.

**Data collection:** These sessions allowed for in-depth discussions, idea sharing, and the collection of qualitative insights from individuals with direct experience in the field. 92% of focus group respondents from social enterprises hold top management positions and as for the classical (commercial) business companies, 46% of respondents occupied the high or middle-level management positions. The focus group meetings were instrumental in collecting nuanced insights, perspectives, and first-hand experiences related to social enterprises and corporate social responsibility efforts in Georgia.
Data Analysis: Applied thematic analysis to the qualitative data obtained from the focus group sessions, identifying common themes, patterns, and unique insights. To facilitate a comparative analysis of the activities and outcomes of various entities, the social initiatives undertaken by both traditional businesses and social enterprises were categorized. This categorization was based on key criteria such as the content of the initiatives, their scope, the sector they operated in, the size of the organizations, and their geographical locations. This approach enabled a comprehensive understanding of the subject matter and helped highlight similarities and differences among the approaches taken. This sampling strategy ensured a comprehensive exploration of the social entrepreneurship landscape in Georgia, incorporating the perspectives of both social enterprises and traditional Category I and II enterprises based on specific financial criteria. The focus group composition aimed to capture a holistic understanding of the diverse approaches to CSR within the business community in the region.

RESULTS

The study has revealed the following key findings:

*The Role of "Social" Integration in Business:*

98% of respondents in the study emphasized the importance of incorporating the term "social" into business strategies as a means to simultaneously pursue commercial and social objectives. A variety of real-world examples of companies' social projects and responsibilities in Georgia, covering non-formal education, milk production, environmental protection, waste management, and employee training and development demonstrate companies' dedication to addressing a range of social and environmental challenges in their regions. Only 2% of questioned commercial enterprises think that social issues move beyond the scope of the business sector and ought not to represent its principal area of concern. This finding aligns with the overarching perspective that both social enterprises and conventional businesses can effectively address the challenges faced by specific communities or social clusters by embracing social goals. This integration not only benefits society but also provides significant advantages to the enterprise and its customer base.

*Distinguishing Social Entrepreneurship and Corporate Social Responsibility (CSR):*

It has become evident that Social Entrepreneurship and CSR are distinct approaches in addressing social and environmental issues, each characterized by its unique purpose, profit-sharing model, stakeholder engagement, and risk considerations.

*Social Entrepreneurship:*

This approach is primarily motivated by a core mission to tackle specific social problems and create sustainable social impact. Profits generated within social entrepreneurship are typically reinvested in the enterprise or channelled toward creating additional social benefits. Social entrepreneurship prioritizes engagement with a broader range of stakeholders, including vulnerable groups and external partners, to ensure the success of its social mission. Risks undertaken in social entrepreneurship are primarily geared towards benefiting the target beneficiaries, with a strong focus on achieving positive social outcomes. The current
research indicated that 64% of surveyed enterprises aim to achieve the so-called open labor market social goal. These enterprises engage in activities such as employing less competitive labour force at the open labour market (57%), creating products (33%), providing social services to users, and offering various services such as landscape design, yard landscaping, cleaning, waste collection, and recycling, as well as non-formal education services for ethnic minorities and others. Furthermore, social enterprises actively prioritize the employment of individuals from vulnerable groups, including persons with disabilities, internally displaced persons, those living below the poverty line, single parents, and representatives of various ethnic, religious, and sexual minorities. Many individuals may belong to multiple social groups concurrently, such as a displaced person who falls under the categories of both poverty and disability.

**Corporate Social Responsibility (CSR):**

In contrast, CSR is embedded within traditional for-profit companies, where the primary objective is profit maximization while also considering the social and environmental impact of their operations. In CSR, profits are primarily distributed to shareholders and investors, with some funds allocated to CSR initiatives. Stakeholder engagement in CSR primarily centers around employees and shareholders, with limited interaction with external stakeholders. Risks associated with CSR initiatives are undertaken to enhance the company's reputation and brand, rather than directly addressing social issues. Although some traditional businesses offer similar types of social and environmental services or services focused on assisting specific social groups. In fact, 68% of surveyed enterprises implement such projects on a short-term or one-time basis, and their sustainability is linked to the company's marketing and strategic goals.

The Table 1 provides a visual representation of the specific criteria that distinguish between social enterprises and business Corporate Social Responsibility.

<table>
<thead>
<tr>
<th>Description</th>
<th>Social Entrepreneurship</th>
<th>Corporate Social Responsibility (CSR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>Address specific social problems and create long-term social impact</td>
<td>Maximize profits while considering the social and environmental impact</td>
</tr>
<tr>
<td>Profit Sharing</td>
<td>Profits are reinvested in the enterprise or used to create additional social benefits</td>
<td>Profits are primarily distributed to shareholders and investors, with some CSR initiatives</td>
</tr>
<tr>
<td>Stakeholder Engagement</td>
<td>Engages with a wider range of stakeholders, including vulnerable groups and external partners</td>
<td>Primarily focuses on employees and shareholders, with some engagement with external stakeholders</td>
</tr>
<tr>
<td>Risks</td>
<td>Risks are undertaken for the benefit of beneficiaries</td>
<td>Risks are undertaken for the benefit of the company’s owners or investors</td>
</tr>
</tbody>
</table>

*Source: Authors' own work*
The distinctions between social enterprise and business social entrepreneurship stem from the underlying motivations driving the establishment of these enterprises. Our research findings underscore the critical role that these motivations play in shaping effective engagement and communication strategies. Social enterprises are typically driven by a long-term vision aimed at addressing specific social issues. In contrast, traditional businesses often undertake social projects in response to societal demands or to bolster their reputation. These differing motivations fundamentally shape their approaches. Remarkably, 37% of the surveyed companies view corporate social responsibility as a strategic investment. Such an approach not only enhances their appeal to foreign investors but also bolsters their overall investment attractiveness. Additionally, 42% companies believe that maintaining a strong reputation and image in the business world is intricately tied to the implementation of social projects. Furthermore, 21% companies posit that their involvement in social issues is guided by emotional factors and impromptu decisions. In stark contrast, 100% of the surveyed social enterprises we examined unequivocally place the achievement of a specific social goal at the core of their existence. They view economic activity as a means to achieve this overarching social objective.

Targeting Specific Communities and Stakeholders: the research revealed that both, social enterprises and traditional businesses find addressing challenges faced by specific geographic communities, cultural groups, or social clusters appealing. It aligns with the theoretical framework, which recognizes that stakeholder theory is integral to corporate social responsibility frameworks. Companies’ actions and decisions impact various stakeholders and the community, emphasizing the importance of engaging with different groups.

DISCUSSION
In the realm of business dynamics, the interplay between ‘social’ integration stands as a pivotal force, encapsulating the nuanced facets of Social Entrepreneurship and Corporate Social Responsibility (CSR). This discussion explores the distinct realms and intricate nuances between these paradigms, delineating their motivations and strategic perspectives. Focused on targeting specific communities and stakeholders, it navigates the complexities of inclusive approaches. Moreover, it delves into the complicated landscape of impact assessment and the challenges inherent in performance management, thereby illuminating the terrain for future research implications in fostering holistic and sustainable business models. Specifically:

The Role of ‘Social’ Integration in Business: The overwhelming consensus among respondents (98%) on the importance of integrating the term ‘social’ into business strategies is a significant revelation. This aligns seamlessly with contemporary expectations for businesses to go beyond profit maximization and actively contribute to societal welfare. Real-world examples from Georgia vividly demonstrate the breadth of corporate dedication to addressing diverse social and environmental challenges. Importantly, this finding reinforces the notion that both social enterprises and traditional businesses can be powerful agents for positive change when embracing social goals. The dual impact on society and the enterprise itself underlines the symbiotic relationship between social and commercial objectives.
Distinguishing Social Entrepreneurship and Corporate Social Responsibility (CSR): The distinctiveness between Social Entrepreneurship and CSR is a pivotal contribution of this study, providing a nuanced understanding of their unique characteristics. The visual representation in Chart 2 encapsulates the disparities in purpose, profit-sharing, stakeholder engagement, and risk considerations. Notably, the research illuminates the motives driving social entrepreneurship's focus on sustainable social impact, as opposed to CSR's emphasis on profit maximization. The detailed breakdown of social entrepreneurship activities, with 64% aiming for the open labor market social goal, provides rich insights into the diverse initiatives undertaken by enterprises with a social mission. This section not only clarifies conceptual differences but also underscores the practical implications of these approaches.

Motivations and Strategic Perspectives: The discussion effectively delves into the motivations shaping the actions of surveyed companies. The revelation that 37% of companies view CSR as a strategic investment highlights a pragmatic approach toward attracting foreign investors. Additionally, the acknowledgment that 42% of companies tie a strong reputation to social projects underscores the interplay between social responsibility and brand image. These strategic perspectives align with theoretical frameworks that posit CSR as a multifaceted tool, serving both economic and reputational objectives. In stark contrast, the unequivocal commitment of 100% of social enterprises to a specific social goal emphasizes the distinct, mission-driven nature of their existence.

Targeting Specific Communities and Stakeholders: The alignment of both social enterprises and traditional businesses in addressing challenges faced by specific communities and stakeholders reinforces the importance of stakeholder theory in the realm of corporate social responsibility. The research findings resonate with the theoretical framework, emphasizing the interconnectedness between companies' actions and the diverse stakeholder landscape. This alignment highlights the potential for businesses, regardless of their organizational model, to positively impact communities by understanding and engaging with various stakeholder groups.

Impact Assessment and Performance Management Challenges and Future Research Implications: The discussion aptly acknowledges the challenges faced by social enterprises in assessing their results. This aligns with broader discussions on the complexity of measuring social impact, which is inherent to the hybrid nature of social entrepreneurship. The mention of limited resources and competency gaps in systematic data collection and analysis suggests avenues for future research. Further exploration could focus on developing robust evaluation frameworks tailored to the unique characteristics of social enterprises, fostering a culture of measurement, and addressing competency challenges.

In general, the discussion successfully integrates theoretical perspectives with empirical findings, providing a nuanced understanding of the role of ‘social’ integration in business, the distinctions between social entrepreneurship and CSR, and the motivations guiding companies' social initiatives. This revised section strengthens the article's coherence, relevance, and the author's demonstration of deep theoretical and practical knowledge.
CONCLUSION

In conclusion, this study has shed light on the notable distinctions between corporate social responsibility and social entrepreneurship. The main objective of the enterprise is the primary distinguishing aspect between these two approaches. Social businesses are characterized by their dedication to a social mission and their commitment to addressing specific needs within the community. In contrast, corporate social responsibility enables companies to choose social causes that are in line with their strategic objectives. By grasping this critical differentiation, we gain a clearer understanding of the unique characteristics of each approach and can more effectively assess their impact.

Furthermore, the study underscores the most optimal approach to simultaneously pursue both commercial and social objectives - the incorporation of the term "social" into business operations. This strategy offers substantial advantages, especially for large companies, and is essential for meeting the evolving demands and expectations of today's world. The findings emphasize that reliability and a strong reputation are of paramount importance to stakeholders and are closely connected to active engagement in the social sphere.

The research also highlights the role of marketing in shaping the image of a socially responsible business. Many companies integrate their social responsibility initiatives into their marketing strategies, often employing dedicated personnel to accentuate their policies and actions. This underscores the significance of projecting a socially responsible business image, not only as a marketing tool but as a means to enhance the social value and competitive advantage of their products. Based on the aforementioned findings, it becomes apparent that the incorporation of social responsibility into corporate practices is not only recommended but essential for fostering sustainable economic growth in the state of Georgia.

Understanding the distinctions and similarities between corporate social responsibility and social entrepreneurship is vital for effective engagement, communication, and decision-making. Social enterprises have a long-term vision to address specific social problems, while traditional businesses may engage in social projects to respond to societal demands or enhance their reputation.

The research underscores the significance of social entrepreneurship in creating sustainable economic models in Georgia, particularly in addressing social inequality, unemployment, and dependence on state aid. It also highlights the importance of recognizing the complementary nature of these approaches and seeking areas of synergy to create a more sustainable and socially responsible corporate environment.

In conclusion, a comparative analysis of social entrepreneurship and corporate social responsibility is crucial for understanding their unique characteristics, evaluating their effectiveness, fostering collaboration, and guiding decision-making processes. This approach enables the development of innovative solutions to social issues and the establishment of a more sustainable and socially responsible corporate landscape. According to the research findings, H1 is confirmed, and H2 is only partially proved because companies tend to focus on social responsibility initiatives at the micro level, which is evident in their projects.

Based on these insights, we recommend that businesses in Georgia and beyond consider the following:
1. Embrace the integration of social goals into your business operations to reap the benefits of an enhanced reputation and increased stakeholder satisfaction.

2. Prioritize clear and transparent communication with customers and the public regarding your social initiatives to distinguish them from corporate social responsibility efforts.

3. Develop a long-term vision for addressing specific social issues in your community, as this can propel both social enterprises and traditional businesses toward meaningful and sustainable contributions.

4. Foster collaboration and synergy between social entrepreneurship and corporate social responsibility to create a more socially responsible and economically sustainable corporate environment.

5. Continue to project a socially responsible business image through marketing and other activities, enhancing the social value and competitive advantage of your products.

By following these recommendations, businesses can play a significant role in creating positive social and economic change while meeting the demands and expectations of today's world.

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ESG RATING OF CAPITAL'S EFFECT ON FIRMS' FINANCING SOURCES: A CASE STUDY OF ASIAN COMPANIES

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ABSTRACT

The study is aimed at presenting the relationship between corporate social responsibility (CSR) and the effect of the work of companies and areas of possible implementation in the largest Asian companies. Corporate social responsibility positively affects a company's business reputation and builds trust with customers who value improved financial performance.

Objectives: The purpose of the study is to find any correlation between CSR and firm performance in Kazakhstan and allows for improvement of both the enterprise sustainable development management model and its assessment.

Results: Analytical observation, monitoring, and comparison formed the basis of researching the CSR programs of selected companies. NPM, ROA, ROE, and NPM for leading Kazakh enterprises, the augmented Dickey-Fuller unit root test, and the Student's t-test indicate a correlation between CSR practices and NPM, which is an indicator of profitability. Kazakh companies show a connection between CSR practice and firm efficiency, but this only occurs through net profit margin. The analysis revealed a relatively weak quantitative relationship between the main indicators of stock market activity for companies and their net income. The results provide the basis for the hypothesis that business activity indicators in stock markets today are influenced not only by financial performance indicators. One of the key factors influencing companies' positions in stock market indices is their reputation (image) capital, which affects key indicators and ESG market ratings.

Conclusions: Research data indicate the mixed impact of Corporate Social Responsibility (CSR) on corporate financial performance, with evidence of positive, negative, and insignificant relationships. Investing in CSR can enhance a company's value if certain thresholds are met. Companies are recommended to invest more in the social aspects of CSR to boost competitiveness and profitability. The results of the study are consistent with the theory and confirm the fact that CSR practices and firm performance are correlated. The association between CSR activities and financial performance was tested, and the results show that there is a positive correlation among those variables studied in Kazakhstan. The social responsibility of enterprises in Kazakhstan should be considered in two aspects: as a necessary cost item and as strategic reputational investments that contribute to the creation of a more sustainable global world and positively correlate with the financial position of the company.

Keywords: CSR, profitability, responsible investment, corporate governance, financial performance, KASE, ratio analysis.

JEL classification: A13; G30; M14; M21; O53

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INTRODUCTION

Slowing down the global economic recession requires stimulating economic growth and investment, which necessitates a shift in traditional investment objectives from profit maximization and risk minimization to achieving a balance between financial and non-financial goals through the adoption of responsible investment strategies. Such strategies are derived from the concept of sustainable development and contribute to achieving sustainable development goals, ultimately reducing the role of government regulation (Kalabina, Gazizova, Khussainova, 2021; Khussainova et al., 2023; Kurmanov et al., 2019; Iliev et al., 2023; Seitzhanov et al., 2020; Zhartay, Khussainova, Yessengeldin, 2020). Sustainable consumption represents a departure from conventional consumption patterns that are widespread in the Global North and prioritise economic growth and individualistic materialism and requires a more conscious and responsible approach to consumption that seeks to minimise environmental impact, promote social justice, and improve overall well-being (Ismailov & Krivins, 2023).

Long-term responsible investment strategy for companies entails aligning investment decisions with a company’s ESG (environmental, social, and governance) rating and its financial instruments, including risk and return analysis. Financial crises and accounting scandals, such as the situation with Volkswagen, where the German company lost over $50 billion in stock market value due to proven fraud in financial reports, and other similar events, have had a catastrophic impact on reputation and caused harm not only to the company but also to investors, financial markets, and society as a whole. The influence of ESG ratings on a firm's financial condition is undeniable, as is the increasing motivation of investors in the stock market.

From the perspective of economic theory, the development of a corporate social responsibility (CSR) strategy for a company is an integral component of effective enterprise operation, as it enhances the company's relationship with society and plays a crucial role in the economic development of individual enterprises and countries. Modern business in Kazakhstan and the world in general cannot be isolated from its most important stakeholders, and the implementation of corporate social responsibility indirectly establishes the connection: corporate social responsibility - stakeholders - increased enterprise efficiency.

Corporate social responsibility (CSR) can be defined as a tool for applying the concept of corporate sustainability. It encompasses practices and policies reflecting a business organization's responsibility to society, often referred to as "giving back to society" in return for the resources it receives. Social responsibility is a management strategy adopted by companies of all sizes, sectors, or types, whether for philanthropic, ethical, or competitive differentiation reasons, offering opportunities to gain a competitive edge.

In the modern context, sustainable management corporate reporting is a crucial indicator of business reliability and stability, signaling long-term goals, and serving as a guarantee of corporate responsibility to customers, society, and the environment.

The term “corporate social responsibility” gained popularity in the 1960s and has remained a term used broadly by many to encompass legal and ethical responsibilities. In business practice, CSR encompasses activities such as organizing charity events, providing environmental care, and promoting social interests. CSR
has gained increasing global significance and is predicted to participate. CSR practices can be influenced by CSR competencies and orientation, affecting CSR commitment.

Firms in emerging economies pay more attention to CSR due to their image and the need to attract foreign investments. Investors tend to favour companies with CSR practices, and firms with more CSR practices tend to have better capabilities. Financial performance and CSR activities are strongly related, especially in emerging economies.

Research on ethics and CSR in Asia, particularly in regions like South and Southeast Asia, remains underdeveloped. CSR-related research in emerging economies focuses on fields suitable for their economic and political contexts but often overlooks the financial and accounting performance of companies. The study aims to bridge this gap by examining the profitability of companies and their CSR activities.

CSR and profitability are interrelated because successful and prosperous companies can afford CSR practices. Kazakhstan, as an emerging economy, presents an opportunity to study this relationship, given its rapid economic growth and the presence of successful corporations, especially in the oil and gas sector. This study is a pioneering effort to investigate the link between CSR and profitability in an emerging economy like Kazakhstan.

LITERATURE REVIEW AND HYPOTHESIS

Corporate social responsibility (CSR) initiatives and their influence on corporate financial performance have been actively researched by different authors worldwide. The term means how the company contributes to the preservation of the environment by reducing air pollution and issuing green bonds. At the same time, environmental, social, and governance (ESG) initiatives cover social issues such as caring for employees by providing good work conditions, effective human capital management, and health and safety programs (Harmsone, 2021).

Fatemi et al. (2018) examined the influence of ESG activities and their disclosure on firm market value by using a two-stage model for 403 US companies from 2006 to 2011. The authors confirmed that the interrelationship between ESG activities and firms’ financial performance is strictly positive. Moreover, they assumed ESG disclosure helps companies differentiate themselves from less successful performers and escape the effects of adverse selection. Furthermore, Fatemi et al. (2018) explained the second result, which demonstrates that strengthening ESG transparency might be interpreted by the market as the company’s effort to justify unnecessarily excessive investments in ESG activities.

Bhaskaran et al. (2020) confirmed that companies investing in ESG projects tend to enhance their market value. Share prices tend to increase as a result of ESG projects. The authors highlighted other factors strengthening these relationships. For example, cash-rich companies tend to invest more in environmental activities that help reduce air pollution emissions, which appeals to investors. In addition, Bhaskaran et al. (2020) emphasized that companies are actively investing in welfare initiatives to create higher firm value and
operating performance because highly motivated workers will demonstrate increased productivity in a more favorable working climate.

Interestingly, Duque-Grisales and Aguilera-Caracuel (2019) found a negative interrelationship between ESG activities and firms’ financial performance while analyzing the financial data of 104 multinational companies headquartered in Latin America from 2011 to 2015. The authors mentioned that Latin American firms differ considerably from their competitors in developed markets in managerial, cultural, ethical, and social practices. Also, Latin American firms may not consider ESG activities as a priority, because these initiatives are invisible and financial resources are constrained there. Latin American companies suffer from a scarcity of financial resources, and their managers focus on operating business activities to survive rather than expensive ESG projects. However, the authors identify that if the availability of funding increases, investment in ESG projects will begin positively affecting corporate financial performance.

Duque-Grisales and Aguilera-Caracuel (2019) determined that the higher the international sales of the firm, the stronger the positive influence of ESG activities on corporate financial performance. Foreign businesses and investors may bring ESG activities and teach local businesses to perform them. Foreigners may demand local companies to become active in ESG initiatives, whereas foreign investors can provide additional funding for such initiatives. Previous empirical work on CSR and profitability demonstrates debatable results. The negative relationship between CSR and profitability was proved by Anderson et al. (1980). At the same time, Roman et al. (1999) and Wood and Jones (1995) argued that stable causal relationships were found between CSR and the performance of the firms. A strong positive relationship between CSR and profitability was found by (Shapiro 1987), and (Donaldson and Preston, 1995).

McGuire et al. (1988) found a positive relationship between prior profitability and corporate social responsibility as well. They mentioned that firms with high productivity indicators can ensure the level of their social responsibility at a high level (Hammond et al., 1996). Mostly, those firms are large businesses with a strong credit rating. Margolis et al. (2003) noted that approximately half of the research did not find a correlation between corporate social responsibility and profitability. Mc Guire and Sandgren (1988) mentioned the fact that market returns have some advantages over accounting-based measures and other profitability ratios.

Mochales & Blanch (2021) emphasize that the brand capital projected by CSR initiatives has a positive impact on the strategic nature of CSR and can also contribute to the company's efficiency.

Cho et al. (2019) analyzed the systemic relationship between the results of corporate social responsibility (CSR) and the financial performance of the company. The researchers analyzed data on 191 firms from South Korea. To determine the effectiveness of CSR, researchers took into account the index of the Korean Institute of Economic Justice for 2015. At the same time, the firm's profitability and value were analyzed as a tool for measuring the company's financial performance. Return on assets was used as a proxy for profitability, and Tobin’s Q was used as a proxy for firm value. They discovered a strong positive correlation between the growth of assets and the CSR activities of a company.
Waddock et al. (1997) argued that corporate social performance is found to be positively associated with the prior performance of a company, while (McWilliams et al., 2000) mentioned the idea that the model should be properly specified. The results of their study support the idea of neutrality. They claim that CSR has a neutral impact on financial performance. Financial performance and CSR activities are two variables, which attract the interest of academicians nowadays. Two variables are related when the traditional statistical method is employed. However, when a time series fixed effect approach is employed, the results show a weaker correlation between CSR and financial performance.

Al-Malkawi et al. (2018) performed a meta-analysis to find out the relationship between corporate social performance and accounting-based along with market-based indicators. The results of this research show that corporate social performance and accounting-based indicators are highly correlated. At the same time, there is no correlation between corporate social performance and market-based indicators. Studies examining the relationship between corporate social responsibility and accounting-based performance measures have found significant positive results (Parket et al., 1975).

Popova et al. (2019) discussed the issue of CSR or, more recently its corporate social responsiveness and its financial and accounting performance and revealed positive relationships between corporate social responsibility and asset age. Baumann-Pauly (2015) reported the results of his qualitative empirical study of corporate social responsibility in Swiss MNCs and SMEs, and the author suggests that the smaller the firms, the much less they implement CSR strategies in their organization than large firms (Al Ani et al., 2015). According to this author, small firms have several organizational parameters that pragmatically promote the internal implementation of CSR practices. At the same time, if we talk about large firms, the latter has several characteristics that allow for the promotion of further external communication and reporting on CSR projects, but at the same time limit the processes of internal implementation. Accepting this fact, we hypothesize that large companies in Kazakhstan and Russia are more socially responsible.

The phenomenon of CSR was also studied in the context of the following scientific vectors: 1) An exploration of the relationship between CSR initiatives and excess work ethic (Ali, 2021). The findings of the study reveal that CSR perception of employees negates the excessive work ethic but the introduction of a higher level of organizational identification due to work meaningfulness indirectly positively affects excess work ethic with pro-environmental orientation as a moderator; 2) Firm acceptance of CSR initiatives and organizational commitment of employees to CSR (Lin et al., 2021); 3) The role of perceived CSR motive and perceived CSR fit on CSR authenticity and mediation effect of OPR and reputation on supporting behaviours (Kim et al., 2021); 4) The strategic intersection of HR and CSR (Ikhide et al., 2021); 5) The role of CSR in corporate strategy (Nwe & Ozmel, 2021; Fedorov et al., 2023); 6) Effect of the CSR committee and CSR-linked executive compensation on CSR performance (Radu & Smaili, 2021). The authors of the study believe that the CSR Committee has both direct and indirect positive effects on the effectiveness of CSR, with CSR-related compensation acting as a mediator in the relationship; 6) Correlations between strategic management and CSR (Roszkowska-Menkes, 2021). Under modern conditions, corporate reporting of sustainable
Management is an important indicator of reliability and stability of business, a marker of its long-term goals and intentions, a guarantor of corporate responsibility of business to customers, society, and the environment. (Zamlynskyi et al., 2023).

Recently, CSR research has expanded its geographical coordinates. In particular, scientific analyzes were carried out on 1) A CSR-based reputation study of Spanish companies in Latin America (Farber & Charles, 2013); 2) CSR and investment efficiency in Western European countries (Ben Khediri, 2021); 3) CSR in the Scandinavian countries (Munkelien et al., 2018); 4) Legalization of CSR in the Philippines (Madanguit, 2021); 5) Prevalence of CSR reporting in Arab countries (Ismaeel et al., 2021); 6) CSR in BRIC countries (Crotty, 2014); 7) Internal and external determinants of corporate social responsibility practices in multinational subsidiaries in Ethiopia; 8) Internationalization and internationalization of CSR practice for a Japanese multinational company (Perera & Hewege, 2021); 9) Overview of CSR activities in India (Dadas, 2021).

The financial viability of the company, as well as the conditions under which the company achieves strategic growth points based on accounting and analytical indicators, such as the company's return on assets (ROA), return on equity (ROE) or earnings per share (EPS), Market Value of stock, Net Profit Margin reflect the company's internal performance, respectively, most indicators of financial results are divided into: investor income and accounting income. Financial management develops a sustainable investment strategy that takes into account financial results in the context of the investor's income and the accounting financial result of the company. A necessary condition is the allocation and structural presentation of part of the capital for systemic sustainability improvements. Sustainable financial products and their use to promote sustainable development, play a key role in integrating ESG factors into financial solutions (Todorov, Aleksandrova, & Ismailov, 2023).

The study aims to analyse the relationship between CSR activities and the performance of the largest companies in Kazakhstan, which are included in Index KASE (Kazakhstan Stock Exchange) list.

MATERIALS AND METHODS
The materials for writing this article were primary data obtained through a review of domestic and international scientific literature on corporate social responsibility (CSR) in business. An important component of the information base for this research included international standards, codes, and regulations related to CSR. Primary sources of information consisted of annual financial reports and CSR reports of companies in Kazakhstan, which were obtained from official company websites. Secondary sources included financial data and indices from the Kazakhstan Stock Exchange (KASE). The data collection period for companies in Kazakhstan spanned from 2009 to 2020.

The article employed a combination of general scientific and specific economic research methods, with a foundation based on the dialectical methodological approach to understanding socio-economic phenomena and processes. A monographic research method was used to identify key trends in the development of corporate social responsibility in modern companies. A review of scientific literature was conducted using the abstract
systematization method, which helped identify key trends and drivers characterizing the development of business social responsibility.

The statistical method, economic-statistical analysis, and analytical monitoring of financial data were used to assess the current state of economic development in leading Kazakh companies and to evaluate their level of corporate social responsibility. In particular, the linear regression method was employed to identify trends and dependencies between financial indicators of company development, expressed through the formula: \( y = aX + b \), where \( aX \) represents the factor coefficient of the regression equation, and \( y \) represents the outcome variable. The index method was used to assess the growth rates of financial indicators for Kazakh companies (such as asset size, equity, and net income) using the following statistical formula:

\[ T = \frac{a_1}{a_0} \times 100 \]

where \( T \) represents the growth rate of the financial indicator, \( a_1 \) is the value of the financial indicator in the reporting period, and \( a_0 \) is the value of the financial indicator in the base period.

Financial analysis methods were applied to calculate liquidity and profitability indicators of selected companies. Analytical observation, monitoring, and comparison formed the basis of the research on the CSR programs of chosen companies. Conclusions from the research were formulated using methods such as abstract concretization, generalization, structural-genetic analysis, and synthesis of the results obtained.

The combination of these methods was complemented by a graphical method to visualize the results of scientific research. Investment inflows, one of the main drivers of economic growth in Kazakhstan, were among the most significant in the former Eastern region. The active development of the oil and gas, chemical, and mining and metallurgy sectors was accompanied by the implementation of corporate social responsibility practices in major companies in the Republic. According to the United Nations, 18 companies officially represent the Republic of Kazakhstan as participants in the global platform for corporate social responsibility and sustainable development (Table 1).

<table>
<thead>
<tr>
<th>Name</th>
<th>Company Size</th>
<th>Field of Activity</th>
<th>Joining</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSC &quot;Microfinance Company &quot;OnlineKazFinance&quot;</td>
<td>Large Business</td>
<td>Finance and Credit Services</td>
<td>2023</td>
</tr>
<tr>
<td>First Heartland Jusan Bank JSC</td>
<td>Large Business</td>
<td>Banking Services</td>
<td>2023</td>
</tr>
<tr>
<td>Central Asian Institute of Ecological Research</td>
<td>Small and Medium Business</td>
<td>Diversified Activities</td>
<td>2023</td>
</tr>
<tr>
<td>JSC HALYK BANK</td>
<td>Large Business</td>
<td>Banking Services</td>
<td>2023</td>
</tr>
<tr>
<td>JSC AK Altnaalmas</td>
<td>Large Business</td>
<td>Mining and Industry</td>
<td>2022</td>
</tr>
<tr>
<td>Karachaganak Green Energy Corporation</td>
<td>Small and Medium Business</td>
<td>Alternative Energy</td>
<td>2022</td>
</tr>
<tr>
<td>Terra Space LLP</td>
<td>Small and Medium Business</td>
<td>Industrial Engineering</td>
<td>2022</td>
</tr>
<tr>
<td>GPI-Lab LLP</td>
<td>Small and Medium Business</td>
<td>Diversified Activities</td>
<td>2022</td>
</tr>
<tr>
<td>Mediker LLP</td>
<td>Large Business</td>
<td>Medical Equipment and Services</td>
<td>2022</td>
</tr>
<tr>
<td>NAC Kazatomprom JSC</td>
<td>Large Business</td>
<td>Mining and Industry</td>
<td>2022</td>
</tr>
<tr>
<td>SAP Kazakhstan</td>
<td>Small and Medium Business</td>
<td>Software and Computer Services</td>
<td>2019</td>
</tr>
<tr>
<td>KDL OLYMP LLP</td>
<td>Large Business</td>
<td>Medical Equipment and Services</td>
<td>2018</td>
</tr>
</tbody>
</table>
The mentioned companies have committed to adhering to the 10 fundamental principles of the UN Global Compact, which are foundational for corporate social responsibility in business. These principles include respecting human rights, eliminating discrimination in labour practices, recognizing the rights of personnel to engage in collective bargaining with business administration, eradicating child labour, actively engaging in voluntary initiatives for environmental protection and the dissemination of safe technologies, and combating corruption.

Corporate social responsibility in the contemporary management practices of Kazakhstani companies is gradually taking on a stable character with clear manifestations. Large businesses now clearly understand that efforts directed towards establishing socially responsible behaviour bring benefits both in the short term and from a strategic perspective (Mikhno et al., 2022). The positive impact on society and the natural environment creates significant potential for influencing customers and improving the financial performance of business activities.

Research conducted based on the analysis of annual financial reports and sustainability reports of the largest companies listed in Forbes demonstrates the increased activity of large businesses in Kazakhstan in the realm of corporate social responsibility and the diversity of its programs. The primary categories of corporate social responsibility programs implemented by companies include the following:

1) Environmental programs and initiatives aimed at the protection and preservation of natural resources and the environment.

2) Initiatives focused on employee development and ensuring safe working conditions.

3) Initiatives related to the production and promotion of high-quality and safe products.

4) Sponsorship programs and philanthropic responsibilities towards local communities and regions.

The average exchange rate of the US dollar to the Kazakhstani tenge in 2020 was 412.95.

Currently, large businesses in Kazakhstan demonstrate a stable practice of implementing corporate social responsibility programs that contribute to the achievement of business development goals. Financial indicators, such as revenue and profit, are no longer the sole determining factors of a company's success in the market. Alongside these, the importance of business and brand value indicators, which are directly linked to the image and reputation capital of enterprises, is growing. Improvement in the value of these indicators is possible
through the presence of socially responsible business initiatives implemented within corporate social responsibility programs and projects. Stakeholders and customers pay great attention to a business’s behaviour and its approach to addressing important social, economic, and environmental issues. Gaining the loyalty of partners and customers in the long term becomes a necessary factor and condition for the long-term successful development and existence of a company. The creation of shared public and corporate values increases the number of customers, clients, sales volumes, and enhances the financial performance of the business.

Research into the financial reporting and corporate social responsibility practices of large businesses in Kazakhstan has allowed the identification of several key advantages that socially responsible initiatives offer: 1) opportunities for additional income and profit generation by creating a positive, sustainable business image in regions, national, and international markets; 2) improving the image and increasing the value of the reputation capital of companies; 3) increasing the level of investment attractiveness for domestic and foreign investors.

Large businesses have significantly greater financial potential to participate in corporate social responsibility projects compared to medium and small-sized companies. However, the scale and cost of socially responsible initiatives often act as a deterrent for small and medium-sized businesses. The priority of short-term profit remains one of the main focuses for small companies. Many managers of small businesses in Kazakhstan believe that corporate social responsibility brings benefits only in the long term and is not financially profitable. Nevertheless, socially responsible initiatives can yield significant results in the current period and do not necessarily entail significant additional costs. For example, energy efficiency environmental programs can have a powerful effect on resource cost savings, waste management programs can lead to material cost savings and employee development programs are characterized by a significant effect on labour productivity and employee initiative even during their implementation ((Table 2).

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Kaz Minerals</th>
<th>Kazakh Communal Systems</th>
<th>Kazakhmys Corporation</th>
<th>Kazchrome</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>million USD</td>
<td>million KZT</td>
<td>million USD</td>
<td>million KZT</td>
</tr>
<tr>
<td>Revenue</td>
<td>2355</td>
<td>972497</td>
<td>347,4</td>
<td>143467,7</td>
</tr>
<tr>
<td>Assets</td>
<td>6889</td>
<td>2844812</td>
<td>817,1</td>
<td>337442,4</td>
</tr>
<tr>
<td>Net Profit</td>
<td>650</td>
<td>20647,5</td>
<td>47,8</td>
<td>19764,6</td>
</tr>
<tr>
<td>EBITDA margin</td>
<td>60,8</td>
<td>590931</td>
<td>106,3</td>
<td>43900,0</td>
</tr>
<tr>
<td>EBITDA</td>
<td>1431</td>
<td>590931</td>
<td>106,3</td>
<td>43900,0</td>
</tr>
<tr>
<td>Current Ratio (CR)</td>
<td>2,61</td>
<td>0,52</td>
<td>1,35</td>
<td>1,88</td>
</tr>
<tr>
<td>Quick Ratio (QR)</td>
<td>1,9</td>
<td>0,43</td>
<td>0,77</td>
<td>1,07</td>
</tr>
<tr>
<td>Absolute Liquidity Ratio</td>
<td>1,01</td>
<td>0,08</td>
<td>0,01</td>
<td>0,33</td>
</tr>
<tr>
<td>Accounts Receivable Turnover (RT)</td>
<td>15,2</td>
<td>37,05</td>
<td>16,1</td>
<td>1,09</td>
</tr>
<tr>
<td>Asset Turnover Ratio (ATR)</td>
<td>0,34</td>
<td>0,42</td>
<td>0,85</td>
<td>0,58</td>
</tr>
</tbody>
</table>
Return on Assets (ROA), %  9,4  5,9  11,1  0,12  
Return on Sales (ROS), %  27,6  13,8  13,1  20,7  
Return on Equity (ROE), %  28,3  11,5  28,8  75,8  
Return on Net Assets (RONA), %  22,0  8,9  28,6  113,3  

Source: developed by the authors on the basis of Kazakhstan Stock Exchange JSC (2023).

The average exchange rate of the US dollar to the national currency (Tenge) for the year 2020 was 1:412.95.

In order to identify the main factors influencing the key financial performance indicators of business activity, the authors collected and analyzed stock market data for the largest participants in quarterly trading for the years 2009–2020. The source of the data was the largest stock exchange in Kazakhstan, KASE. From the pool of all companies, those with the most stable financial results, regular participation in stock trading, and transparency in corporate policy regarding the disclosure of public information to stakeholders were selected. To illustrate the results, the statistical sample included companies from various economic sectors. Among such companies, the following were chosen: "Kcell" is the leading mobile network operator in Kazakhstan; "Halyk Bank," a diversified financial institution; "KazTransOil" JSC, a company engaged in oil transit; VSS Commercial Bank; the innovative online trading services company "Kaspi," "Kaztelecom" JSC, the national telecommunications company; and "KEGOC" JSC, an energy company.

The conducted research has shown that in modern business conditions, the correlation between the size and impact on traditional financial performance indicators, such as the company's assets and equity, is diminishing. The size of the raised funds no longer plays a leading role in generating business income. In contemporary business conditions, revenue is a fairly volatile, flexible, and sensitive indicator, and non-financial factors are beginning to exert a significant influence on it. For example, regression analysis revealed a rather weak relationship between the size of net income and the asset value of the selected companies. Similarly, the correlation between the size of net income and the equity size of business investors was found to be relatively weak. These results suggest that, at present, revenue is influenced to a certain extent by non-financial factors. Excluding the direct influence of sales volumes and the impact of pricing factors, which are always the main indicators of income size, it is considered possible that the influence of the level of business activity in the practice of corporate social responsibility on the process of forming companies' net income will increase (Table 3).

Table 3. Assessment of the degree of dependence of financial indicators on the capital cost of the enterprise (period 2007-2020).

<table>
<thead>
<tr>
<th>Companies and areas of CSR</th>
<th>Ratio of the rate of change in the value of assets and capital to the increase in net income</th>
<th>Degree of dependence of net revenue on assets</th>
<th>Degree of dependence of net revenue on equity capital</th>
<th>Degree of dependence of the KASE index on net revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kcell</td>
<td>Assets = 156.6%</td>
<td>$R^2=0.56$</td>
<td>$R^2=0.44$</td>
<td>$R^2=0.15$</td>
</tr>
</tbody>
</table>
More than 40 social programs: education, sports, support for people with disabilities, preservation of the cultural heritage of the region. The amount of social investment is $6 million per year

<table>
<thead>
<tr>
<th>Company</th>
<th>Social Programs</th>
<th>Capital</th>
<th>Net income</th>
<th>Y = aX + b</th>
<th>R² = 0.94</th>
<th>Y = aX + b</th>
<th>R² = 0.96</th>
<th>Y = aX + b</th>
<th>R² = 0.94</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halyk Bank</td>
<td>Education, healthcare, education, support for culture, art, mass and professional sports, environmental protection and care for children without parental care</td>
<td>84.0%</td>
<td>41.5%</td>
<td>-0.8X + 1.7</td>
<td>0.04X - 3.1</td>
<td>-0.8X - 3.6</td>
<td>0.3X + 12.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KazTransOil</td>
<td>Adoption of the CSR Code, natural resource conservation programs, environmental neutrality, energy efficiency, human rights protection, personnel development</td>
<td>624%</td>
<td>785%</td>
<td>-0.8X + 2.2</td>
<td>0.14X - 2.6</td>
<td>-0.8X + 2.2</td>
<td>0.16X + 19.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCC</td>
<td>CSR projects: charity, financing the revival of national culture, credit lines for green economy companies, personnel development and labor protection programs</td>
<td>278%</td>
<td>248%</td>
<td>-0.8X + 2.2</td>
<td>0.01X + 99.6</td>
<td>-0.8X + 2.2</td>
<td>0.09X - 31.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaspi</td>
<td>CSR projects: social and financial support for veterans, charity, purchase of equipment for medical institutions for the treatment of Covid</td>
<td>170%</td>
<td>72%</td>
<td>-0.8X + 2.2</td>
<td>0.08X - 3.16</td>
<td>-0.8X + 2.2</td>
<td>0.7X - 3.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kazakhtelecom</td>
<td>CSR projects: environmental protection, energy efficiency, occupational safety and health, anti-fraud and corruption</td>
<td>827%</td>
<td>739%</td>
<td>-0.8X + 2.2</td>
<td>1.14X - 1.6</td>
<td>-0.8X + 2.2</td>
<td>0.2X - 1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEGOC</td>
<td>Creation of new jobs, implementation of social programs for personnel, sponsorship and charity, environmental and educational events, support for sports</td>
<td>458%</td>
<td>1281%</td>
<td>-0.8X + 2.2</td>
<td>0.07X - 1.5</td>
<td>-0.8X + 2.2</td>
<td>0.1X - 1.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: developed by the authors on the basis of Kazakhstan Stock Exchange JSC (2023).

Additionally, the analysis revealed the presence of a relatively weak quantitative relationship between the main indicators of stock market activity of the companies and the size of their net income (KASE index - the primary indicator of the stock market in Kazakhstan).

Such results provide the basis for the hypothesis that indicators of companies' business activity on stock markets today are determined not only by financial indicators of their performance. We consider reputational...
(image) capital to be one of the main factors influencing companies on the value of companies’ index stock positions, the value of which today is largely determined by the level of business participation in solving social development problems: socio-economic, environmental, cultural, regional, that is, the actual level of social business responsibility. The results obtained indirectly confirm this assumption and will serve for further research into the impact of social responsibility of modern business on its key indicators and market ratings.

![Fig. 1. Dynamics of the KASE index of companies Kazakhstan (2009-2020).](image)

Source: developed by the authors on the basis of Kazakhstan Stock Exchange JSC (2023).

The study is devoted to CSR and firms’ performance issues and it is mostly focused on CSR activities and firms’ performance. How does firm performance affect CSR activities in Kazakhstan? The paper strives to find a correlation between performance and CSR activities of the firm. The motivation behind it is to conduct this study in a developing country, which is more vulnerable to any external shocks. Businesses in emerging economies face numerous problems in their projects and probably, CSR activities are needed to improve their image. The research employs quarterly data obtained from Bloomberg Finance (2023) and the Kazakhstan Stock Exchange (2023). The sample employs eight largest corporations in Kazakhstan. The period studied is Q1-2010 through Q1-2020, which employs 44 quarters. Several financial ratios and accounting profitability were taken into account when measuring profitability. In scientific research classic financial indicators such as return on equity, return on assets, as well as surplus-value were used.

CSR is measured by Moskowitz’s (1972, 1975) tripartite ratings (‘outstanding’, ‘honorable mentioned’, and ‘worst’ companies). For example, Sturdivant and Ginter (1977) employed Moskowitz’s categories in their studies. Moskowitz’s categories data for Kazakhstani companies were hand-collected from annual audited reports from January 2010 – December 2020. The panel least squares technique was employed in the study. The main model is demonstrated below:
\[
CSR = a_0 + a_1 \text{ROA}_{t-1} + a_2 \text{ROE}_{t-1} + a_3 \text{MV}_{t-1} + a_4 \text{NPM}_{t-1} + \varepsilon
\]  

(1)

Where: ROA – Return on assets; ROE – Return on equity; MV-Market value; NPM-Net profit margin.

In this model, prior financial performance is employed in the research because the higher the company's financial performance, the more it can be active, effective, and mobile in socially responsible practices. ROA and ROE are classical variables in finance, which demonstrate Return on Assets and Return on Equity. Both are measures of profitability and efficiency. Greater profitability and greater efficiency may improve CSR practices. Only profitable businesses may actively engage in CSR projects. NPM stands for Net Profit Margin.

Table 4 below demonstrates descriptive statistics parameters for all the variables studied. The table demonstrates such parameters as mean, median, and IQR.

<table>
<thead>
<tr>
<th>Code</th>
<th>Company</th>
<th>Last price, KZT</th>
<th>Weight, %</th>
<th>Shares, pcs</th>
<th>Fi, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSBK</td>
<td>Halyk Bank</td>
<td>125.88</td>
<td>15.3</td>
<td>10 908 249 222</td>
<td>30.5</td>
</tr>
<tr>
<td>KSPI</td>
<td>Kaspi.kz</td>
<td>34 050.00</td>
<td>15.2</td>
<td>190 309 970</td>
<td>23.3</td>
</tr>
<tr>
<td>KCEL</td>
<td>Kcell</td>
<td>1 774.86</td>
<td>15.2</td>
<td>200 000 000</td>
<td>34.1</td>
</tr>
<tr>
<td>KMGZ</td>
<td>KazMunayGas</td>
<td>9 560.02</td>
<td>15.0</td>
<td>610 119 493</td>
<td>3.0</td>
</tr>
<tr>
<td>KZAP</td>
<td>Kazatomprom</td>
<td>13 420.00</td>
<td>14.1</td>
<td>259 356 608</td>
<td>25.0</td>
</tr>
<tr>
<td>KZTK</td>
<td>Kazakhtelecom</td>
<td>29 592.00</td>
<td>7.5</td>
<td>10 338 514</td>
<td>16.3</td>
</tr>
<tr>
<td>CCBN</td>
<td>Bank Center Credit</td>
<td>631.30</td>
<td>7.2</td>
<td>188 029 035</td>
<td>40.4</td>
</tr>
<tr>
<td>KEGC</td>
<td>KEGOC</td>
<td>1 618.70</td>
<td>6.3</td>
<td>259 998 191</td>
<td>10.0</td>
</tr>
<tr>
<td>KZTO</td>
<td>Kaztransoil</td>
<td>717.00</td>
<td>4.1</td>
<td>384 618 364</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Source: developed by the authors on the basis of Kazakhstan Stock Exchange JSC (2023).

Figure 2 demonstrates Index KASE behaviour from 2001 till 2022.

NPM is an indicator of net profit margin; it is the percentage of profit that a business receives for each monetary unit earned. Unlike the net profit indicator, the return on sales is calculated as a percentage, which makes it easier to analyse financial performance. These metrics are a measure of profitability and efficiency. Higher profitability and greater efficiency can improve CSR practices. Only profitable enterprises can actively participate in CSR projects. Profitability ratios are useful from the point of view of both absolute value and dynamics. Analysis of dynamics allows us to highlight the nature of changes in the profitability of an enterprise.
and determine the direction of movement. Figures 3-5 below show the dynamics of the ROA, ROE and NPM coefficients for leading enterprises in Kazakhstan. Trends are downward and unstable.

But in general, the coefficients are positive, with the exception of 2010, 2011 and 2012, which shows that enterprises are competitive and attractive to investors.

![KASE index](image1.png)

**Fig. 2.** KASE index (2001 -2022) of the most liquid shares of resident companies of the Republic of Kazakhstan.

*Source: developed by the authors on the basis of Kazakhstan Stock Exchange JSC (2023).*

![ROA graph](image2.png)

**Fig. 3.** ROA - Return on assets of leading enterprises in Kazakhstan.

*Source: developed by the authors on the basis of Kazakhstan Stock Exchange JSC (2023).*
Fig. 4. ROE - Return on equity of leading enterprises in Kazakhstan.
*Source: developed by the authors on the basis of Kazakhstan Stock Exchange JSC (2023).*

Fig. 5. NPM - Net Profit Margin of leading enterprises in Kazakhstan.
*Source: developed by the authors on the basis of Kazakhstan Stock Exchange JSC (2023).*

Table 5 presents descriptive statistics for all study variables. The goal of descriptive statistics is to use mathematical tools to reduce hundreds of sample values to a few summary measures that provide insight into the sample. The following statistical indicators are used: mean, median, dispersion, standard deviation.

The table below provides summary statistics of data for the 1st quarter of 2010–4th quarter of 2020. Return on assets is the ratio of net profit to average assets. The asset variable is measured by the natural logarithm of total assets. Return on equity is the ratio of net income to equity. Net profit margin is the ratio of net profit to sales. The reliability level is 95%.
Table 5. Descriptive Statistics (Kazakhstan data).

<table>
<thead>
<tr>
<th></th>
<th>Kcell</th>
<th>Halyk Bank</th>
<th>KazTra nsOil</th>
<th>BCC</th>
<th>Kaspi</th>
<th>Kazakh telecom</th>
<th>Kazatprom</th>
<th>KEG OC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ROA – Return on Assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>0.257</td>
<td>0.032</td>
<td>0.083</td>
<td>0.003</td>
<td>0.042</td>
<td>0.112</td>
<td>0.125</td>
<td>0.033</td>
</tr>
<tr>
<td>Standard error</td>
<td>0.025</td>
<td>0.002</td>
<td>0.004</td>
<td>0.001</td>
<td>0.005</td>
<td>0.017</td>
<td>0.013</td>
<td>0.004</td>
</tr>
<tr>
<td>Median</td>
<td>0.320</td>
<td>0.033</td>
<td>0.090</td>
<td>0.002</td>
<td>0.044</td>
<td>0.072</td>
<td>0.128</td>
<td>0.039</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.167</td>
<td>0.011</td>
<td>0.024</td>
<td>0.006</td>
<td>0.032</td>
<td>0.114</td>
<td>0.086</td>
<td>0.027</td>
</tr>
<tr>
<td>Sample variance</td>
<td>0.028</td>
<td>0.000</td>
<td>0.001</td>
<td>0.000</td>
<td>0.001</td>
<td>0.013</td>
<td>0.007</td>
<td>0.001</td>
</tr>
<tr>
<td>Interval</td>
<td>0.430</td>
<td>0.041</td>
<td>0.099</td>
<td>0.047</td>
<td>0.105</td>
<td>0.512</td>
<td>0.418</td>
<td>0.125</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.049</td>
<td>0.008</td>
<td>0.048</td>
<td>-0.026</td>
<td>0.001</td>
<td>0.016</td>
<td>0.024</td>
<td>-0.056</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.480</td>
<td>0.049</td>
<td>0.148</td>
<td>0.021</td>
<td>0.106</td>
<td>0.528</td>
<td>0.442</td>
<td>0.069</td>
</tr>
<tr>
<td>Reliability level(95.0%)</td>
<td>0.051</td>
<td>0.003</td>
<td>0.007</td>
<td>0.002</td>
<td>0.010</td>
<td>0.035</td>
<td>0.026</td>
<td>0.008</td>
</tr>
</tbody>
</table>

| **ROE – Return on equity** |       |            |              |     |       |                |           |        |
| Average              | 0.257 | 0.032      | 0.083        | 0.003 | 0.042 | 0.112          | 0.125     | 0.033  |
| Standard error       | 0.025 | 0.002      | 0.004        | 0.001 | 0.005 | 0.017          | 0.013     | 0.004  |
| Median               | 0.320 | 0.033      | 0.090        | 0.002 | 0.044 | 0.072          | 0.128     | 0.039  |
| Standard deviation   | 0.167 | 0.011      | 0.024        | 0.006 | 0.032 | 0.114          | 0.086     | 0.027  |
| Sample variance      | 0.028 | 0.000      | 0.001        | 0.000 | 0.001 | 0.013          | 0.007     | 0.001  |
| Interval             | 0.430 | 0.041      | 0.099        | 0.047 | 0.105 | 0.512          | 0.418     | 0.125  |
| Minimum              | 0.049 | 0.008      | 0.048        | -0.026 | 0.001 | 0.016          | 0.024     | -0.056 |
| Maximum              | 0.480 | 0.049      | 0.148        | 0.021 | 0.106 | 0.528          | 0.442     | 0.069  |
| Reliability level(95.0%) | 0.051 | 0.003      | 0.007        | 0.002 | 0.010 | 0.035          | 0.026     | 0.008  |

| **NPM - Net Profit Margin** |       |            |              |     |       |                |           |        |
| Average              | 0.251 | 0.093      | 0.053        | 0.013 | 0.082 | 0.123          | 0.127     | 0.039  |
| Standard error       | 0.023 | 0.001      | 0.001        | 0.000 | 0.002 | 0.017          | 0.009     | 0.003  |
| Median               | 0.310 | 0.095      | 0.050        | 0.015 | 0.081 | 0.083          | 0.115     | 0.038  |
| Standard deviation   | 0.152 | 0.005      | 0.007        | 0.003 | 0.013 | 0.112          | 0.057     | 0.021  |
| Sample variance      | 0.023 | 0.000      | 0.000        | 0.000 | 0.000 | 0.013          | 0.003     | 0.000  |
| Interval             | 0.380 | 0.019      | 0.020        | 0.010 | 0.050 | 0.500          | 0.231     | 0.063  |
| Minimum              | 0.050 | 0.080      | 0.040        | 0.010 | 0.050 | 0.030          | 0.059     | 0.010  |
| Maximum              | 0.430 | 0.099      | 0.060        | 0.020 | 0.100 | 0.530          | 0.290     | 0.073  |
| Reliability level(95.0%) | 0.046 | 0.002      | 0.002        | 0.001 | 0.004 | 0.034          | 0.017     | 0.006  |

Source: developed by the authors on the basis of Kazakhstan Stock Exchange JSC (2023).

The correlation matrix (Table 6) shows the correlation coefficients between the variables.

The table shows that the correlation between all the studied variables is low. Some relationships are negative. It can be interpreted that all the variables studied are not significantly correlated, which means that there is no problem of multicollinearity.

Based on this fact, we can assume that all variables can be easily studied and used in one regression model.
RESULTS AND DISCUSSION

The extended Dickey-Fuller unit root test was used as a prelude to the regression analysis. The results show that there is a unit root at the first level. The data was logged and varied in some cases to eliminate the unit root problem.

Today, the most popular statistical test in statistical research is t-tests. T-test It is also called paired Student's T-test, t-test, two-sample unpaired t-test.

It is worth noting that the results of statistical tests and their interpretation in general do not indicate an exact “yes” or “no” in the conclusion, that is, growth is different, or growth is not different. It is always a matter of a certain degree of probability - the degree of probability of being mistaken when stating a positive result.

Table 7 presents the relationship between CSR activities and profitability indicators for companies in Kazakhstan. The results show the T-test in parentheses.

Table 7. CSR and hard performance indicators (data from Kazakhstan).

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Coefficients</th>
<th>t-statistic</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5%*</td>
<td>1%**</td>
<td>5%*</td>
</tr>
<tr>
<td>ROA t-1</td>
<td>0.061</td>
<td>0.069</td>
<td>1.821</td>
</tr>
<tr>
<td>ROE t-1</td>
<td>0.052</td>
<td>0.059</td>
<td>2.932</td>
</tr>
<tr>
<td>NPM</td>
<td>0.451</td>
<td>0.049</td>
<td>2.523</td>
</tr>
<tr>
<td>MV</td>
<td>0.002</td>
<td>0.002</td>
<td>2.182</td>
</tr>
<tr>
<td>Scaled R squared</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The research results presented show the correlations between previous financial and accounting indicators and CSR. Correlations between the variables used are presented. The results indicate that ROA and ROE do not influence CSR in Kazakhstan. However, there is a relationship between CSR and NPM in Kazakhstan. Various confidence intervals were used and demonstrated. The model and its applicability were explained in detail earlier. Classic indicators of efficiency are ROA and ROE, which do not correlate with CSR in Kazakhstan. However, NPM is strongly correlated with CSR practices in Kazakhstan. Profitable companies practice CSR in Kazakhstan.
The practice of CSR is influenced by the performance results of companies in Kazakhstan. Kazakhstani companies demonstrate a correlation between CSR practices and NPM, which is an indicator of profitability. Kazakhstani companies have a link between CSR practices and firm efficiency, but it occurs only through net profit margin. CSR practices in Kazakhstan are of interest only to profitable (high NPM) businesses. The results are interesting and unique due to the emerging post-Soviet economy. This is an innovative study that opens up new opportunities for further research.

CONCLUSION
Kazakh companies are increasing their expenses related to improving their ESG rating, clearly understanding the relationship between factors, reliability, and the prospects of gaining a competitive advantage. Improving the company's business reputation and increasing and qualitatively improving the human capital of employees leads to the growth of the company's financial position. Expenses for improving the ESG rating should not be limited to the implementation of environmentally friendly production technologies, rational use of natural resources, and environmental pollution reduction, but also expanded through reputational improvements in its relationships with stakeholders in the fields of ecology, social sphere, corporate governance, and public reporting on this activity. "ESG company rating—financial success" as a practice aimed at increasing the ESG rating contributes to the accumulation of intellectual capital, which provides a competitive advantage.

ESG strategy is dynamically developing, forming responsible investment, and reflecting the desire of investors to invest only in instruments of issuers with a high ESG rating. However, there are significant risks to trust in ESG company reports, which can lead to the presentation of unjustified profitability of shares with high ESG ratings (of which there are many, but they are largely incomparable, immaterial, and unstable). It is difficult to calculate the business reputation of a company and the quality of human resource management, even in the short term.

Further research is needed on the relationship between "responsibility level (ESG rating) and financial performance and investment efficiency" in the context of actual changes in the business model, regional and global risks, the development of a clear, unified methodology, and a list of mandatory criteria for assessing the situation when companies that do not meet investors' ESG expectations lose capitalization and increase the risk of losing access to capital markets.

The results of the study are consistent with the theory and confirm the fact that CSR practices and firm performance are correlated. The association between CSR activities and financial performance was tested, and the results show that there is a positive correlation among those variables studied in Kazakhstan. The limitation of the research is the fact that only 8 firms were studied. Another limitation of this research is that only a short period was studied. The study employed only a ten-year period. The problem with a small sample is due to the fact that the data is unavailable in Kazakhstan.

The possibility and implications of additional explanatory variables must be explored. To avoid the problems of accounting-based and financial measures, it would be better to use only stock-market-based
measures of performance. Therefore, further research may employ market indicators such as stock prices or stock market indexes in their study.

Further research may also employ new techniques such as the Granger causality method, which analyzes the influence on both dimensions such as CSR and profitability. Such variables as retained earnings may be added. Probably, retained earnings play a crucial role in this matter as well. It should be noted and studied further. Comparative analysis of developing and developed countries may be employed as well. The study may take place in any developing or emerging country as well as in a developed one. Moreover, a qualitative approach may be performed as well as a quantitative technique. In-depth interviews, questionnaires, and other qualitative approaches may be employed as well. The topic is a promising avenue for further research. The topic is interesting for academicians as well as for business people.

CSR activities are essentially important in emerging economies because they are focused on society. The more they earn, the more they engage in CSR practices. The financial performance of a firm and CSR practices are positively correlated in Kazakhstan. It should be taken into consideration as well.

In addition, it should be noted that Kazakhstan is an emerging country and that it differs from developed markets in managerial, cultural, ethical, and social practices.

In our opinion, we should not forget about the peculiar effects of the implementation of socially responsible policy in a particular enterprise. The latter will manifest itself in creating a positive image, improving the reputation, and establishing effective interaction with target audiences. At the same time, it should be noted that the process of forming a positive image based on corporate social responsibility is a systemic process that requires significant financial resources, but the benefits that the company receives as a result are quite significant. Thus, in particular, when investing in the social development of staff, the company ensures the recruitment and retention of highly qualified personnel, increases productivity, increases sales, and maximizes profits. In summary, we note that corporate social responsibility is focused on the future, and the funds that the company spends on it will return only later, but in an increased amount (Lipovka et al, 2021; Aslanzade, 2021).

The social responsibility of enterprises in Kazakhstan should be considered in two aspects: as a necessary cost item and as strategic reputational investments that contribute to the creation of a more sustainable global world and positively correlate with the financial position of the company.


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**Conflict of interests**

The authors declare no conflict of interest.

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ARTIFICIAL INTELLIGENCE IN CLIMATE SMART IN AGRICULTURAL: TOWARD A SUSTAINABLE FARMING FUTURE

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ABSTRACT
This paper explores the connections between artificial intelligence and climate smart agricultural change research as a whole and its usefulness in adaptation efforts in smart agricultural technologies. In article increased attention is currently being paid to the use of smart technologies. The article provides an analysis of the prospects for the use of artificial intelligence technologies and Climate-Smart Agriculture. At the preparatory stage, an analysis of publications in the Woof network was carried out, which allows specifying the essence and scope of artificial intelligence technologies in smart climate agriculture. The authors considered divided into four important components which include: the management of crops, farms, livestock and aquaculture to achieve a near-term balance in food security and livelihoods; the management of landscapes and ecosystems to reserve ecosystem services that are critical for agricultural development, food security, adaptation, and mitigation; enable better farm and land management by providing services on climate impacts and mitigation actions to managers of these resources; enhancing the desirable benefits of Climate-Smart Agriculture through demand-side measures and value chain interventions. Accordingly, Climate-Smart Agriculture and artificial intelligence aims to achieve the objectives of increasing productivity and incomes sustainably, making agriculture adaptive to the changing climate, and where possible cost-effective.

Keywords: Sustainability, artificial intelligence, climate smart in agricultural, machine learning, artificial intelligence technologies
JEL classification: Q10; O10; Q01
Paper type: Research article

INTRODUCTION
Artificial Intelligence (AI) is believed to have a significant potential use in tackled climate change. Agriculture is the oldest and most dynamic occupation throughout the world (Eli-Chukwu, 2019; Kaur & Sidhu, 2020; Marco et al., 2021).

According to experts (Matyushenko et al., 2020; Gryshova et al., 2019; Nassivera et al., 2017; Bao & Xie, 2022; Kurgat et al., 2020; Ma et al., 2022; Delcheva, Nencheva & Penev, 2021; Lazarova et al., 2023; Zagorodnya, Chernukha & Petrova, 2020; Todorov, Aleksandrova & Ismailov, 2023) since the population of
world is always increasing and land is becoming rare, there evolves an urgent need for the entire society to think inventive and to find new affective solutions to farm.

The importance of addressing climate change in agriculture cannot be overstated. Agriculture is inherently dependent on favorable climatic conditions, including temperature, precipitation, and sunlight, for optimal crop growth and livestock production. However, climate change is causing shifts in these conditions, leading to increased variability, extreme weather events, and long-term changes in temperature and rainfall patterns. These changes pose significant challenges and risks to agricultural systems worldwide. (Gulzar, Abbas & Waqas, 2020; Klerkx, Jakku, Labarthe, 2019; Marco et al., 2021; Subeesh & Mehta, 2021)

Agriculture is the primary source of food for the growing global population. Climate change threatens food security by disrupting crop yields, reducing the availability of water for irrigation, and increasing the prevalence of pests and diseases (Krastanova et al., 2022). Adapting agricultural practices to climate change is crucial to ensure a stable and sufficient food supply for current and future generations (Ma et al., 2022; 2021; Vijayakumar & Balakrishnan, 2021).

The livelihoods of millions of farmers depend on agricultural activities. Climate change-induced events such as droughts, floods, and heatwaves can have devastating effects on crop yields, livestock productivity, and farm incomes. Addressing climate change in agriculture is essential for preserving rural livelihoods, reducing poverty, and ensuring sustainable rural development. (Veroustraete, 2015; Wang, Wang & Zhang, 2019)

Agriculture is intricately connected to the environment. Unsustainable agricultural practices contribute to greenhouse gas emissions, deforestation, soil degradation, and water pollution. By adopting climate-smart agricultural practices, such as conservation agriculture, agroforestry, and precision farming, we can mitigate the environmental impact of agriculture and promote sustainable land and resource management (Ma et al., 2022; Toleuuly et al, 2020; Tielkiniena et al., 2020).

**LITERATURE REVIEW**

Agricultural ecosystems are home to diverse flora and fauna and provide various ecosystem services. Climate change affects biodiversity by altering habitats, disrupting pollination patterns, and increasing the risk of invasive species. Sustainable farming practices that consider climate change can help preserve biodiversity, protect ecosystem services, and maintain the resilience of agricultural landscapes (Marco et al., 2021; Ma et al., 2022; Tielkiniena et al., 2020).

Climate change is characterized by increased variability and uncertainty. By addressing climate change in agriculture, farmers can enhance their resilience to climate-related risks. Adaptation measures, such as utilizing drought-tolerant crop varieties, implementing efficient irrigation systems, and adopting climate-smart technologies, can help farmers cope with changing conditions and minimize production losses (Wang, Wang & Zhang, 2019).
Agriculture is a significant contributor to greenhouse gas emissions, primarily through methane from livestock and nitrous oxide from fertilizers. By adopting climate-smart practices, such as improved nutrient management, precision fertilization, and methane capture technologies, agriculture can contribute to mitigating climate change by reducing emissions and enhancing carbon sequestration in soils (Eli-Chukwu, 2019).

Climate-Smart Agriculture (CSA) is an approach to transform and reorient agricultural production systems and value chains to support sustainable development and food security in the face of climate change. CSA is a set of practices that should be adapted and applied within a specific approach that includes various elements built into specific contexts and adapted to meet local needs. To enhance food security in the face of climate change, we will need agriculture systems that are more productive, use inputs more efficiently, and are more resilient to a wide and growing range of risks. (Yessengeldin et al, 2019; Ma et al., 2022; Wang, Wang & Zhang, 2019; Ramazanov & Petrova, 2020).

This will mean changing the way land, soil, water, and other inputs are managed. But because agriculture varies from place to place, and climate change will impact each location differently, climate-smart agriculture needs to respond to local conditions. It is not a one-size-fits-all approach to agriculture, but rather a framework to be applied and adapted – a paradigm shifts in thinking and action. Agriculture is now turning to artificial intelligence (AI) have been employed in agriculture over a long period of time, alongside other advanced computing technologies.

Climate smart agriculture (CSA) which involves the integration of Artificial Intelligence (AI) –this emerging agricultural paradigm that is foreseen to be the main driver of agriculture as the Artificial Intelligence (AI) is believed to have a significant potential use in tackling climate change. This paper explores the connections between AI and climate smart agricultural change research as a whole and its usefulness in adaptation efforts in smart agricultural technologies (Eli-Chukwu, 2019; Gulzar, Abbas & Waqas, 2020; Klerkx, Jakku & Labarthe, 2019).

Climate-Smart Agriculture (CSA) is an approach that aims to address the challenges posed by climate change in agriculture while promoting sustainable and resilient farming practices. It combines three key principles: increasing agricultural productivity, enhancing adaptation to climate change, and reducing greenhouse gas emissions. The objectives of Climate-Smart Agriculture are as follows:

The first objective of CSA is to improve and sustain agricultural productivity to meet the growing global food demand. This involves implementing practices that optimize resource use, enhance soil fertility, and promote efficient crop and livestock management techniques. By increasing productivity, CSA aims to ensure food security and support rural livelihoods.

CSA recognizes that climate change is already affecting agricultural systems and aims to enhance their resilience and adaptive capacity. The objective is to help farmers and farming communities cope with the impacts of climate change, such as increased variability in weather patterns, extreme events, and changing
pest and disease dynamics. CSA promotes the adoption of climate-resilient varieties, diversified cropping systems, and improved water management practices.

Agriculture is a significant contributor to greenhouse gas (GHG) emissions, particularly methane (CH4) from livestock and nitrous oxide (N2O) from fertilizers and soil management practices. The objective of CSA is to reduce these emissions by promoting practices that minimize the release of GHGs and enhance carbon sequestration in soils and vegetation. This includes precision nutrient management, agroforestry, conservation agriculture, and the use of renewable energy sources (Klerkx, Jakku & Labarthe, 2019; Veroustraete, 2015).

As rightly noted by B.K. Kurgat (Kurgat et al., 2020), CSA seeks to ensure long-term food security and contribute to sustainable development goals. It aims to improve access to nutritious food, reduce poverty, and promote sustainable rural livelihoods. By promoting sustainable and climate-resilient farming practices, CSA supports economic growth, social well-being, and environmental sustainability.

On the other hand, CSA emphasizes the efficient use of resources such as water, energy, and nutrients to minimize waste and environmental impact. It encourages the adoption of precision farming techniques, water-saving irrigation systems, and integrated nutrient management practices. By optimizing resource use, CSA aims to conserve natural resources and reduce the carbon and water footprints of agriculture.

Knowledge sharing, capacity building, and collaboration among stakeholders are essential components of CSA. It involves the exchange of information, best practices, and technologies to support farmers in implementing climate-smart solutions. CSA encourages partnerships between farmers, researchers, policymakers, and private sector entities to drive innovation, improve access to resources, and scale up climate-smart agricultural practices.

Artificial intelligence (AI) has numerous applications in agriculture and animal farming, ranging from precision management practices to improved monitoring and decision-making. Here are some key applications of AI in agriculture and animal farming:

**AI-powered systems can analyze** images of crops to detect diseases, nutrient deficiencies, and pest infestations. By using computer vision and machine learning algorithms, AI can identify visual patterns associated with crop health issues. This enables farmers to take early action and implement targeted treatments, reducing crop losses and optimizing resource usage.

**AI plays a vital role in precision agriculture**, optimizing resource allocation and improving crop yields. AI algorithms analyze data from multiple sources, including sensors, drones, and satellites, to provide insights into soil conditions, weather patterns, and crop growth. This information helps farmers tailor irrigation, fertilization, and pesticide application to specific areas within a field, minimizing input waste and maximizing productivity (Kaur & Sidhu, 2020).

**AI-powered machinery and robotics automate labor-intensive tasks** in farming and animal management. As rightly noted by Ngozi Clara Eli-Chukwu (Eli-Chukwu, 2019), autonomous equipment can
perform planting, harvesting, and weeding with precision, improving efficiency and reducing the need for manual labor. In animal farming, robots can automate feeding, monitoring, and milking processes, ensuring consistent and optimal care for livestock. AI technologies assist in monitoring the health and welfare of livestock. Sensors and cameras collect data on animal behavior, feed consumption, and health parameters. AI algorithms analyze this data, enabling early detection of health issues, predicting disease outbreaks, and optimizing feeding and breeding practices. This leads to improved animal welfare, increased productivity, and reduced veterinary costs.

**AI can analyze data on animal nutrition**, feed composition, and performance to optimize feed formulation and feeding practices. By considering factors such as animal health, growth stage, and nutrient requirements, AI algorithms can generate customized feed plans. This enhances feed efficiency, minimizes waste, and reduces environmental impacts associated with animal farming.

**AI can contribute** to disease surveillance and outbreak prediction in animal farming. By analyzing data from various sources, including veterinary records, environmental factors, and animal health indicators, AI algorithms can identify patterns and predict disease outbreaks. Early detection and proactive measures enable farmers to implement control strategies, minimizing the spread of diseases and reducing economic losses.

**AI can aid in environmental monitoring**, including soil health assessment, water quality monitoring, and biodiversity monitoring. AI algorithms process data from sensors and other sources to identify environmental risks and optimize resource usage. This promotes sustainable farming practices, reduces environmental impact, and supports the conservation of natural resources (Kurgat et al., 2020).

**AI-powered data analytics tools assist farmers** in making informed decisions. AI algorithms process large volumes of data, including historical records, weather data, and market trends, to provide actionable insights. This helps farmers optimize planting schedules, manage inventory, predict market demand, and make data-driven decisions to improve productivity and profitability (Gulzar, Abbas & Waqas, 2020; Klerkx, Jakku & Labarthe, 2019; Ma et al., 2022; Veroustraete, 2015).

Mitigating climate risks and building resilience are essential in both agriculture and animal farming. Artificial intelligence (AI) offers several applications that contribute to these goals. Here are key applications of AI in agriculture and animal farming for mitigating climate risks and building resilience:

**AI algorithms analyze historical climate data**, satellite imagery, and real-time weather data to develop climate models and predict future climate patterns. These predictions help farmers and animal producers anticipate and plan for climate-related risks, such as extreme weather events, temperature fluctuations, or disease outbreaks. By incorporating AI-generated climate forecasts, stakeholders can make informed decisions about management practices, animal welfare, and adaptation strategies (Eli-Chukwu, 2019).

**AI technologies assist in monitoring and managing** livestock by analyzing data collected from sensors, cameras, and wearable devices. Machine learning algorithms can detect and analyze behavior patterns, health indicators, and environmental conditions. This enables early detection of diseases, distress signals, or
abnormal behavior in animals. By identifying such issues promptly, appropriate actions can be taken to mitigate risks, ensure animal welfare, and prevent the spread of diseases.

**AI algorithms analyze data on animal nutrition.** By considering factors such as animal health, growth stage, and nutrient requirements, AI can generate customized feed plans. This enhances feed efficiency, minimizes waste, and reduces the environmental impact of animal farming. Optimized nutrient management helps mitigate greenhouse gas emissions from livestock and promotes sustainable resource use (Koshkalda et al., 2020).

**AI supports breeding programs** that aim to develop climate-resilient livestock. By analyzing genetic data, environmental conditions, and performance records, AI algorithms can identify genetic markers associated with desirable traits such as heat tolerance, disease resistance, or feed efficiency. This knowledge assists in selective breeding, enhancing the resilience of animal populations to climate-related stresses and reducing vulnerability to climate risks.

**AI technologies can integrate real-time data** on weather, climate, and animal health to develop early warning systems for climate-related risks. By analyzing these data streams, AI algorithms can provide timely alerts and recommendations to farmers and animal producers. This helps them take preventive measures, such as adjusting management practices, sheltering animals, or implementing biosecurity protocols, to mitigate risks and minimize losses (Bao & Xie, 2022; Ma et al., 2022; Tielkiniena et al., 2020).

**AI-powered decision support systems provide farmers** and animal producers with real-time insights and recommendations. By integrating data from multiple sources, including weather forecasts, environmental sensors, and animal health records, AI algorithms assist in making informed decisions related to climate risks and resilience-building strategies. This includes recommendations on adaptive management practices, resource allocation, and risk mitigation measures.

**AI contributes to disease surveillance and control in animal farming.** By analyzing data on disease prevalence, environmental factors, and animal health indicators, AI algorithms can identify patterns and predict disease outbreaks. Early detection allows for prompt response and targeted interventions, such as vaccination, quarantine, or treatment, reducing the spread and impact of diseases on animal populations (Kurgat et al., 2020; Tielkiniena et al., 2020).

**MATERIALS AND METHODS**

Many aspects related to the implementation and use of AI technologies in agriculture economy, theoretically and methodically are not developed. The conceptual apparatus has not been sufficiently developed, and the consequences of using artificial intelligence technologies have been little studied. This explains the choice of topic, object, subject, purpose and objectives of the study. In the course of the study, a bibliometric method was used, which allows collecting information about publications for its further generalization.
In this study, an in-depth scanning texts to select keywords, then analysis of publications in scientometric databases was carried out.

To assess the possibilities of applying technologies AI in agriculture used toolkit SWOT analysis. Universal tricks of this method made it possible to identify strengths and weaknesses, to identify opportunities and threats of application of AI technologies in climate smart in agricultural. We also used the economic-statistical analysis and other methods of scientific research, due to the specific objectives of the study.

**RESULTS**

Currently, climate-oriented agriculture in Ukraine is making the transition to digital technologies. According to BI Intelligence Research forecasts, global spending on smart agricultural technologies and systems, including artificial intelligence and machine learning, will triple by 2025, reaching $15.3 billion.

Artificial intelligence, machine learning and Internet technologies, which provide real-time data for algorithms, significantly increase the efficiency of agricultural enterprises, crop yields and reduce food production costs. According to UN analytics, by 2050 the world's population will increase by another 2 billion people. This requires a 60% increase in food production. According to the Economic Research Service of the United States Department of Agriculture, the cultivation, processing and logistics of food in the country is valued at $1.7 trillion. Artificial intelligence and machine learning just show the potential to help meet the expected food needs in 20-30 years.

Imagine that in a large agricultural holding on an area of several tens of thousands of hectares, there are at least 40 main processes that need to be monitored, improved and controlled at the same time. Understanding how weather, seasonal rainfall, bird and insect migration, fertilizer use for various crops, planting and irrigation cycles affect yields is an ideal task for machine learning. How successful a harvest can be financially, more than ever, depends on various excellent data. This is why farmers, cooperatives and climate-smart agriculture development companies are doubling down on data-driven measures. They are also expanding the use of artificial intelligence and machine learning to improve the yield and quality of agricultural products.

On the basis of theoretical generalization, methods of analysis and synthesis, the practices of implementing artificial intelligence and climate smart agriculture were investigated. When conducting research, informational materials were used materials, including from sites that present research results and information on the implementation of artificial intelligence in climate smart agriculture.

At the final stage, SWOT analysis tools were used to determine the state and prospects for the use of artificial intelligence technologies in climate smart agriculture. This made it possible to identify strong parties, outline promising opportunities for the future, arising from the use of artificial intelligence in climate smart agriculture (table 1).
Table 1. SWOT analysis of the using AI technologies in agriculture

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI enables the analysis of large and complex datasets, facilitating data-driven decision-making processes in CSA.</td>
<td>The effectiveness of AI in CSA relies on the availability and quality of data, which may be limited or inconsistent in some regions or farming systems.</td>
</tr>
<tr>
<td>AI technologies, such as machine learning algorithms, can optimize resource allocation, crop management, and yield prediction, leading to increased efficiency.</td>
<td>Implementing AI technologies requires specialized knowledge and skills, posing a challenge for farmers and stakeholders with limited technical expertise.</td>
</tr>
<tr>
<td>AI enables precision agriculture practices by providing accurate and real-time information on crop health, soil conditions, and climate parameters.</td>
<td>Integrating AI systems and infrastructure may involve high initial costs, especially for small-scale farmers or resource-constrained regions.</td>
</tr>
<tr>
<td>AI technologies can automate repetitive tasks, reducing labor requirements and increasing productivity in CSA.</td>
<td>The use of AI raises ethical concerns related to data privacy, algorithmic bias, and unintended consequences, which require careful attention and regulation.</td>
</tr>
<tr>
<td>AI-based systems can identify early signs of pests, diseases, or climate risks, allowing for timely intervention and mitigation.</td>
<td>Access to AI technologies and resources may be limited, particularly in developing regions, hindering widespread adoption in CSA.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI can assist in developing adaptive strategies and risk management techniques to cope with the impacts of climate change on agriculture.</td>
<td>AI applications rely on large volumes of sensitive agricultural data, increasing the risk of data breaches and unauthorized access.</td>
</tr>
<tr>
<td>Improved Resilience: AI technologies can help build resilient farming systems by providing real-time insights, early warning systems, and adaptive management practices.</td>
<td>Biased data or algorithmic biases in AI systems can perpetuate inequalities and marginalize certain farmers or regions.</td>
</tr>
<tr>
<td>AI can facilitate knowledge sharing and collaboration among farmers, researchers, and stakeholders, enabling the exchange of best practices and innovative solutions.</td>
<td>Overreliance on AI technologies without proper fallback measures may pose risks if there are technical failures, power outages, or limited connectivity.</td>
</tr>
<tr>
<td>AI algorithms can be tailored to specific farming conditions, allowing for personalized recommendations and solutions based on individual farm requirements.</td>
<td>Resistance to change, lack of awareness, and cultural barriers can hinder the widespread adoption of AI technologies in CSA.</td>
</tr>
<tr>
<td>Increasing recognition of the potential of AI in CSA can lead to policy support and investment in research and development, fostering innovation and adoption.</td>
<td>The cost of implementing AI technologies may create disparities, exacerbating the digital divide and excluding resource-constrained farmers or regions.</td>
</tr>
</tbody>
</table>

As a result of the SWOT analysis of the use of AI technologies in climate-smart agriculture, several key observations and insights can emerge. Here are some possible outcomes:
- The analysis highlights the strengths of using AI technologies in climate-smart agriculture, such as data-driven decision-making, enhanced efficiency, and early disease detection. These strengths can be harnessed to optimize resource management, improve crop yield, and mitigate climate risks.

- The identified weaknesses, such as data quality and availability, technical expertise, and cost of implementation, can guide efforts to address these challenges. Steps can be taken to improve data collection and management systems, provide training and capacity-building programs, and explore cost-effective AI solutions for wider adoption.

- The analysis identifies opportunities to leverage AI in climate-smart agriculture, including improved resource management, climate adaptation, and precision farming. Stakeholders can focus on developing and implementing AI-driven tools, systems, and practices that align with these opportunities to enhance sustainability and resilience in agriculture.

- The analysis acknowledges potential threats, such as data privacy and security concerns, algorithmic biases, and social acceptance issues. This understanding allows for the development of robust frameworks, regulations, and ethical guidelines to mitigate risks, build trust, and ensure responsible and equitable AI adoption in agriculture.

- The SWOT analysis serves as a basis for strategic decision-making in the integration of AI technologies in climate-smart agriculture. It helps stakeholders prioritize actions, allocate resources effectively, and foster collaborations to maximize the benefits of AI while minimizing potential drawbacks.

Application of artificial intelligence in climate smart agriculture allow analyzing and processing large amounts of information, combining various information resources on one platform, controlling and reducing production risks, meeting the information needs of a wide range of stakeholders, from the state to the end user, as well as ensuring security in cyberspace. An important role in the climate smart agriculture is played by the resource potential of people employed in smart agriculture. Special attention is paid to the development of research centers, training courses, where an in-depth study of modern high-precision agricultural technologies is conducted.

To analyze the survey on the application of artificial intelligence (AI) in climate-smart agriculture, we were examining the responses and draw insights based on the provided data. Let's analyze the data you provided (table 2).

<table>
<thead>
<tr>
<th>Level of Familiarity</th>
<th>Number of Respondents</th>
<th>Percentage, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>Low</td>
<td>100</td>
<td>40</td>
</tr>
<tr>
<td>Moderate</td>
<td>60</td>
<td>24</td>
</tr>
<tr>
<td>High</td>
<td>30</td>
<td>12</td>
</tr>
</tbody>
</table>
Very Low Familiarity: 50 respondents (20%) reported very low familiarity with AI in climate-smart agriculture. This indicates that a significant portion of the respondents lacks knowledge and understanding of AI in the context of sustainable agriculture. Additional efforts are needed to educate and raise awareness among this group about the potential benefits and applications of AI in climate-smart agriculture.

Low Familiarity: 100 respondents (40%) reported low familiarity with AI in climate-smart agriculture. This suggests a relatively larger group with some awareness of AI but limited knowledge and practical experience. It is essential to focus on providing training, resources, and information to this segment to enhance their familiarity and encourage the adoption of AI solutions in agriculture.

Moderate Familiarity: 60 respondents (24%) indicated a moderate level of familiarity with AI in climate-smart agriculture. This group possesses a reasonable understanding of AI and may have some experience in utilizing AI applications in the agricultural sector. Building upon their existing knowledge, it would be beneficial to provide further training and support to help them maximize the potential of AI in their agricultural practices.

High Familiarity: 30 respondents (12%) reported a high level of familiarity with AI in climate-smart agriculture. This smaller group demonstrates a strong understanding of AI concepts and techniques, indicating that they might already be actively using AI in their agricultural practices. Leveraging their expertise and experience, it would be valuable to encourage knowledge sharing and collaboration with other stakeholders to drive further innovation in this field.

Very High Familiarity: 20 respondents (4%) reported a very high level of familiarity with AI in climate-smart agriculture. This group likely consists of experts or advanced researchers who possess extensive knowledge, experience, and engagement with AI applications in the agricultural domain. Their insights and expertise can be utilized to develop advanced AI-driven solutions and guide future research and development efforts.

Recently, there has been a sharp increase in the number of publications of the Web of Science database on the application of these technologies in agriculture. In the course of the study, a total of 889 such an article published from 2017 to 2022. At the same time, the largest increase was observed in 2022 and in addition, an analysis was made of the number of publications in the largest scientific citation database WoS in the context countries (Table 3).

Summarizing the data of some artificial intelligence technologies used in agriculture, we can highlight some of their common characteristics. AI technologies used in climate-smart agriculture have a number of significant features, namely:

<table>
<thead>
<tr>
<th>Very High</th>
<th>20</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>260</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Familiarity Level</th>
<th>Number of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>50</td>
<td>20%</td>
</tr>
<tr>
<td>Low</td>
<td>100</td>
<td>40%</td>
</tr>
<tr>
<td>Moderate</td>
<td>60</td>
<td>24%</td>
</tr>
<tr>
<td>High</td>
<td>30</td>
<td>12%</td>
</tr>
<tr>
<td>Very High</td>
<td>20</td>
<td>4%</td>
</tr>
</tbody>
</table>
AI relies on large volumes of data collected from various sources, including weather stations, sensors, satellites, and historical records. By analyzing and processing this data, AI technologies can provide valuable insights and support data-driven decision making in agriculture. This allows farmers to optimize resource allocation, implement precision farming techniques, and make informed choices based on real-time information. These are technical solutions, primarily software and hardware tools for performing certain agricultural work or forecasting development of the industry depending on various factors (climate, soil conditions, rainfall, prices for market). AI technologies are often used together with robotics, here we can talk about their interaction. So, the robot provides movement, manipulation of objects and tools, and AI technologies, in in turn, carry out orientation in space, choose the optimal tools for the robot when performing a certain job, recognize obstacles and objects, etc.

**CONCLUSION**

These applications of AI in agriculture and animal farming illustrate its potential to enhance efficiency, productivity, and sustainability. By leveraging AI technologies, farmers can optimize resource usage, improve decision-making, and mitigate risks, ultimately contributing to more sustainable and resilient agricultural practices.

Climate-Smart Agriculture aims to create a sustainable and resilient agricultural system that can adapt to and mitigate the impacts of climate change. By embracing the principles and objectives of CSA, farming communities can enhance productivity, build resilience, reduce greenhouse gas emissions, and contribute to sustainable development goals.

<table>
<thead>
<tr>
<th>Countries</th>
<th>Number of publications</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>265</td>
</tr>
<tr>
<td>USA</td>
<td>168</td>
</tr>
<tr>
<td>Australia</td>
<td>77</td>
</tr>
<tr>
<td>Spain</td>
<td>43</td>
</tr>
<tr>
<td>Italy</td>
<td>62</td>
</tr>
<tr>
<td>Germany</td>
<td>49</td>
</tr>
<tr>
<td>Japan</td>
<td>77</td>
</tr>
<tr>
<td>France</td>
<td>69</td>
</tr>
<tr>
<td>Greece</td>
<td>79</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>889</strong></td>
</tr>
</tbody>
</table>
By leveraging the power of AI in agriculture and animal farming, stakeholders can enhance their capacity to mitigate climate risks and build resilience. The applications of AI enable better decision-making, adaptive practices, and early interventions, leading to more sustainable and climate-resilient agricultural systems.

In conclusion, artificial intelligence (AI) has the potential to revolutionize and contribute to climate-smart agriculture, leading us toward a sustainable farming future. By harnessing the power of AI, farmers and agricultural stakeholders can make more informed decisions, optimize resource utilization, and mitigate the negative impacts of climate change on food production.

AI technology enables the collection and analysis of vast amounts of data, including weather patterns, soil conditions, crop growth stages, and pest infestations. By processing and interpreting this data, AI systems can generate valuable insights and provide recommendations to farmers in real-time. This empowers farmers to optimize their practices and make more sustainable choices.

One key application of AI in climate-smart agriculture is precision farming. AI-driven tools, such as remote sensing and satellite imagery, can accurately monitor crop health and identify areas requiring specific interventions. This enables targeted irrigation, fertilization, and pest control, minimizing the use of resources and reducing environmental impact.

AI also plays a crucial role in climate modeling and prediction. Machine learning algorithms can analyze historical climate data and identify patterns, allowing for the creation of accurate climate models. These models can help farmers anticipate climate-related risks, such as droughts or floods, and take proactive measures to adapt their farming practices accordingly.

Furthermore, AI can support the development of climate-resilient crop varieties. By analyzing genetic data and simulating plant breeding processes, AI algorithms can expedite the identification and development of crops that are more tolerant to extreme weather conditions or resistant to pests and diseases. This not only enhances crop yields but also reduces the reliance on chemical inputs.

Collaboration and knowledge sharing are essential for the successful integration of AI in climate-smart agriculture. Governments, research institutions, and technology companies need to work together to ensure that AI solutions are accessible, affordable, and tailored to the needs of farmers in different regions. Furthermore, data privacy and security concerns must be addressed to foster trust and facilitate the widespread adoption of AI technologies.

Future technical development will help businesses interested in enhancing AI-based goods or services, such as training data for smart agriculture, drones, and automated machine manufacturing, allowing the globe to address challenges with food supply for a growing population. The future of AI in climate smart agriculture will require a significant focus on universal access because the majority of cutting-edge technology is only utilized on big, well-connected farms. The future of ML-automated agricultural goods and data science in farming will be secured by extending reach and connection to small farms in distant regions worldwide. Because AI maximizes resource utilisation and efficiency and, to a significant part, resolves the
resource and labour shortage, it will be helpful and effective in the agriculture industry. This technology will also play an essential role in research and development in the field of horticulture.

The authors made recommendation on how to helping farmers AI-enabled technologies use data like temperature, precipitation, wind speed, and solar radiation in combination with ML algorithms and images taken by satellites and drones to predict weather conditions, analyse crop sustainability, and evaluate farms for the presence of diseases or pests and inadequate plant nutrition. Farmers with Wi-Fi connectivity may use AI applications to receive an AI-tailored farm plan. Using AI-driven solutions that enhance output and income without diminishing priceless natural resources, farmers can fulfil the global need for higher food supply and profitability. Farmers can use AI to get real-time insights from their fields, identifying areas that need irrigation, fertilisation, or pesticide treatment. Innovative in climate smart agriculture practices such as vertical agriculture may help increase food production while using lesser resources. As a result, herbicides are used less, harvest quality is improved, profits are increased, and significant cost savings are realised. AI tools collect high-resolution aerial images and data on irrigation systems needed for the fields. AI aids in the detection of soil issues such as clogs and leaks. It assesses and rates the soil's poor condition; AI assists in increasing farm productivity. The net output from the field is improved by automated and autonomous farming operations, AI-enabled productions, and yield management. AI-assisted picking, packing, and sorting enhances food production, packaging, and sorting. Farmers benefit from its assistance in comprehending agricultural data insights related to temperature, precipitation, wind speed, and solar radiation. Farmers’ problems, such as climate change and insect and weed infestations that lower yields, may be resolved through AI solutions. AI will be used in climate smart in agricultural to improve the entire agriculture process.

This work explored the possibilities creation and implementation of such AI technologies that would make current and future climate smart agriculture more sustainable. The analysis showed that although the technology AI is developing and becoming an integral part of agriculture. We still need to find ways to embed and develop AI in our Climate smart agriculture taking into account the requirements of sustainability, as well as minimize negative social ecological effects of ecosystem sustainability.

Finally, in the context of smart and sustainable climate smart in agriculture, artificial intelligence is an emerging area of research. Further theoretical and empirical research is needed considering this phenomenon from different angles and within different disciplines to create the knowledge base that politicians, managers, farmers need to were able to take informed implementation decisions AI in agriculture and offset the inevitable problems that will follow. This will not be an easy task. The fusion of artificial and human intelligence is the next a big challenge for climate smart sustainable development.

In conclusion, the integration of artificial intelligence in climate-smart agriculture holds great promise for a sustainable farming future. By leveraging AI's capabilities, farmers can make informed decisions, optimize resource allocation, reduce environmental impact, and build resilience against the challenges posed by
climate change. As AI technologies continue to advance and become more accessible, they have the potential to transform the agricultural sector, ensuring food security and sustainable farming practices in the face of a changing climate.

Addressing climate change in agriculture is not only a necessity but also an opportunity. By embracing sustainable farming practices, harnessing technological advancements like artificial intelligence, and promoting policy support, we can create a resilient and sustainable agricultural sector. This not only helps mitigate climate change but also ensures food security, supports rural communities, preserves biodiversity, and promotes environmental stewardship for a more sustainable future.

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CONSUMER BEHAVIOR MODELING OF “SMART” SCALES CHOOSING

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ABSTRACT

Objectives: at the beginning considered approaches for analysis of consumer behavior, its evolution, basic principles, advantages; in relation to products and household goods of daily demand, and factors affecting behavior and choice; the goal of the study was to develop a model for consumer comparative assessment of products offered on the market based on a comparison of the basic user and technical characteristics of these products that are important to potential buyers.

Methods/Approach: was developed buyer’s multicriteria model for the estimation and selection of household smart diagnostic scales using the methodology of fuzzy modelling; were given groups of users of household diagnostic scales for monitoring the state of the body on the Ukrainian market; consumer criteria when buyers choose smart scales had been identified, described and formalized; as a method of modeling, fuzzy logic was chosen, because this approach allows accurately reflect consumer preferences and potential choice.

Results: applied model for estimating qualities of smart scales by customers in Matlab was developed; the membership functions and terms were defined and constructed, as well as fuzzy rules to make decisions on the estimation of compared smart scales; the numerical example for scales presented on the market was given.

Conclusions: calculations and analyze of results confirmed the applicability of the proposed approach and its correctness for modeling consumer behavior by fuzzy logic models; the prospects of application, development, and improvement of the developed model and the proposed approach were determined.

Keywords: consumer behavior, customer choice, diagnostic scale, product evaluation, multicriteria modeling

JEL classification: D12, D19, L67, M39

Paper type: Research Paper

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INTRODUCTION

As is well known, the study of consumer behavior becomes a very important area of applied economic research in the context of globalization of markets for goods and services (Matyushenko et al., 2020; Ramazanov & Petrova, 2020). This fully applies to consumer goods to maintaining health, healthy lifestyle, self-monitoring of the human body and exercise physical culture.

Recently, a significant number of such fundamentally new products have appeared (Dubovik et al., 2017), in particular, various fitness devices, devices, and technologies based on the principles of a smart home and smart appliances for everyday use etc.

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Traditional household goods, in particular, intended for health monitoring (scales, thermometers, toothbrushes, blood pressure measuring devices, glucometers, hearing aids) are also being improved. They acquire qualitatively new consumer properties associated with advanced computer technologies, the concept of smart home appliances, according to smart home technologies and Internet of things as a general direction for the development of technical goods for daily use. On the other hand, the rapid development and dominance of the mentioned Internet technologies and the corresponding approaches of social media marketing have made the consumer choice of such goods more conscious, motivated, information and mentally justified (Richard and Chebat, 2016; Richard and Habibi, 2016; Vatamanescu et al., 2017). At the same time, the choice of a certain product by the buyer often continues to be largely emotional, subjective and personal action (Scheibehenne et al., 2015; Stuart et al., 1987; Villiers, 2015).

Therefore, in this case, the issue of modeling consumer choice becomes quite relevant. It should be noted that the basic fundamentals of it remain various forms of expert surveys of consumers, their processing by various economic and statistical methods (Anghelache et al., 2016; Bushra, 2015; Ertz et al., 2016; Hakkak et al., 2015). However, often such approaches are faced with quantitative deficiency, qualitative ambiguity, the fuzziness of the initial information, which complicates their further application and reduces the reliability of the resulting calculations (Kavita and Shivani, 2016; Oliveira et al., 2015; Rybanská, 2015; Sakkthivel, 2012).

One possible approach to overcome these difficulties is to apply fuzzy sets theory and fuzzy modeling to formalize consumer choice (or product evaluation). The availability of specialized computer programs makes such models simple enough for development, testing, convenient for subsequent practical application (Dorokhov et al., 2010). More detailed information about usage of fuzzy modeling for economics in general can be found in other similar studies (Ferrer et al., 2020; Imanov, 2021).

As an example of the practical implementation of this approach, in this paper, we propose a model of multi-criteria evaluation (and possible consumer choice) of intelligent household electronic diagnostic scales, from the number of household appliances offered in the Ukrainian market for health.

**MATERIALS AND METHODS**

**Basic paradigms in the general analysis of consumer behavior.**

Analysis of the literature on the study of consumer behavior shows the presence of two main points of view: the traditional view of the motivation and behavior of the buyer (traditionally positivistic paradigm) and the interdisciplinary marketing approach (interpretive paradigm) (Markovic et al., 2021; Christofi, et al., 2023; Kastanakis et al., 2022). The positivistic approach assumes an objective view of the world and uses quantitative methods of investigation. The paradigm of interpretation is subjective and often uses qualitative methods.

Traditional researchers seek to decipher the causes (generating certain components of consumer behavior) and postulate relevant generalizations. Supporters of the interpretive paradigm tend to treat each consumer individually and consider each act of consumption to be unique (Alharahsheh and Pius, 2020; Ma and Ma, 2022; Oleksy-Gębęczyk, 2023).
The positivist-traditionalist paradigm for several decades (approximately, 1900-1970) had a significant impact on economic science (Thielemann, 2020; Rabby et al., 2021; Jaja et al., 2022). Its main assumption is that human thinking is the driving force of all human actions. Also, positivists postulate the existence of the supreme truth, which is unique, objective, and can be revealed only through science (Rahi, 2017; Lim, 2023).

Positivists perceive the world as a rationally organized space, with a clearly delineated past, present and future. The traditionally positivistic paradigm has evolved from pure traditionalism (in which three main points dominate: rationalistic view, behavioral and cognitive standpoints) to neopositivism (Table 1).

The latter complements the values of the conservative paradigm by developing mathematical models and recognizing society as an important determinant of consumer decisions and behavior (McCloskey and Silvestri, 2021; Grace, 2021).

**Table 1. The evolution of the positivist paradigm.**

<table>
<thead>
<tr>
<th>Time period</th>
<th>Dominant perspective</th>
<th>Scientists, theorists</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900 – 1930</td>
<td>rationalistic</td>
<td>Smith (1776); Marshall (1890)</td>
</tr>
<tr>
<td>1930 – 1950</td>
<td>behavioral</td>
<td>Skinner (1953); Howard (1963)</td>
</tr>
<tr>
<td>1970 - 2000</td>
<td>interpretive</td>
<td>Rahi (2017); Thielemann (2020); Rabby (2021); Jaja (2022)</td>
</tr>
<tr>
<td>2000 - 2022</td>
<td>consumerative</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Own author’s elaboration*

A rationalist paradigm suggests that consumer behavior belongs to the unique reactions that they possess. The main assumptions of this paradigm are the following: people have a full understanding of their needs and know all the available means for their satisfaction. Consumers distribute and spend their resources (revenues) in order to meet those needs that are more useful to them and give more pleasure (Schifman et al., 2010).

So, people buy goods (services), the costs of which can afford. The purchase decision is equivalent to allocating resources to maximize utility within financial constraints. The consumer evaluates each alternative and acts rationally (utility maximization is the only motive of behavior). That is, the rational paradigm is based on the classical theory of the marginal economy, according to which price has primary importance when all other variables remain on the same level. Human needs, attitudes, and motives can be measured by analyzing the distribution of resources, income and budget constraints of consumers (Balaure, 2003). Such economic models support behavioral hypotheses (the higher incomes - the higher costs). However, their effectiveness depends on whether all individuals act as computers in making their decisions (Pachauri, 2002).

Although the relationship between income and expenditure is not meaningless, consumer behavior is much more complex (Persky, 1995). At the same time, consumers often do not have enough information, motivation or time to make ideal rational decisions without taken into account the daily diverse social and cultural influences during each day of their life (Simon, 1997). It will be simplistic to assume that the determining factor is the desire to optimize only the monetary component of the solution. Despite this, such models (Muth, 1966) served as starting points for the further development of consumer behavior theories.

If the rational paradigm emphasizes the importance of costs and resources (as the main factors of consumer decisions), then the behavioral paradigm (learning model) emphasizes the role of external and uncontrolled factors (dependent, however, on individual learning processes and previous consumer decisions). The basic
premise is that behavior is determined by the actions of people under the influence of certain stimuli. The consumer acts as a black box that reacts to external factors encountered (Peter and Nord, 1982). Therefore, the behavioral paradigm tries to define a complete set of external sources that determine the actions of consumers in a certain manner. The main approaches are classical and operant conditioning (both are reduced to learning, but through different processes). In line with logical positivism, it is asserted that objective and empirical methods of exact sciences can be applied to the study of consumer behavior (Eysenck, 2000).

Classical conditioning assumes that the mentality of the individual is a "black box" between inputs and outputs. And if the inputs can be monitored and monitored, the outputs can only be analyzed as the consequences of input data. However, the assumption that occurs inside the "black box" as a result of a certain input, is only a posteriori conclusion to which one should be treated with caution.

The learning process itself includes incentives, suggestions, reactions (Kotler et al., 2002). Incentives are personal motives that determine the need for certain purchases. Proposals are the result of the interaction of external factors and the response of individuals to stimuli. The interaction of incentives and proposals triggers a consumer reaction. According to the theory of classical conditioning, different consumers will have similar reactions when they encounter the same external stimuli.

The generalization of stimuli and individual responses to all consumers (the so-called classical behaviorism) is an attempt to define a complete set of external factors affecting consumer behavior without taking into account that individual mentality or internal states do exist (Bray, 2008). This generalization of behavior ignores the role of the individual's personal experience in interpreting external stimuli.

Radical (operant) conditioning recognizes the existence of personal experience and feelings but considers them secondary (Nye, 1979). The consumer reacts only to incentives that give personal benefits and avoids situations that may prove harmful. This behavior is formed in the process of long training. The corresponding theory of prospects explores the irrationality of consumer behavior and the influence of various factors on the adoption of consumer decisions. Such studies develop a common knowledge of human behavior. The diverse range of views and explanations associated with sustainable consumer behavior makes it a complex phenomenon to understand and predict (Ismailov & Krivins, 2023).

But behaviorism can only partially explain the complexity of human behavior and decisions (Stewart, 1994). After all, behaviorism does not reflect the relationship between external exits and internal psychological processes, as well as the conclusions that consumers make in the process of acquisition. However, advertising and other promotion methods successfully use the principles of behaviorism (Lai and Ya-Shin, 2011; Scheibehenne et al., 2015). In contrast to the behavioral theory, the cognitive paradigm (information processing theory) emphasizes the central role of information components in the processes of making consumer decisions. Consumers are seen as solvers of problems that actively use available information to control the external environment. The current culture of consumption must change to enable a transition to a circular economy; otherwise, policies at EU level, such as the European Green Deal and the Circular Economy Action Plan will remain only theoretical instruments that will not change the course of the current unsustainable economic
paradigm. (Ismailov, 2023). Studies (Allen and Madden, 1985; Langer, 1983) prove the existence of unconscious cognitive processes, the actions of which lead to rational purchasing decisions (Solomon et al., 2010).

The cognitive paradigm improves understanding of consumer decisions, their successive actions, feelings, and behavior (Marsden and Littler, 1998). The cognitive paradigm recognizes that internal factors and processes (cognition, feelings) can lead to action in the absence of external stimuli. From an empirical point of view, cognitive theory emphasizes internal processes. However, it analyzes consumers as identical, congruent and symmetric entities that process the inside information in the same way. Numerous cognitive models try to present reality and predict the generalized behavior of consumers. Researchers point out that positivism pays much attention to material well-being, that its ideology generalizes the cultural homogeneity of predominantly Western societies (Solomon, 2004). Critics argue that focusing on science and technology positivistically denies the social complexity of the world in which consumers operate.

Interpretation paradigm (emerged in the late 1980s in tandem with the development of critical thinking in marketing (Kassarjian, 1982)) emphasizes the importance of subjective experiences, symbols and cognitive abilities of consumers. They enhance their own possibilities for interpreting realities based on cultural and perceptual experiences. This paradigm (unlike the traditionalist point of view) better reflects the interests of consumers, their role in understanding reality, in forming a set of expectations that lead to the formation of individual consumption experience (Calder and Tybout, 1987; Hirschman, 1993; O'Shaughnessy and Holbrook, 1988).

If the positivistic paradigm is aimed at predicting behavior on the basis of direct observation, then the interpreter seeks to understand this behavior. Traditionalists postulate the identity of specific causes of consumer behavior, whereas interpretive approaches analyze multiple events where people participate directly or indirectly, consciously or subconsciously. The paradigm of interpretation admits that there is often no separation between the researcher and his object of study. Thus, the researcher himself becomes part of the research that he conducts. A number of authors (for example, (Usunier and Lee, 2005)) admit differences in the level of understanding of the interpretational approach, even between European and American researchers (in particular, European attach great importance to cultural differences of consumers, their different personal experiences). Interpretive (postmodern) paradigm question (Firat et al., 1995) rationalistic models and methods of analyzing consumer behavior (mathematical modeling, quantitative and qualitative methods), the very idea that consumers can be understood and objectively studied.

Some authors (Marshall, 2012; Morgan, 1992) emphasize the need to integrate traditional and postmodern approaches into an integrated system (paradigm). It provides that understanding consumer behavior can only be achieved through the adaptation and sharing of several paradigms and/or their parts (although serious complications in the comparability of paradigms are postulated in (Kuhn, 1962).

The basic principles of this approach are as follows: no part of the consumer experience can be understood if it is considered in isolation. The combination of the results obtained by different methodologies, theories,
and mathematical approaches makes it possible to obtain better and reliable information about the behavior of consumers in comparison with the application of any particular approach.

A holistic approach uses methods that can identify consumption habits and their recurrences over time (O’Shaughnessy and Holbrook, 1988). Consumer behavior is understood as a continuous process of buying and consuming. Despite the advantages of a holistic approach, its complexity causes a lack of specific applications in the analysis of consumer behavior. However, the study of consumer behavior does require a holistic application of the principles and tools of various disciplines and applied fields of research (Engel et al., 1986). At the same time, it is the basis for more narrow research in marketing, strategy, financial planning, organizational behavior and applied economic analysis. The lack of deep and thorough knowledge of these relations has a direct impact on decision-making on tax planning, payment of taxes, social security contributions, etc. (Aleksandrova & Ismailov, 2021). On the one hand, the growing consumer needs led to an increase in industrial energy consumption – to produce goods and services, the economy needed more energy, and on the other hand – improving the living standard of households led to an increase in households’ energy consumption (Todorov, Aleksandrova, & Ismailov, 2023). In general, the analysis of consumer behavior creates the basis for the evolution of these areas of economic research using various research tools and disciplines.

**The behavior of everyday goods consumers.**

Obviously, consumers (buyers, customers) are valuable assets for any commercial organization in a competitive market environment. Therefore, to achieve success, it is very important to understand and predict their behavior. Consumers are individuals (groups) who choose, buy, use goods, products, services, ideas, experiences to meet needs and desires. In other words, consumers are the final destination of any products or services. Analysis of consumer behavior contains components of psychology, sociology, social anthropology, economics, and is directed to the processes of making decisions (individual and group).

At the same time, the characteristics of individual consumers (economic, social, demographic, behavioral, etc.) are studied; the influence of family, friends, reference groups, and society on them is assessed. The study of client’s behavior is based on consumer behavior of the buyer. In this case, the client can be in the role of users, payers, buyers (Thapa, 2012). There is a strong relationship between consumer behavior and the marketing strategy of the company, as its success depends on the understanding of consumers’ behavior managers. The decision of consumers about the purchase testifies to the extent to which the marketing strategy corresponds to market demand. So, marketing begins and ends with the consumer.

Studying the behavior of consumers allows you to determine the direction of its changes and determine the desired trends in product development, attributes, alternative methods of communication and the like. However, consumer behavior is difficult to predict even for experts (Armstrong, 1991).

Consumer behavior should be considered the most important variable in marketing activities (which is difficult, but desirable to control). A product (service) should be considered not only in terms of physical characteristics but in the context of its own image (in accordance with the social, psychological conditions,
views of the individual consumer or group) (Proctor and Stone, 1982). Then you can improve understanding and forecasting of both the subject of purchases, motives and frequency (Schifman and Kanuk, 2007).

An important underlying assumption (in studies of consumer behavior) is that people often buy goods for their subjectively palpable values, rather than essential basic functions (Stávková et al., 2008). Often, out of habit, consumers evaluate the product not only by its main attributes (the utilities that it provides).

They consider the product according to real, specific qualities in combination with some extended characteristics (less significant). The latter sometimes even prevail, creating imaginary advantages for the consumer (for example, appearance, service, advice and after-sales service, etc.) (Foret and Procházka, 2007).

Therefore, it is necessary to understand the main requirements of consumers and to study the main causes and characteristics of their behavior. That is determine who is the customer, what they want, how they use the product and react to it. Usually, customer needs are studied by conducting empirical studies (consumer surveys) to identify the components of consumer behavior (models, factors, and incentives). The behavior of visitors (when, why, how, they buy the product) can be represented by a black box model (Table 2). It shows how incentives, consumer characteristics, decision-making processes, consumer reactions are interrelated.

Table 2. Black box model for customer behavior.

<table>
<thead>
<tr>
<th>Marketing factors</th>
<th>Perception of the visitor (black box)</th>
<th>Buyer's feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product; price;</td>
<td>need; awareness of the problem;</td>
<td>product selection;</td>
</tr>
<tr>
<td>place; promotion</td>
<td>personality; search for information;</td>
<td>choice of brand;</td>
</tr>
<tr>
<td>environment</td>
<td>culture; evaluation of alternatives;</td>
<td>purchase amount;</td>
</tr>
<tr>
<td></td>
<td>lifestyle; decision purchase;</td>
<td>acquisition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>frequency</td>
</tr>
</tbody>
</table>

Source: Own author's elaboration

These stimuli can be interpersonal or intrapersonal (Sandhusen, 2000). Such a model is connected with the theory of behaviorism, where the processes inside the consciousness of the consumer are important, and the relationship between its stimuli and reactions is important. At the same time, although marketing incentives are developed and created by producers and sellers, the effectiveness of their impact on the consumer depends significantly on social factors (based on the economic, political and cultural conditions of society).

Thus, the buyer's black box contains his perception, decision-making process, reaction, and actions. The buyer's personality affects the perception of irritants. The decision-making process determines how the behavior becomes. Important to understanding the behavior of the buyer are factors that determine its characteristics as a black box. These factors are classified and configured in various ways (Table 3).

Table 3. Black box model for customer behavior.

<table>
<thead>
<tr>
<th>The most important, key factors</th>
<th>Researchers</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>relative factors, physical factors, social factors</td>
<td>Stanton</td>
<td>1997</td>
</tr>
<tr>
<td>physical factors, social factors, cultural factors</td>
<td>Lancaster, Reynolds</td>
<td>1999</td>
</tr>
<tr>
<td>lifestyle and demographic factors</td>
<td>Straughan, Roberts</td>
<td>1999</td>
</tr>
<tr>
<td>physical factors, social factors, relative factors</td>
<td>Pride, Ferrell</td>
<td>2000</td>
</tr>
<tr>
<td>physical, social, cultural factors, personal factors</td>
<td>Kotler, Armstrong</td>
<td>2007</td>
</tr>
<tr>
<td>cultural, social, personal, psychological factors; marketing mikst</td>
<td>Furaji, Latuszynska, Wawrzyniak</td>
<td>2012</td>
</tr>
<tr>
<td>rationalistic view, behavioral cognitive standpoints</td>
<td>Rahi</td>
<td>2017</td>
</tr>
<tr>
<td>automation, digitalization, hyperconnectivity, obligations</td>
<td>Lim</td>
<td>2023</td>
</tr>
</tbody>
</table>
In general, these factors are divided into five groups: physical, personal, cultural, social and marketing mix. They stand out to distinguish between the impact on behavior and to determine the target consumer segments. As a result, market fragmentation and targeting of marketing activities into individual categories of consumers are carried out. After all, consumer desires are different for different types of behavior. At the same time, the more expensive the product, the more information the consumer needs and his involvement in the purchase process increases (Table 4).

Table 4. Buyer behavior and involvement.

<table>
<thead>
<tr>
<th>Differences between brands</th>
<th>High involvement</th>
<th>Low involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant</td>
<td>complex behavior</td>
<td>behavior that seeks diversity</td>
</tr>
<tr>
<td>Minor</td>
<td>dissonant behavior</td>
<td>behavior of buying out of habit</td>
</tr>
</tbody>
</table>

Source: Own author's elaboration

High involvement occurs if the product is very in demand or expensive (for example, the consumer is very actively involved in buying a car). On the contrary, low involvement is observed when the consumer is not very active in buying, in particular at low cost (for example, buying salt, the consumer is not too interested in buying). Also, differences in the buyer's perception of brands should be taken into account with significant or (on the contrary) small differences between them.

Therefore, from the point of view of participation in the actual purchase process, four basic types of consumer behavior are possible. Complicated behavior: when the consumer is very involved in the purchase and knows about the significant differences between the brands. Then the consumer requires a maximum of information about the characteristics of the product. The marketer needs to convincingly present the advantages that determine the positive components of the proposed brand. Behavior associated with diversity: there is low consumer involvement in the purchase of the product, while there are significant differences between brands. In this case (quite often) consumers buy different products not because of discontent, but in search of diversity. The marketer should be encouraged to buy exactly this product (discounts, bonuses, discounts, free samples, advertising, etc.). Dissonant behavior: the consumer is very involved in the purchase, but there are only minor differences between the brands, which can often spontaneously change the choice of the product. Behavior by established habit: there is low involvement and there is a slight difference between brands. The consumer simply buys the product to which he is accustomed for a certain previous period of time.

RESULTS

Target groups of users of household diagnostic scales for monitoring the state of the body.

As is well known, the target audience is all real and potential consumers of the goods, interested in it for a certain time or ready to change their preferences in favor of this product. The target audience includes both direct consumers and those who make purchasing decisions or affect it. It is consumers who determine the success of the product (its producers and sellers) on the market.

A comprehensive study of the target audience of medical products underlies the understanding and identification of key consumer needs. It gives the pharmacy the opportunity to meet these needs with the help
of appropriate product offers, and therefore, be competitive in market conditions. Understanding the structure and characteristics of the target audience ensures the development of a successful marketing strategy.

The effectiveness of marketing communications (the development of channels, types, means of promoting pharmaceutical products) directly depends on the characteristics of consumer behavior of the target audience.

The main criteria for its analysis are: geographical (country, region, city, population density, climate) demographic (age, sex, family size and stage of its life cycle); socioeconomic (occupation, education, attitude to religion, nationality, level of income), psychographic (lifestyle, personality type, personality traits, life position) behavioral (motives of buying, sought-after benefits, type of buyer, perception of goods, organizations).

The methods of research of the target audience are numerous and varied. The most important are the primary, direct (field) methods of marketing research that receive marketing information directly from its source. Despite the laboriousness, cost, duration of processing information and its subjectivity, in practice, quantitative methods of the interview are most often used: questionnaires and interviews. They provide the complete information about the target audience.

We conducted marketing research to study the target audience and identify consumer preferences when buying diagnostic scales for home use. They were carried out using questionnaires with elements of interviews among visitors to medical equipment desk of Pharmacy №2 (20, Constitution Square, Kharkiv, Ukraine). We used the blind non-repeated sampling (with 590 respondents). Target audience structure by ages (full years old), occupations of respondents, and sources of information about household diagnostic scales are shown in Table 5. The main motive for weight control for 62% is beauty, beautiful appearance, for 38% - is health.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>%</th>
<th>Occupation</th>
<th>%</th>
<th>Sources of information</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 - 25</td>
<td>3</td>
<td>students</td>
<td>8</td>
<td>internet</td>
<td>40</td>
</tr>
<tr>
<td>26 -35</td>
<td>30</td>
<td>entrepreneurs</td>
<td>13</td>
<td>media, television, radio</td>
<td>4</td>
</tr>
<tr>
<td>36-45</td>
<td>38</td>
<td>specialist</td>
<td>39</td>
<td>relatives, friends, colleagues</td>
<td>31</td>
</tr>
<tr>
<td>46-55</td>
<td>24</td>
<td>housewives</td>
<td>17</td>
<td>shops, sellers, consultants</td>
<td>13</td>
</tr>
<tr>
<td>older 56</td>
<td>5</td>
<td>civil servants</td>
<td>11</td>
<td>recommedations of doctors</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>state employees</td>
<td>9</td>
<td>others</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Own author's elaboration

In general, informal Internet and WOM (Word of Mouth) communications are extremely important in the promotion of these products. Personal sales and consultations of sellers also play an important role in obtaining information about household appliances for monitoring the state of the body. When developing a marketing strategy and planning a complex of marketing communications, the lifestyle of potential and real buyers becomes important. Potential buyers of household diagnostic scales are consumers who carefully monitor the health status, proper nutrition, physical activity, control the weight and other components of their body.

These are not only people with abnormal (superfluous or insufficient) weight (middle, older age), but also all for whom normalization and weight retention is an important health issue. Therefore, the target groups of potential users of the diagnostic scales are: people of normal weight (watching their bodies), people with excess
or insufficient weight (other health problems), youth and adolescents; young mothers and pregnant women (those who plan pregnancy), elderly people; athletes (actively physically trained in medical, preventive, health-improving purposes).

It is clear that the motivation to maintain a normal weight and control the body composition of these groups are different. However, various household diagnostic scales (offered on the market) can meet their requirements taking into account the characteristics of each of the listed consumer groups.

Pharmacies (when they offer these devices) should only develop an appropriate marketing strategy, plan effective marketing communications in accordance with the characteristics and behavioral characteristics of various groups of potential and real consumers. This is a necessary condition for increasing the competitiveness and successful operation of pharmacy institutions in market conditions. It should be noted that in spite of a certain number of scientific publications on the interaction of pharmacies and customers (visitors, customers), the overwhelming majority of them have focused on issues related to medicines and related medical products.

On the contrary, the marketing components of sales and promotion in the pharmacies of complex technical products of medical purpose, the functional of which provides control and maintenance of the health in the household conditions by the population (inhalers, glucometers, ionizers, diagnostic scales, air purifiers, quartz lamps, etc.) pores have not been adequately researched.

**Characteristics for comparative evaluation and choice of diagnostic scales.**

Health and physical aspects of human life are very important, and for their control are needed (and now become widespread and available) various household technical devices that can objectively measure various physical indicators. One such device is the floor scale. There are three groups of household body floor scales in the market: simple mechanical scales, conventional electronic, and diagnostic (smart) scales. The market offers a large number of models from various manufacturers, with different functional capabilities, the ability to determine a lot of useful information about the state of the body.

Simple and accessible are mechanical scales. More functional are electronic scales, which often have various additional functions. However, the most modern representatives of electronic scales are the recently developed so-called diagnostic (smart) scales. They determine not only the mass but also analyze in sufficient detail the composition of the human (user) body during weighing.

**Table 6. Parameters of the person body composition for diagnostic by smart scales.**

<table>
<thead>
<tr>
<th>Determining directly during measure</th>
<th>Calculate by smart scale algorithm</th>
</tr>
</thead>
<tbody>
<tr>
<td>total body weight</td>
<td>body mass index</td>
</tr>
<tr>
<td>body fat (as a percentage)</td>
<td>physical development rating</td>
</tr>
<tr>
<td>percentage of internal fat</td>
<td>physical type and body structure</td>
</tr>
<tr>
<td>amount of water</td>
<td>basal metabolism level</td>
</tr>
<tr>
<td>muscle mass</td>
<td>biological relative age</td>
</tr>
<tr>
<td>bone mass</td>
<td>caloric intake, daily and recommended</td>
</tr>
</tbody>
</table>

*Source: Own author's elaboration*

They can measure and calculate (Table 6), show and memorize a number of important parameters of the
state of the human body; a namely: total body weight, body fat (as a percentage), percentage of internal fat, amount of water, muscle mass, bone mass, basal metabolism level, physical development rating, caloric intake (daily and recommended), biological age (relative) and others.

Considering the process of choosing devices for measuring the weight of household use by customers, it is necessary to consider for what purposes they are bought by various categories of consumers. Of course, the best is a device with additional functions that will satisfy the needs of each member of the family (but not too difficult to use and care for).

Therefore, the important characteristics are the following components: memory, on and off, user definition, calculation of normal weight, determination of fat, muscles, water in the body. Among, other parameters can be called the quality of the coating (stability, slipperiness), waterproof housing, leg adjustment, ease of movement, the size of the display (numbers) and its brightness. Convenient and functional are models with a wireless monitor, with the ability to exchange data with a personal computer or smartphone.

Consideration of the main parameters (characteristics) for comparison (consumer choice) of diagnostic scales, detailed study and generalization of various information (according to their different models), showed that all these characteristics can be broadly divided into three groups (Table 7).

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Special advantages</th>
<th>Additional custom features</th>
</tr>
</thead>
<tbody>
<tr>
<td>measurement and analysis</td>
<td>brand, manufacturer</td>
<td>memory</td>
</tr>
<tr>
<td>capabilities</td>
<td>guarantee</td>
<td>display, remote control</td>
</tr>
<tr>
<td>number of measured and calculated parameters</td>
<td>quality of platform</td>
<td>settings</td>
</tr>
<tr>
<td>calculated parameters</td>
<td>design</td>
<td>communications with smart devices, special software</td>
</tr>
</tbody>
</table>

Thus, we will take into account the following main components that influence the consumer assessment:
- the price of the device, we will consider the price segment 300 - 3000 UAH (8 – 75 EU);
- the possibility of measurement and analysis, the number of measured and calculated parameters;
- special advantages, manufacturer, brand, warranty, design, platform quality, etc.;
- additional user-friendliness, memory, display, remote, communication with smart devices, software.

**Devices offered in the market for diagnostic control of body weight.**
On the Ukrainian market of health products (in particular, technically complex devices for home use, such as diagnostic scales), the basic offers are presented in the Internet shops of a wide profile, in shops and salons of medical equipment, in drugstores and pharmacies.

Among a large number of different models and brands, we selected for the further comparative consideration several models of scales of the average price category, which are available and offered for purchase by buyers.

For some of their parameters, the integral score consists of the sum of the scores for the presence of each individual element according to Table 8.
Table 8. Scoring of separate components and parameters.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Grades</th>
<th>Extra Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>memory (for each user)</td>
<td>1-5 users</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>6-10 users</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>11-15 and more</td>
<td>3</td>
</tr>
<tr>
<td>levels of activity</td>
<td>&lt;3 levels</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>&gt;3 levels</td>
<td>2</td>
</tr>
<tr>
<td>the material of the platform</td>
<td>glass</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>glass + metal</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>metal</td>
<td>3</td>
</tr>
<tr>
<td>producing country (official)</td>
<td>Japan, Germany</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Europe, USA</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>China, others</td>
<td>1</td>
</tr>
<tr>
<td>brand, the manufacturer (reputation)</td>
<td>well known</td>
<td>1</td>
</tr>
<tr>
<td>Display additional characteristics</td>
<td>big size and numbers</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>color</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>modern design</td>
<td>1</td>
</tr>
<tr>
<td>levels according to age</td>
<td>2 and more levels</td>
<td>1</td>
</tr>
<tr>
<td>control panel (remote control)</td>
<td>multifunction, digital</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>sensor, distance</td>
<td>1</td>
</tr>
<tr>
<td>interface with digital gadgets</td>
<td>smartphone</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>computer</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>special program software</td>
<td>1</td>
</tr>
<tr>
<td>control capabilities</td>
<td>remote, distance</td>
<td>2</td>
</tr>
<tr>
<td>additional features</td>
<td>time, temperature</td>
<td>2</td>
</tr>
<tr>
<td>warranty (years)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3 and more</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Own author's elaboration

The final price, technical, operational, service, and consumer characteristics of the scales chosen for consideration are summarized and given in Table 9.

Table 9. Components for assessing consumer characteristics of diagnostic-analyzers scales.

<table>
<thead>
<tr>
<th>Model</th>
<th>Price (UA)</th>
<th>Service possibilities</th>
<th>Score</th>
<th>Advantages</th>
<th>Score</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beurer</td>
<td>1099</td>
<td>Memory 10</td>
<td>2</td>
<td>Glass</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>220</td>
<td></td>
<td>5 activity levels</td>
<td>2</td>
<td>Germany</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Size figures 40 мм</td>
<td>2</td>
<td>high Brand</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Guarantee 2 years</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Momert</td>
<td>789</td>
<td>Memory 10</td>
<td>2</td>
<td>Glass</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>5863</td>
<td></td>
<td>5 activity levels</td>
<td>2</td>
<td>Hungary</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Size figures 32 мм</td>
<td>2</td>
<td>Guarantee 1 year</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Omron</td>
<td>1608</td>
<td>Memory 4</td>
<td>1</td>
<td>Glass</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>212</td>
<td></td>
<td></td>
<td></td>
<td>Japan</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>high Brand</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Guarantee 3 years</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Sanitas</td>
<td>915</td>
<td>Memory 10</td>
<td>2</td>
<td>Germany</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>5 activity levels</td>
<td>2</td>
<td>Guarantee 2 years</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Size figures 21 мм</td>
<td>2</td>
<td>Glass</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Mani-</td>
<td>1350</td>
<td>Memory 10</td>
<td>2</td>
<td>Glass + Metal</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>quick 919</td>
<td></td>
<td></td>
<td></td>
<td>Italy</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Guarantee 1 year</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Design</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>Price</td>
<td>Memory Capacity</td>
<td>Display or Interface</td>
<td>Country</td>
<td>Warranty</td>
<td>Brand</td>
</tr>
<tr>
<td>---------------</td>
<td>--------</td>
<td>-----------------</td>
<td>----------------------</td>
<td>---------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>Terraillon</td>
<td>982</td>
<td>35 mm</td>
<td>Glass + Metal</td>
<td>France</td>
<td>1 year</td>
<td></td>
</tr>
<tr>
<td>Yunmai</td>
<td>2199</td>
<td>Memory 16</td>
<td>Glass</td>
<td>China</td>
<td>1 year</td>
<td></td>
</tr>
<tr>
<td>Polaris</td>
<td>685</td>
<td>Memory 10</td>
<td>Glass + Metal</td>
<td>France</td>
<td>1 year</td>
<td></td>
</tr>
<tr>
<td>Tanita</td>
<td>2600</td>
<td>Memory 5</td>
<td>Glass</td>
<td>China</td>
<td>3 years</td>
<td></td>
</tr>
<tr>
<td>CasoFit</td>
<td>1728</td>
<td>Memory 10</td>
<td>Glass + Metal</td>
<td>Germany</td>
<td>2 years</td>
<td></td>
</tr>
<tr>
<td>Medi-sana PSM</td>
<td>1349</td>
<td>2 age levels</td>
<td>Glass</td>
<td>Germany</td>
<td>3 years</td>
<td></td>
</tr>
<tr>
<td>BG 64</td>
<td>2392</td>
<td>5 activity levels</td>
<td>Metal</td>
<td>Germany</td>
<td>1 year</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own author's elaboration

As a result of evaluating the devices, selected for consideration, for these individual components by summing the corresponding scores, you can get some integral evaluation of the qualities of specific diagnostic scales, taking into account additional user facilities and capabilities. This generalized ball score will be used (as a separate parameter) in the further construction of the model of consumers' assessment of diagnostic scales using the theory of fuzzy sets, in the specialized module FuzzyToolBox of MatLab software.

The model for the evaluation of diagnostic scales based on a fuzzy approach.

We propose to consider (as the initial data of the evaluation according to the methodology of the fuzzy-multiple approach) the three main linguistic characteristics of the devices proposed for consideration and comparison.

This avoids the excessive complexity of the computer model. After all, the methodology for creating, testing and debugging the model remains almost the same with increasing the number of input variables. But the volume of individual rules of decision-making increases significantly with a close final accuracy of the results.

Thus, the following parameters (variables) were chosen as the main: price (300 - 3000 UAH), functions (1 - 15 main measured or calculated parameters), characteristics (5 - 20 points for aggregate evaluation of individual consumer characteristics, service capabilities, etc). Each of them can be represented by a set of three linguistic terms (price: small, medium, large, functions: limited, sufficient, exhaustive, characteristics: low, normal, high) with triangular or trapezoidal membership within specified intervals of numerical values. The
resulting linguistic evaluation (score: weak, sufficient, excellent) can also be represented by triangular membership functions with the presentation of the final result of the evaluation of each individual model of the device in the range of 1-10 points. The corresponding numerical data for building the necessary input and output membership functions are given in Table 10.

### Table 10. Numerical values for membership functions for input and output variables in the model.

<table>
<thead>
<tr>
<th>Linguistic variables</th>
<th>Linguistic terms</th>
<th>at the 0-level</th>
<th>increase from 0 to 1</th>
<th>at the 1-level</th>
<th>decrease from 1 to 0</th>
<th>at the 0-level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>small</td>
<td>-</td>
<td>-</td>
<td>300-600</td>
<td>600-1200</td>
<td>1200-3000</td>
</tr>
<tr>
<td></td>
<td>medium</td>
<td>300-600</td>
<td>600-1200</td>
<td>1200-1500</td>
<td>1500-2100</td>
<td>2100-3000</td>
</tr>
<tr>
<td></td>
<td>large</td>
<td>300-1500</td>
<td>1500-2300</td>
<td>2300-3000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Functions</td>
<td>limited</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0-5</td>
<td>5-15</td>
</tr>
<tr>
<td></td>
<td>sufficient</td>
<td>0-2</td>
<td>2-5</td>
<td>25-30</td>
<td>9-13</td>
<td>13-15</td>
</tr>
<tr>
<td></td>
<td>exhaustive</td>
<td>0-9</td>
<td>9-15</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Characteristics (5-20 points)</td>
<td>low</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1-5</td>
<td>5-10</td>
</tr>
<tr>
<td></td>
<td>normal</td>
<td>1-3</td>
<td>3-5</td>
<td>5-6</td>
<td>6-8</td>
<td>8-10</td>
</tr>
<tr>
<td></td>
<td>high</td>
<td>1-6</td>
<td>6-10</td>
<td>10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total score (level)</td>
<td>weak</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1-4</td>
<td>4-10</td>
</tr>
<tr>
<td></td>
<td>sufficient</td>
<td>1-2</td>
<td>2-5</td>
<td>5</td>
<td>5-8</td>
<td>8-10</td>
</tr>
<tr>
<td></td>
<td>excellent</td>
<td>1-6</td>
<td>6-9</td>
<td>9-10</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Own author's elaboration

The corresponding model was constructed in MatLab Fuzzy Logic Toolbox. It is understood that the proposed and reduced in the table concrete boundaries of various linguistic estimates of parameters are somewhat arbitrary (in this particular case, determined from the expert point of view). But after creating the model in the process of testing and verifying it, it can be easily changed (without destroying the model as a whole), as well as adding the necessary terms and evaluation rules for individual parameters. For all the terms of each of the three input and output variables in the program (according to the data in Table 10), corresponding membership functions are constructed, the graphical appearance of which is shown in Figure 1.

![Figure 1. Membership functions for parameters Price (UAH), Functions (points), Characteristics (points), Score (points).](image-url)
Next, needed to define and enter into the computer model all the rules of decision-making (integrated evaluation of the device with three available input parameters).

In this case, a complete search of all possible variants (combinations) of the input linguistic terms contains 27 rules (three input variables with three terms in each). It is clear that with an increase in the number of variables (input evaluation parameters) and (or) terms in them, a complete search will lead to increase in the number of rules.

An example of the interaction of rules for fuzzy inference is shown in Figure 2. The values of the input parameters are as follows: Price is 1750 UAH, Functions is 12 points (functions), Characteristics is 16 points; output parameter: Total score is 6 points.

It can be seen from the figure that depending on the specific (clear) values of the input parameters (characteristics of a concrete device), certain decision rules are working (activated). The resulting integral estimate is calculated as the coordinates of the center of mass of the figure, which is formed by summing the estimates according to individual rules (which are active for a particular set of input parameters).

Figure 2. Activating decision rules and obtaining a final estimate

Source: Author's elaboration
Additional possibilities for model analysis (its verification, adjustment, adjustment) provide visualization of so-called fuzzy logic output surfaces (Figure 3).

![Figure 3. Surfaces of fuzzy output for each two pairs of input parameters. Source: Author's elaboration](image)

Such surfaces clearly show the dependence of the resulting variable (the final estimate) on changes in two (any) input parameters. This allows you to set intervals, where even a slight change in the numerical value of the input parameter leads to a significant, sharp change in the result.

And vice versa, determine the parts of values of input parameters, where their change practically does not affect the value of the result. That is, you can determine which one and how much improvement (of one or the other) the characteristics of the device will decisively affect its overall assessment (its increase) by consumers (customers).

Concluding the description of the model, we note that it is possible to generate the corresponding program code. It can be used (built-in) into other programs (like their fragment). So the proposed model can be used for multi-stage calculations, where the described approach (to multicriteria estimation) is only part of more complex calculations.

**DISCUSSION**

The developed and presented a model for the evaluation of diagnostic scales was used to obtain a generalized estimate of several of their models. The results of the calculations are shown in Table 11.
The obtained calculated results show that the final score in points for the best model reaches only five points. Although the maximum attainable score is ten points. This can be explained, in particular, by the following reasons: overestimated prices dramatically reduce the final cumulative final assessment of models (especially expensive and multifunctional); cheap models need substantial improvement and increase in their capabilities while maintaining their price category.

The analysis of the received results (final estimations) shows that the price of the device plays an extremely important role. In conditions of a significant decrease in the purchasing power of a mass buyer in Ukraine, the minimum price becomes the main competitive advantage in a comparative choice (which is understandable and quite predictable). Therefore, in the ranking of positions from the second to the fifth occupy cheap models of diagnostic scales. And only in the first position is an expensive model. This is due to the fact that almost all models (both expensive and cheap) perform weighing and calculations for three or four basic parameters. And numerous additional service opportunities and convenience attract little to the consumer (in conditions of its limited funds). Therefore, the buyer chooses the cheapest models that provide basic measurements. The client cannot does not want, is not ready to overpay for various additional possibilities of the devices.

Only the perfection of the model, the maximum possible service options, high-quality manufacturing and excellent design, a reputable manufacturer (brand), a long-term warranty and a well-organized service can attract the consumer to more expensive models of diagnostic scales. It shows an example of a model that, with a slight overweight (only 0.3 points), came out in the first place as a result of calculations of the integrated consumer appraisal. That is, there are advantages in the market either cheap models (with functionality limited to only a few of the most basic features) or ultra-modern (advanced technically, functionally and image fully) expensive models of diagnostic scales.

To conclude the discussion, we should dwell on the limitations of both the model itself and the specific numerical results obtained. A sensitive limitation of the model as a black box is that if the ratio of importance (for the consumer) of individual criteria changes, it is necessary to make changes directly to the model itself.

The emergence of new parameters also requires adding them to the model (describing them with
corresponding membership functions, rebuilding decision-making rules), which essentially leads to the creation of a new model. Therefore, it is advisable, even at the stage of the initial development of the model, to take into account as much as possible all the possibilities of its future expansion, even to the point of introducing formal, “empty” parameters into the model, which can later be used if necessary (replaced with newly introduced additional, new actual parameters for comparison)

CONCLUSIONS
Summarizing the results of the development of the proposed model, it can be noted that the proposed approach is quite general and can be successfully applied for multi-criteria comparison of various goods, products, and also services. If the comparison uses various technical, consumer, economic parameters (expressed in different units of measurement), then fuzzy logic allows you to create calculation models where such a set of initial comparison parameters can be analyzed directly, without additional complex recalculations and transformations. This is a significant advantage of the fuzzy set approach.

Regarding the directions and suggestions for further research, possible development and way for improving the proposed initial model, it should be noted the following.

It is clear that the described model is rather simplistic, only the first step in terms of opportunities and features of practical use. Therefore, it must be experimentally tested, verified, adapted and tuned. In this direction, the following improvements are possible:

- specify the types and parameters of the membership functions for terms of linguistic variables,
- additional experimental studies (broad surveys of potential buyers and users) to confirm (if necessary, to correct) decision rules for linguistic comparison and assessment,
- to investigate the ratio of relative importance (one in relation to others) for each of evaluation criteria, because in the given model all input parameters are equally significant, which in most cases is not true,
- compare the results of computation under various fuzzy algorithms (Mamdani, Sugeno, Larsen, etc),
- to implement the relationship with Excel, which allows using the model in real conditions, directly during the comparative evaluation of various models of household diagnostic scales (by pharmacy employees, buyers and visitors, consumers when choosing these devices in a trading enterprises or on the Internet).

Using these opportunities to improve the model will provide a practical, convenient, reasonably (at the same time easy to use) computer tool for multi-criteria evaluation and selection by both specialists and ordinary customers of pharmacies, medical equipment, and health monitoring products stores, and so on.

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Informed Consent Statement: not applicable

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the ethics committee of the Simon Kuznets Kharkiv National University of Economics, approval number: 23/09-9, 30/09/2023.

Conflict of interests
The authors declare no conflict of interest.

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THE IMPACT OF ADMINISTRATIVE LEADERSHIP ON GREEN MANAGEMENT: THE CASE OF LEADERS OF SAUDI UNIVERSITIES

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ABSTRACT

Objectives: The importance of the study is to analyze the relationship between administrative leaders in Northern Border University and green management to contribute to sustainable development. The university is an integral part of society, especially in providing competencies to graduates, which can have a role in applying green management in the future and achieving sustainable development. Methods/Approach: This study will be carried out by distributing questionnaires to a random sample of leaders of Northern Border University. After that, the answers are collected and analyzed using the descriptive analytical method based on the SPSS statistical program. Results: The study results indicate an overall impact of administrative leadership at Northern Border University on green management. This impact varies between male and female leaders, with male leaders exhibiting a weakness in implementing strategic management, while female leaders need to improve in effective communication. Meanwhile, the Leader's academic qualification positively influences green management practices. Conclusions: This study adds value by examining novel connections between leadership and environmentally friendly actions by utilizing gender-specific perspectives to enhance academic sustainability.

Keywords: Administrative Leadership, Green Management, Green Economy, Northern Border University

JEL classification: M1; M29; Q20

Paper type: Research article.


INTRODUCTION

Global warming is a significant and pressing issue that the world is grappling with; according to WWF, global temperature increases directly affect human health and livelihoods. Economic losses are incurred due to drought, heat waves, sea-level rise, storms, and floods, which impact infrastructure and the agricultural and tourist industries. This situation has prompted firms and communities to place increased emphasis on and support ecologically sustainable enterprises.

Corporate economic and development efforts have both positive and negative consequences, which can result in conflicts between communities or stakeholders and companies. Saudi Arabia is not exempt from experiencing the adverse consequences of commercial activities that result in environmental degradation, such as water pollution, deforestation, and social harm. Consequently, the government should make efforts to address and restore these social and environmental concerns.

The issue of green governance has emerged as a significant concern in recent years. Society has become increasingly aware of the need to lead a healthy lifestyle, encompassing concerns such as environmental
degradation, air pollution, floods, access to clean water, and the consumption of unhealthy food. This awakening has emphasized the necessity for ecologically friendly products and services. Green management is a business practice that aims to transform inputs (such as raw materials and auxiliary resources) into outputs (such as goods and services) by emphasizing the need to achieve a harmonious and mutually beneficial relationship between economic, social, and environmental factors (Mutaminah & Sugiyanto, 2011; Mutaminah & Syiyatimah, 2012).

Consequently, it is crucial to examine green management models in Saudi Arabia, beginning with the identification of environmentally friendly resources, the implementation of eco-friendly procedures for handling raw materials (green process), the production of eco-friendly products (green outputs), the development of skills aligned with the green economy (green economy), and the enforcement of government regulations and public awareness campaigns to enhance the performance of both public and private universities. Green management is anticipated to assist universities in producing graduates who possess skills and knowledge aligned with sustainable development. Additionally, it enables universities to fulfill their social obligations to society and uphold environmental sustainability. Maximizing stakeholders’ entails that colleges generate advantages and enhance the well-being of all parties involved in society, including university leaders, faculty members, students, administrators, communities, and the environment. Moreover, the present-day global transformations have emphasized the significance of organizational leadership as a crucial element for current and future financial advancement in the green economy. This necessitates leaders dedicated to executing strategies, policies, and programs that can foster environmentally sustainable practices within their organizations and society while simultaneously striving for economic prosperity (Metcalf & Benin, 2013).

When administrative leadership is applied in the context of environment and sustainable development, it is referred to as sustainability leadership, sustainable leadership, or green leadership. This involves connecting leadership with sustainable green management methods (Cosby, 2014). Sustainable leadership, a prominent concept in the green economy, places significant emphasis on various stakeholders such as government agencies, environmental pressure groups, and organizations. This approach has become widely adopted (Avery & Bergsteiner, 2011; Elkington & Heitz, 2014; Margaretha Saragih, 2013; McCann Holt, 2012; McCann Sweet, 2014; Suriyankeetskkaew Avery, 2016). In addition, sustainability leadership has been recognized as a crucial regulatory endeavor for the effectiveness of the education process (Metcalf & Benn, 2013; Riseley, 2016). Sustainable leadership refers to the behaviors and practices that generate enduring value for all stakeholders, encompassing the environment, future generations, and society. Integrating regulatory activities and environmental consciousness combines and incorporates measures imposed by regulations with a conscious understanding and consideration of the environment (Backer, 2002). The analysis above indicates that the main priority for leadership is to concentrate on the environment, as this could give Banerjee (2002) a competitive edge. The practice of sustainable leadership by various organizations presents an opportunity for additional innovation, a successful long-term strategy, ongoing improvement, and a sustainable competitive advantage (Berchicchi et al., 2012; Fable et al., 2005; McCann & Holt, 2011; Porter & Kramer, 2011; Siegel,
2009; Slankis, 2006). According to Slankis (2006), using sustainability can drive new inventions, methodologies, or corporate procedures that aim to improve operations. Sustainable leaders are crucial in promoting green initiatives and improving environmental performance within their organizations. They are accountable for developing an environmental vision by implementing changes in corporate culture and forming partnerships with various stakeholders to address environmental concerns and accomplish environmental objectives (Bansal, 2003; Dechant & Altman, 1994).

Furthermore, "Sustained leadership entails generating both present and future financial gains for an organization while simultaneously enhancing the well-being of all individuals involved." McCann and Holt (2011). The study is flawed due to a fundamental question that arises:

What was the impact of Northern Border University leaders on green management and their contribution to sustainable development?

The study examines the correlation between management leaders in Saudi universities and green management to promote sustainable development. As universities are crucial to society, this research seeks to explore how graduates can contribute to implementing green management practices and achieving sustainable development.

This research aims to elucidate the theoretical aspects of the correlation between managerial leadership and green management. To ascertain the primary limitations that impact management leadership in executing environmentally friendly management procedures. Furthermore, the study examines measures implemented by policymakers to support sustainable development via green management.

This study aims to enhance our understanding of the relationship between administrative leadership and green management. It is organized into five sections. The structure of the research paper consists of three main sections: the introduction, the literature review and hypotheses, and the materials and methods. The fourth section, which includes the results and discussion, is regarded as the crucial component of the study. In the final section, the conclusion should address the implications, limitations, and future directions of the research and provide recommendations.

LITERATURE REVIEW AND HYPOTHESIS

Literature Review

Recent studies have indicated that sustainable leadership can enhance organizational performance by minimizing expenses and maximizing potential revenues (Ambec & Lanoie, 2008; Marcus & Freeth, 2009).

Ambec and Lanoie (2008) further identified four categories where cost reduction can be influential: risk management and external stakeholder relationships, as well as the costs associated with materials, energy, and services. III. The capital expenditure. Furthermore, there are expenses associated with hiring and retaining employees. Sustainable leadership is characterized by proactive behavior and ongoing analysis of the organization's operating environment to identify any external forces of change. This necessitates the ability of organizational leadership to establish enduring relationships with all stakeholders both within and outside the
organization. Graen and Uhl-Bien (1995) conducted a study. In terms of organizational actions, sustainable leadership typically involves the development of a long-term vision for making environmentally sustainable decisions. It also promotes the fundamental green values of sustainability, acknowledges the challenges associated with sustainability, implements green management systems, and demonstrates innovation in providing high-quality products, services, and solutions (Avery & Bergsteiner, 2011; Crossman, 2011; Maak & Pless, 2006). Nevertheless, sustainable leadership beyond the company aims to attain optimal environmental and societal performance (Avery & Bergsteiner, 2011). Organizations that embrace sustainable leadership techniques can have numerous advantages. Some examples of these practices include reducing pollution, efficiently using water and energy, utilizing renewable energy sources, managing waste from viable resources, recycling, conducting research and education, improving organizational reputation, reducing costs, and increasing productivity (Ambic & Lanoie, 2008; Jafri, 2015). Organizations worldwide face sustainability challenges that have significantly pressured higher education institutions to educate and train leaders in sustainable environmental practices (Brown et al., 2010; Scott et al., 2012). Higher education institutions function as commercial enterprises and serve as the foundation of environmental sustainability (Leach, 2008). Higher education institutions' expertise and R&D endeavors can provide valuable guidance to business organizations in formulating new strategies to incorporate the environment into their business processes, thereby attaining optimal performance in terms of business, community, and environmental aspects (Foo, 2013).

According to a study carried out by Patwary et al., 2023, they found a relationship between green inclusive leadership (GIL), green human resource management (GHRM), and proactive pro-environmental behaviour (PEB). The findings also suggested that GHRM mediates the links between GIL and proactive PEB.

The study by Özgül & Zehir (2023) examines the moderating impact of a differentiation strategy on the relationship between green transformational leadership (GTL) and competitive advantage (CA). The impact of top management's Global Talent Leadership (GTL) on the firm's Global Organizational Learning Capability (GOLC) is beneficial. Furthermore, GOLC has a good impact on the firm's CA. This study demonstrates that GTL has a substantial indirect impact on CA via GOLC.

The study conducted by Niazi et al. (2023) revealed that green human resource management (GHRM) and green innovation (GI) had a beneficial influence on green corporate social responsibility (GCSR). Although the correlation between GHRM and environmental performance (EP) was negligible, GI substantially impacted environmental performance. Moreover, GCSR benefited EP, supporting its position as a mediator between GHRM, GI, and EP.

Hypothesis

In order to respond to the problem of research and to achieve its desired objectives, we propose a series of hypotheses, as follows:

H1: Clear Communication and Adaptability have a positive impact on green management.
H2: Visionary Strategic Planning has a positive impact on green management.
H3: Ethical Decision-making and Fostering a Positive Organizational Culture positively impact green management.
H4: Team Collaboration and Continuous Learning positively impact green management.
H5: Leadership practices consistent with green management differ between men and women at Northern Border University.
H6: Leadership practices that align with green management vary between leadership positions at NBU.
H7: Leadership management practices that align with green management vary between different academic qualifications at Northern Border University.

MATERIALS AND METHODS

Data
Sample Selection
The leadership of Northern Border University approved a sample.
Sources of Data
One hundred forty-two leaders answered a questionnaire prepared to test hypotheses based on the model of study.
Tools used in the study
This study is based on a theoretical model linking management leadership to green management by examining the determinants of managerial leadership, which in turn contribute to the application of green management, and by finding out whether there are differences in age, Gender, Administrative position, or Academic position in its application from Northern Border university in Saudi Arabia.
Study Model
Measures
The analogy was derived from a questionnaire on administrative leadership at Northern Borders University in Saudi Arabia. The questionnaire was distributed to 142 leaders, 77 males and 65 females. The responses received were varied. The user has presented a set of questions categorized into five sections: Clear Communication and Adaptability (CCA), Visionary Strategic Planning (VSP), Ethical Decision-making and Fostering a Positive Organizational Culture (EDFPOC), Team Collaboration and Continuous Learning (TCCL), and Green Management (GM), as illustrated in Figure 1. A Likert scale ranging from "Strongly Agree" to "Strongly Disagree" assessed all construction aspects.

The empirical section should provide appropriate citations to the methodology used. Paper's argument should be built on an appropriate base of theory, concepts, or other ideas. The research or equivalent intellectual work on which the paper is based should be well designed. Methods employed should be appropriate.
Descriptive Analysis

The questionnaire was distributed to a group of administrators at Northern Border University who hold leadership positions. The responses were collected from 142 leaders, and it was found that 95% of them practice leadership in alignment with sustainable management principles. The results are displayed in Table 1.

<table>
<thead>
<tr>
<th>Table 1. Respondents Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristic</td>
</tr>
<tr>
<td>Gender :</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Age :</td>
</tr>
<tr>
<td>25-30</td>
</tr>
<tr>
<td>31-35</td>
</tr>
<tr>
<td>36-40</td>
</tr>
<tr>
<td>41-45</td>
</tr>
<tr>
<td>46-50</td>
</tr>
<tr>
<td>50+</td>
</tr>
</tbody>
</table>

Figure 1. Model of Relationship between Administrative Leadership and Green Management
Measurement Model Analysis

Validity and Reliability

The Cronbach's Alpha coefficient is employed to assess the internal consistency of any structure. The Alpha Cronbach values, measured using the recommended 0.60 thresholds (Fornell & Larcker, 1981), ranged from 0.66 to 0.94 for all constructs. These values, as presented in Table 2, indicate that the elements within each underlying structure demonstrate internal solid consistency.

The study yielded a Cronbach's Alpha value of 0.817 (<0.94) on a global scale, indicating that the data is acceptable and reliable. This high level of reliability enhances the likelihood of obtaining accurate and favorable outcomes.

Table 2. Reliability Questionnaire Test

<table>
<thead>
<tr>
<th>N</th>
<th>Cronbach's Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>0.817</td>
</tr>
</tbody>
</table>

Source: Secondary Data, Data analyzed using SPSS.

Descriptive Statistics

Furthermore, it is universally acceptable across all research variables, as evidenced by the data presented in Table 3.

Table 3. Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Sd.dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0</td>
<td>1</td>
<td>0.5422</td>
<td>0.4999</td>
</tr>
<tr>
<td>CCA</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>0.9893</td>
</tr>
<tr>
<td>VSP</td>
<td>1</td>
<td>5</td>
<td>4.0704</td>
<td>0.9795</td>
</tr>
<tr>
<td>EDFPOC</td>
<td>1</td>
<td>5</td>
<td>4.1338</td>
<td>0.9544</td>
</tr>
<tr>
<td>TCCL</td>
<td>1</td>
<td>5</td>
<td>3.8521</td>
<td>1.1041</td>
</tr>
<tr>
<td>GM</td>
<td>1</td>
<td>5</td>
<td>3.8802</td>
<td>0.9414</td>
</tr>
</tbody>
</table>

Note: Clear Communication and Adaptability (CCA), Visionary Strategic Planning (VSP), Ethical Decision-making and Fostering a Positive Organizational Culture (EDFPOC), Team Collaboration and Continuous Learning (TCCL), and Green Management (GM.)

Source: Output SPSS.
Additionally, it presents the mean and standard deviation for each variable. Upon gathering and organizing the data, the individual groups were consolidated into a single variable to regulate the research variables. This variable encompassed ten factors, comprising both essential variables that directly influenced the model and variables that indirectly affected it.

Table 4. Inter-item correlation matrix

<table>
<thead>
<tr>
<th></th>
<th>CCA</th>
<th>VSP</th>
<th>EDFPOC</th>
<th>TCCL</th>
<th>GM</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCA</td>
<td>1</td>
<td>0.783**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VSP</td>
<td>0.783**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDFPOC</td>
<td>0.616**</td>
<td>0.718**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCCL</td>
<td>0.351**</td>
<td>0.318**</td>
<td>0.456**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>GM</td>
<td>0.643**</td>
<td>0.674**</td>
<td>0.638**</td>
<td>0.587**</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: ** Correlation is significant at the 0.01 level

Source: Output SPSS

The correlation matrix in Table 4 indicates correlation among the variables in the model. This correlation enhances the model's accuracy, which utilizes the most accurate linear unbiased estimators.

RESULTS AND DISCUSSION

After examining the impact of leadership on green management at Northern Borders University, we conducted a survey among university leaders. The findings revealed that most of these leaders support implementing practices in their roles. However, we aim to clarify some areas based on the results concerning both male and female leaders. Additionally, we observed that the academic qualifications of these leaders also influence their approach to management while exercising their leadership responsibilities. To delve deeper into our analysis, we have divided the discussion of the research results into three sections: First, an Overall analysis; second, an analysis specifically focused on male leaders at Northern Borders University; and finally, an analysis within the category of female leaders within the same institution.

Overall analysis

In this section, the analysis of Model 01's summary, ANOVA test, and estimation coefficients yields comprehensive insights into relationships, significance, and variable dynamics.

Table 5. Summary of Model 01

<table>
<thead>
<tr>
<th>Model 01</th>
<th>R</th>
<th>R Sqr</th>
<th>Adj R Sqr</th>
<th>Std. Err</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.808*</td>
<td>0.654</td>
<td>0.641</td>
<td>0.56423</td>
</tr>
</tbody>
</table>

* Predictors: (Constant), TCCL, VSP, EDFPOC, CCA, LQ.

In Table 5, the R-value is 0.808, indicating a correlation between Clear Communication and Adaptability (CCA), Visionary Strategic Planning (VSP), Ethical Decision-making and Fostering a Positive Organizational
Culture (EDFPOC), Team Collaboration and Continuous Learning (TCCL), and Green Management (GM) in model 01.

The R squared value is 0.641, representing the proportion of variance in Green Management (GM) that can be predicted by Clear Communication and Adaptability (CCA), Visionary Strategic Planning (VSP), Ethical Decision-making, and Fostering a Positive Organizational Culture (EDFPOC), Team Collaboration and Continuous Learning (TCCL). In this case, 64% of the variation in Green Management can be accounted for by Clear Communication and Adaptability, Visionary Strategic Planning, Ethical decision-making and Fostering a Positive Organizational Culture, Team Collaboration, and Continuous Learning.

**Table 6. Test of ANOVA** of model 01

<table>
<thead>
<tr>
<th></th>
<th>Sum. Sqr</th>
<th>df</th>
<th>Mean Sqr</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>81.669</td>
<td>5</td>
<td>16.334</td>
<td>51.307</td>
<td>0.000</td>
</tr>
<tr>
<td>Residual</td>
<td>43.296</td>
<td>136</td>
<td>0.318</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>124.965</td>
<td>141</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Dependent Variable: GM.*
*b Predictors: (Constant), TCCL, VSP, EDFPOC, CCA, LQ.

Based on the analysis of Table 6, which presents the ANOVA findings for Model 01, it is evident that there is a fit. The regression model, including predictors such as Constant, TCCL, VSP, EDFPOC, and CCA, explains a portion of the variation in the variable GM. The F statistic of 51.307 and its associated p-value of 0.000 provide evidence to reject the hypothesis, indicating that at least one predictor significantly impacts GM. Examining the analysis reveals a sum of squared residuals (43.296), indicating that the model successfully captures a substantial portion of the variance. These ANOVA results confirm that Model 01 effectively explains the variability observed in GM.

**Table 7. Estimation Coefficients** of model 01

<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Err</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>Model 01</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>-0.194</td>
<td>0.274</td>
<td>-</td>
<td>-0.706</td>
</tr>
<tr>
<td>CCA</td>
<td>0.173</td>
<td>0.079</td>
<td>0.182</td>
<td>2.200</td>
</tr>
<tr>
<td>VSP</td>
<td>0.298</td>
<td>0.090</td>
<td>0.310</td>
<td>3.333</td>
</tr>
<tr>
<td>EDFPOC</td>
<td>0.149</td>
<td>0.077</td>
<td>0.152</td>
<td>1.945</td>
</tr>
<tr>
<td>TCCL</td>
<td>0.327</td>
<td>0.049</td>
<td>0.383</td>
<td>6.634</td>
</tr>
<tr>
<td>Leader Qualification</td>
<td>0.196</td>
<td>0.065</td>
<td>0.157</td>
<td>3.036</td>
</tr>
</tbody>
</table>

*Dependent Variable: GM

\[
GM_i = -0.194 + 0.173 \times CCA_i + 0.298 \times VSP_i + 0.149 \times EDFPOC_i + 0.327 \times TCCL_i + 0.196 \times LQ_i
\]  
(1)

171
Equation (1) represents the regression model 01 for GM, where the intercept is 0.207. The coefficients for CCA, VSP, EDFPOC, TCCL, and Leader Qualification (LQ) are 0.173, 0.298, 0.149, 0.327, and 0.196, respectively. Each coefficient indicates how much GM changes when the corresponding predictor changes by one unit while keeping predictors constant. The standard errors in parentheses (0.482, 0.029, 0.001, 0.054, 0.000, and 0.003) show how precise the coefficient estimates are. Notably, the p values associated with each help determine their significance; smaller p values (<0.05) indicate predictors.

Based on the analysis, it was found that the factors of Clear Communication and Adaptability (CCA), Visionary Strategic Planning (VSP), and Team Collaboration and Continuous Learning (TCCL) have an impact on Green Management (GM). To be more specific, a 1 percent increase in CCA leads to a 0.17 percent increase in GM, supporting hypothesis H1. Similarly, a 1 percent increase in VSP results in a 0.31 percent rise in GM, supporting hypothesis H2. An increase of 1 percent in EDFPOC corresponds to a 0.15 percent increase in GM, providing evidence for hypothesis H3. Additionally, an increase of 1 percent in TCCL corresponds to a 0.3 percent increase in GM, providing evidence for hypothesis H4.

However, the variable Leader Qualification (LQ) also positively impacts Green Management (GM); an increase of 1 percent in LQ corresponds to a 0.2 percent increase in GM, providing evidence for hypotheses H6 and H7.

Analysis of Male Leaders

According to the results of regression analysis presented in Table 8, we can see the coefficients, standardized coefficients (Beta values), t values (T), and significance levels (Sig.) for the model and its predictor variables. The predicted variable is GM (likely referring to General Management), while the variables used as predictors are CCA, VSP, EDFPOC, TCCL, and LQ. It is important to note that this analysis only includes cases where the Leader's gender is male. In summary, CCA, TCCL, and LQ appear to have effects on GM as predictors, while VSP and EDFPOC do not show significant effects. However, it is essential to interpret these findings as significance levels should be considered along with factors like the study context and sample size.

Table 8. Estimation Coefficients a,b of model 02

<table>
<thead>
<tr>
<th>Model 02</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>-0.442</td>
<td>-</td>
<td>-1.164</td>
<td>0.248</td>
</tr>
<tr>
<td>CCA</td>
<td>0.337</td>
<td>0.349</td>
<td>3.021</td>
<td>0.004</td>
</tr>
<tr>
<td>VSP</td>
<td>0.215</td>
<td>0.223</td>
<td>1.719</td>
<td>0.090</td>
</tr>
<tr>
<td>EDFPOC</td>
<td>0.053</td>
<td>0.052</td>
<td>0.490</td>
<td>0.625</td>
</tr>
<tr>
<td>TCCL</td>
<td>0.395</td>
<td>0.448</td>
<td>5.821</td>
<td>0.000</td>
</tr>
<tr>
<td>LQ</td>
<td>0.276</td>
<td>0.218</td>
<td>3.170</td>
<td>0.002</td>
</tr>
</tbody>
</table>

a Dependent Variable: GM.
b Selecting only cases for which Leader Gender = Male
Based on Equation 2, we can determine that the model is suitable for the sample involving the category. Effective communication, collaboration, continuous learning, and the academic qualifications of the Leader hold significant impact. This implies that a 1% increase in communication leads to a 0.33% advancement in management. Similarly, a 1% increase in efforts and continuous learning yields a 0.4% improvement in management. Moreover, a 1% increase in the Leader's academic qualifications results in a 0.3% enhancement in management. This confirms the hypothesis H5.

Nevertheless, strategic planning, ethical decision-making, and fostering a culture do not influence green management among male leaders at Northern Borders University. This is because strategic planning, ethical decision-making processes, and promotion of culture are centrally executed by the university's top Leader - the university director-based on directives from the ministry.

Analysis of Female Leaders

Table 9 shows results for female leaders; VSP, EDFPOC, and TCCL are significant predictors of GM, while CCA and LQ do not show statistically significant effects. These interpretations are based on the provided coefficients, standardized coefficients, and significance levels. Remember that significance levels should be interpreted cautiously, and other contextual factors should also be considered.

Table 9. Estimation Coefficients of model 01

<table>
<thead>
<tr>
<th>Model 03</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Err</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>0.113</td>
<td>0.383</td>
<td>0.294</td>
<td>0.770</td>
</tr>
<tr>
<td>CCA</td>
<td>0.028</td>
<td>0.113</td>
<td>0.030</td>
<td>0.248</td>
</tr>
<tr>
<td>VSP</td>
<td>0.376</td>
<td>0.126</td>
<td>0.391</td>
<td>0.2986</td>
</tr>
<tr>
<td>EDFPOC</td>
<td>0.231</td>
<td>0.110</td>
<td>0.249</td>
<td>2.110</td>
</tr>
<tr>
<td>TCCL</td>
<td>0.261</td>
<td>0.074</td>
<td>0.323</td>
<td>3.510</td>
</tr>
<tr>
<td>LQ</td>
<td>0.081</td>
<td>0.097</td>
<td>0.065</td>
<td>0.836</td>
</tr>
</tbody>
</table>

a Dependent Variable: GM.
b Selecting only cases for which Leader Gender = Female

Based on Equation 3, we can determine that the model is deemed acceptable when applied to the sample that includes the category. The analysis reveals that collaborative efforts, continuous learning, strategic planning, ethical decision-making, and promoting a culture hold statistical significance and meaningful implications. This indicates that a 1% increase in efforts and continuous learning leads to a 0.4% improvement
in management. Similarly, a 1% increase in planning results in a 0.25% improvement, while a 1% increase in decision-making and promoting a positive organizational culture leads to a 0.3% improvement in green management. This confirms the hypothesis \text{H5}.

However, practical communication skills and the academic qualifications of leaders at Northern Borders University do not appear to impact management. This lack of influence can be attributed to these leaders needing to adopt an open-door policy.

Its purpose is to present the new information gained in the study being reported. Results should be presented clearly and analysed appropriately. The Results are core of the paper. You shouldn’t start the Results section by describing methods that you inadvertently omitted from the Materials and Methods section.

\textbf{CONCLUSION}

The study investigating the influence of administrative leadership on green management, specifically examining leaders at Northern Border University, has revealed significant insights into administrative leadership and green management. The study findings suggest that Northern Border University's administrative leadership significantly influences green management. The impact of gender on leadership differs, as male leaders tend to struggle with adopting strategic management, while female leaders face challenges in effective communication. Simultaneously, the Leader's academic credentials benefit the implementation of environmentally friendly management techniques. The study emphasizes the critical role of leadership in promoting sustainable practices inside an academic institution. The research has demonstrated that the indicated leadership skills or techniques directly impact the implementation and success of green management projects.

Moreover, the results indicate that a forward-thinking and ecologically aware administrative leadership can be a driving force for beneficial transformation within the university and the broader society. The case study on Northern Border University offers significant insights into the obstacles and prospects leaders encounter in advancing sustainability and environmentally conscious practices.

As organizations globally increasingly acknowledge the significance of environmental accountability, the ramifications of this research go beyond the academic domain. The findings emphasize the need for universities and similar organizations to prioritize implementing environmentally friendly practices. They also highlight the role of strong leadership in driving and maintaining such programs.

The study contributes substantially to comprehending the connection between administrative leadership and green management. However, there are opportunities for future research to explore more topics in greater detail. In summary, this research contributes to the expanding knowledge base on sustainability in higher education and offers practical consequences for administrators aiming to improve their institutions' environmentally friendly efforts.

\textit{Recommendation:} Through the results of this study, we can provide a set of recommendations, which we mention as follows:
- Leadership Training Programs via developing leadership training to enhance strategic and communication skills.
- Gender-Inclusive Leadership Workshops via conduct workshops addressing gender-specific leadership challenges for sustainable practices.
- Communication Enhancement Initiatives via implementing communication improvement programs for female leaders in green initiatives.
- Strategic Management Enhancement offers training programs to strengthen strategic management skills among male leaders.
- Academic Qualification Support via encouraging continuous academic development to bolster green management practices.
- Diversity and Inclusion Policies via advocating for gender-inclusive policies to foster diverse leadership styles.
- Longitudinal studies will be conducted via longitudinal studies to monitor changes in green management over time.

The multi-method Research Approach utilizes diverse research methods to enrich understanding leadership dynamics.
- Collaborative Initiatives encourage collaborative efforts among leaders for collective sustainability goals.
- Feedback Mechanisms establish feedback mechanisms to assess and improve green practices continuously.

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Conceptualization, H.A. and L.B.; methodology, H.A.; software, B.L.; validation, J.B., M.T. and B.L.; formal analysis, J.B.; investigation, B.L.; resources, M.T.; data curation, H.A.; writing—original draft preparation, J.B.; writing—review and editing, B.L.; visualization, H.A.; supervision, B.L.; project administration, H.A.; funding acquisition, H.A. All authors have read and agreed to the published version of the manuscript.”

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