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# SUSTAINABLE DEVELOPMENT AS A MEASURE OF MODERN BUSINESS SUCCESS



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Singidunum University International Scientific Conference

# SUSTAINABLE DEVELOPMENT AS A MEASURE OF MODERN BUSINESS SUCCESS

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Lidija Barjaktarović

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Goranka Knežević

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### Contact us

Singidunum University  
32 Danijelova Street, Belgrade, 11010  
Belgrade, Serbia  
Phone. +381 11 3093220, +381 11 3093284  
Fax. +381 11 3093294  
E-mail: [finiz@singidunum.ac.rs](mailto:finiz@singidunum.ac.rs)  
Web: <https://finiz.singidunum.ac.rs/en/>

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## ABOUT FINIZ 2023 CONFERENCE

It is our great pleasure to introduce the proceedings of the International Scientific Conference FINIZ 2023, which is live at Singidunum University on 7 December 2023. Considering colossal geopolitical, ecological, and business changes in the world, the main topic of this year's conference is: **"Sustainable development as a measure of modern business success"**.

The concept of sustainable development nowadays is made of economic, social and environmental pillars that meet the needs of current and future business success. This has become of paramount importance to guide business decisions at all levels of organizations in the current knowledge economy.

The following sections outline how papers contribute to the application of the "Sustainable development as a measure of modern business success" by thematic areas of conference (accounting, corporate governance, evaluation and risk, banking, business finance, corporate finance, circular economy, marketing and management, and human resource management).

The international scientific conference FINIZ 2023 is an ideal opportunity for all its participants to present their work and results to the general public and exchange experiences and ideas with other distinguished experts from relevant fields. Four papers, in the expanded form (30%), will be selected and proposed for publication in *The European Journal of Applied Economics* (M51) in an accelerated procedure. In addition, three papers present the results of the research projects:

- COST CA 19130 - Fintech and Artificial Intelligence in Finance – Towards a transparent financial industry
- ORCA-LAB - All-Optical Reservoir Computer Architecture based on Laser Bistability
- The project sponsored by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Grant No. 0801-417/1).

Moreover, one special session at the conference will be related to projects: ORCA-LAB - All-Optical Reservoir Computer Architecture based on Laser Bistability and COST CA 19130 - Fintech and Artificial Intelligence in Finance – Towards a transparent financial industry.



All the accepted papers have undergone a thorough review process, performed by the reputable members of the Conference Organizing and Scientific Committee.

The overall statistical data on the conference are as follows:

- The total number of submitted papers/abstracts: 29
- The total number of full papers submitted: 24
- The total number of accepted papers: 22
- The total number of rejected papers: 0
- The total number of withdrawn papers: 2

The number of papers according to their related field:

- Accounting: 3
- Corporate Governance: 2
- Evaluation and Risk: 1
- Banking: 2
- Business finance: 1
- Corporate finance: 1
- Circular Economy: 2
- Marketing and Management: 4
- Human Resource Management: 6

The total of 55 authors from 13 countries has taken part in this year's conference. The number of authors according to their country of origin: Abu Dhabi: 1, Croatia: 1, England: 1, Germany: 3, India: 1, Lithuania: 1, Montenegro: 1, Oman: 1, Poland: 4, Serbia: 39, Slovakia: 1, UAE: 1.

All the accepted papers are published on the Conference portal. Each paper is assigned its DOI number, a reference on Google Scholar, and the Conference Proceedings have an ISBN number.

**Organizing Committee of the  
International Scientific Conference FINIZ 2023**





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## INVITED PAPERS





## INVITED PAPERS

There are 4 invited papers in the areas of Accounting (2), Banking (1), and Evaluation and Risk (1). The first invited paper in the fields of accounting titled *Gender in modern accounting and model valuation – Polish perspective* aims to explore the role of gender in accounting on liabilities valuation and earnings management. The authors assumed that such a relationship exists, and women prefer less risky valuation methods. The method of analysis of sources, deductive reasoning and survey research were used. The study used a questionnaire addressed to Polish accountants. The results confirmed that accounting women prefer less risky liabilities valuation methods. Women recommend historical cost valuation less often than men. The main restriction concerns that the quantitative study was preliminary and refers only to Polish accountants. The obtained results are the basis for further research in showing the relationship between gender in modern accounting (reliability of reporting information, simplifications in accounting, tax aspects). The findings fill the research gap in preferable valuation methods regarding the gender of the person responsible for accounting. The authors remark that the accountant's role in the modern economy has changed from bookkeeper to person providing information.

The second invited paper in the field of banking titled *Measuring of banking system resilience by using the Texas ratio* notes that the issue of banking sector resilience is one of the most exploited after global financial crisis. The authors emphasize that competent authorities and central banks worldwide conducted series of actions to strengthen their systems and made it more resilient on extraordinary events. For that purpose, stress tests were conducted leading to results for improvement of central bank's supervisory activities and practices. The authors suggest that the analysis of banking sector resilience should be complemented with other measures, which are also treated as early warning indicators. Texas ratio is one of the early warning indicators that could indicate the banking system stability through the analysis of non-performing loans as portion of "toxic" assets in banks. High level of non-performing loans represents a huge threat for survival of banking systems, so their monitoring and efficient resolution is imperative. In paper, the authors emphasize the significance of Texas ratio usage in the process of banking sector resilience evaluation.

The third invited paper in the field of accounting titled *Balancing hospitality and reporting: Analyzing the impact of IFRS 16 in the hotel industry* focuses on the notion that the International Accounting Standards Board unveiled IFRS 16 - Leases in January 2016, replacing IAS 17 - Leases for reporting periods commencing on or after 1<sup>st</sup> January 2019. The authors note that the updated regulations introduce dissimilar accounting models for lessees and lessors. Although the significance of distinguishing between finance leases and operating leases has diminished for lessees, it still holds relevance for lessors. The authors claim that the influence of IFRS 16 on a company is contingent on the quantity of existing operating lease agreements and differs across various industries. The main emphasis of the paper is on the effect of the implementation of this standard in the hotel industry, as one of the industries with the highest amounts of leased assets. The paper provides the extensive literature review in which the main challenges and consequences of this standard's implementation is analyzed.

The fourth invited paper in the field of evaluation and risk titled *Saudi Crude Oil and the GCC Stock Markets: Effect of Covid-19 Outbreak?* aims to explore the dynamic connections between Saudi crude oil prices and GCC (Gulf Cooperation Council) equity markets during the COVID-19 outbreak. To represent the Saudi oil market, the authors utilize the Saudi Aramco share price, while the equity markets of GCC economies are approximated using the DFM General Equity, MSCI Qatar Equity, Kuwait Main Market 50, MSCI Oman Equity, and Bahrain All Share Equity indices, respectively. The data used in the analysis spans from December 31, 2019, to July 31, 2022. The empirical findings indicate that there is no discernible relationship between Saudi crude oil and the Bahrain equity market, both in the short and long term. However, for the other markets examined, the authors observe a mix of linkages in both the short and long run. Furthermore, the paper reveals that the Oman stock market exhibits the most significant influence on the observed dynamics, while the Bahrain equity market appears to be the most responsive to external shocks.



# GENDER IN MODERN ACCOUNTING AND MODEL VALUATION – POLISH PERSPECTIVE

Piotr Luty\*,  
Katarzyna Piotrowska,  
Angelika Kaczmarczyk,  
Dominika Florek-Sapkowska

Wroclaw University of Economics  
and Business,  
Wroclaw, Poland

## Abstract:

**Aim:** The paper aims to find out the role of gender in accounting on liabilities valuation and earnings management. The sample consists of Polish accountants with various practical experiences. The authors assumed that such a relationship exists and women prefer less risky valuation methods. The method of analysis of sources (literature), deductive reasoning and survey research were used. The study used a questionnaire addressed to Polish accountants. The results confirmed that accounting women prefer less risky liabilities valuation methods. Women recommend historical cost valuation less often than men. The main restriction concerns that the quantitative study was preliminary and refers only to Polish accountants. The obtained results are the basis for further research in showing the relationship between gender in modern accounting (reliability of reporting information, simplifications in accounting, tax aspects). The article fills the research gap in preferable valuation methods regarding the gender of the person responsible for accounting. The accountant's role in the modern economy has changed from bookkeeper to person providing information.

## Keywords:

accounting, gender, earnings management, valuation.

## 1. INTRODUCTION

Even though we have equal rights and access to learning and practicing the accounting profession in Poland, the literature indicates a strong feminisation of the accounting profession (Kabalski, 2021)—more women than men work as accountants. The reasons for this situation can be found in gender stereotypes or cultural conditions (Kabalski & Szwajcar, 2015). Accounting is a crucial element of running a business. Based on the information prepared by accounting, mandatory tax settlements and assessment of the business activity are possible. Without accounting, it would not be possible to make development decisions. Accounting is a language of communication that provides information to a wide range of stakeholders, from investors through financial institutions and contractors, public administration, and employees. Strict compliance with accounting principles and procedures guarantees the creation of reliable and useful financial information. Despite the standardisation of accounting principles, accountants can make individual decisions (in terms of accounting policy) tailored to companies' needs and operating conditions. It may include, within the limits permitted by law, the use of simplifications or the selection of detailed valuation methods for assets or liabilities. For example, in Polish accounting regulations, you can choose one of two methods for valuing financial liabilities: the historical cost method and the amortised cost method. The literature indicates that women participating in the audit process reduce the impact of earnings management on companies' financial data (Ittonen et al., 2013). It can be expected that a lower impact of earnings management will characterise companies audited by women and, therefore, a higher quality of financial statements.

Correspondence:  
Piotr Luty

e-mail:  
piotr.luty@ue.wroc.pl



Additionally, it was noticed that increasing the share of women in management bodies of companies reduces the negative association of earnings management (Gavious et al., 2012). It can, therefore, be concluded that women's accounting is characterised by better compliance with legal regulations and a lower tendency to take risks in collecting, processing and reporting financial data. The paper aims to find out the role of gender in accounting on valuation and earnings management. The sample consists of Polish accountants with various practical experiences. The authors assumed that such a relationship exists and women prefer less risky valuation methods.

## 2. LITERATURE REVIEW

Valuation in accounting shapes the quality of reporting information, influencing financial decisions by a wide range of stakeholders. Assets and liabilities are valued based on one of two models: the historical cost model or the value model based on market measures. Historically, the oldest model is pricing based on historical cost. For many years, historical cost was considered the best valuation method. In the light of this method, assets are valued at the prices (costs) incurred for their acquisition or production. Historical cost valuation is firmly rooted in professional discourse (Maroun & van Zijl, 2022). However, in recent years, fair value measurement has steadily increased (Baudot, 2018; Benston, 2006; Georgiou, 2018; Hitz, 2007). Since 1980, the U.S. Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IAS) have systematically replaced historical cost methods with market-based measures, initially mainly for the valuation of financial instruments and non-financial items. The reporting model based on historical cost is losing importance in favour of the market value model (Hitz, 2007). According to some authors, fair value provides users with important information that faithfully reflects the economic essence of the transaction (Georgiou, 2018; Whittington, 2008). The fair value paradigm is based on the decision utility paradigm, established as an official goal of standard setting (Hitz, 2007).

The historical cost is undoubtedly a valuation that ensures higher security in economic transactions. The valuation based on historical cost does not include unrealised profits, and there is no possibility of revaluation above the purchase price. Lenders, therefore, believe that this valuation better protects their interests. In turn, the concept of historical cost is criticised by investors who accuse it of lacking information about the current value of resources. The longer the time horizon, the less useful information about the historical cost of assets is. From the point of view of investor decisions, the concept of historical cost is of little use. The main advantages of valuation based on fair value include the fact that it considers market expecta-

tions regarding future cash flows. Its main disadvantage is the questionable measurement reliability, especially in the case of estimates based on management expectations and forecasts (Hitz, 2007). Fair value estimation is based on a three-step hierarchy:

1. Valuation at market prices - best estimate of fair value.
2. Inclusion of modified market prices for comparable items.
3. Estimation (Hitz, 2007).

Measurement by estimation is perceived as the most significant disadvantage of fair value measurement. Valuation pays special attention to its functioning in conditions of economic crisis. The advantages and disadvantages of both valuation methods then look different. Of course, there is no clear position on which approach better reflects reality in crisis conditions, but specific hypotheses put forward by the authors can be analysed. The first hypothesis assumes that fair value is more important for value than historical cost in a period of increased macroeconomic uncertainty. It is more transparent and up-to-date, allowing for more effective decisions and better reflecting current risks (Liao et al., 2021). The transparency and timeliness of decisions are often emphasised in the literature on the subject (Penman, 2007), and the historical cost only presents past conditions (Laux & Leuz, 2009). The significant role of fair value when valuing investments for financial reporting purposes is emphasised. Fair value can help alleviate the information problem by capturing and reflecting current market conditions.

The second hypothesis assumes that historical cost is more appropriate during an economic crisis because fair value is unreliable and more susceptible to managerial manipulation. Particularly in times of macroeconomic uncertainty, estimating fair value may become difficult. Bhat notes that fair value's usefulness is limited because markets are illiquid and stressed (Bhat et al., 2011). Benston points to the example of Enron, which used estimates to value its energy contracts. Fair value is mainly responsible for the company's failure (Benston, 2006). As can be seen, fair value is primarily criticised for the method of determining it based on estimates. Valuation at market prices or modified market prices is better perceived.

In the context of the gender of accountants, the following questions were asked in the survey:

- For the valuation of financial liabilities, I recommend the amortised cost method.
- In my practice, I value financial liabilities at the adjusted purchase price.
- In a situation where the entity is threatened with bankruptcy, I recommend neutralising the decline in financial results (within the limits of the law).



- If the entity is threatened with bankruptcy, I (and would) neutralise, within the limits of the law, the decline in financial results.

The answers will allow to assess the preferred valuation principles regarding fair values and historical cost.

### 3. METHODOLOGY

The research problem can be formulated as a synthetic question: does the gender of people practicing accounting influence their approach to valuation? The study was conducted from September to November 2022. Members of the Association of Accountants in Poland (AAP) were invited to participate in the study. The research survey was sent by e-mail to AAP members. 63 members of the Association of Accountants in Poland took part. 48 respondents were women, and 15 were men. The next group of respondents included people dealing with accounting and associated with Facebook groups. 23 people responded to the link to the survey, 18 of whom were women and 5 were men. Figure 1 presents the research sample grouped by gender.

Based on the answers obtained, it can be concluded that the accounting community is highly feminised. The survey includes questions about the respondents' experience in accounting positions. It will enable comparison of answers among people with extensive professional experience (over ten years) and people starting work in accounting (less than ten years). The questions in the survey were divided into two groups. The first group consisted of questions relating to the knowledge and recommendations of accountants. The second group of questions concerned the practical application of valuation methods.

### 4. RESULTS AND DISCUSSION

To examine the impact of gender on the tendency of accountants to manipulate results, they were asked in the survey to respond to the following statement: I recommend using the amortised cost method for financial liabilities valuation. Respondents could answer the following: 1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – strongly agree. The survey results were divided into two groups: accountants with short professional experience (up to 10 years) and accountants with long professional experience (over 10 years).

Figure 2 shows the answers of respondents who have been employed in accounting for up to 10 years.

Figure 2 shows that, regardless of gender, most accountants recommend using the amortised cost method for valuing liabilities. The study also examined the practical application of valuation methods. In the group of accountants with up to 10 years of experience, most women and men answered that they only sometimes use the amortised cost method (Figure 3).

In the group of more experienced accountants (over ten years), more men recommend using the amortised accounting cost method (Figure 4). It can be concluded that women would recommend a more cautious, historical cost approach.

**Figure 1.** Recommendation amortised cost method, accountants with less than ten years of experience.

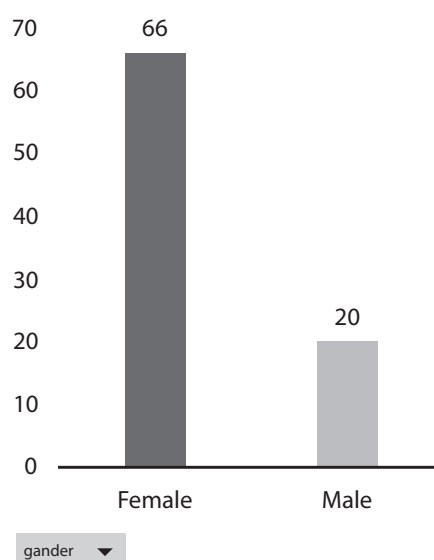






Figure 2. Recommendation amortised cost method, accountants with less than ten years of experience.

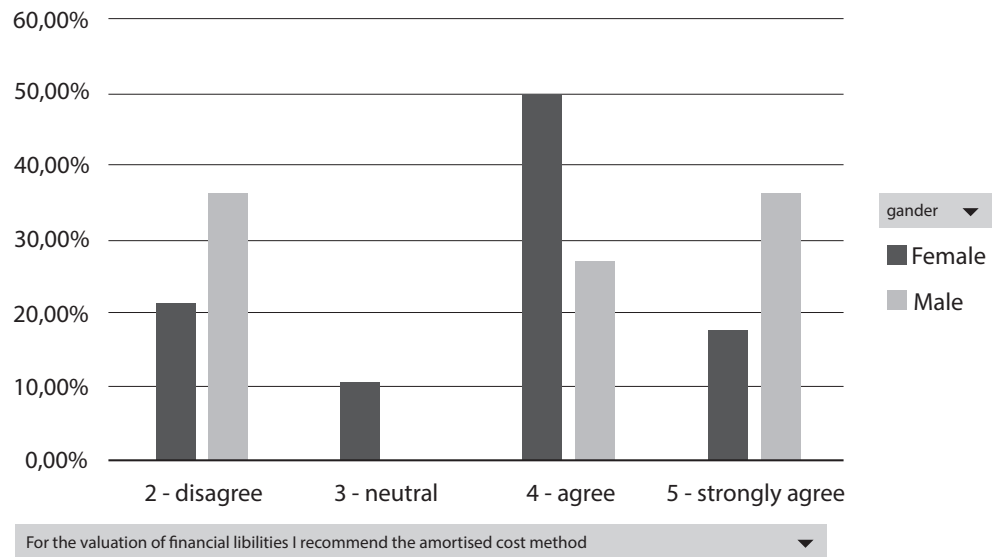


Figure 3. Amortised cost method in practice, accountants with less than ten years of experience.

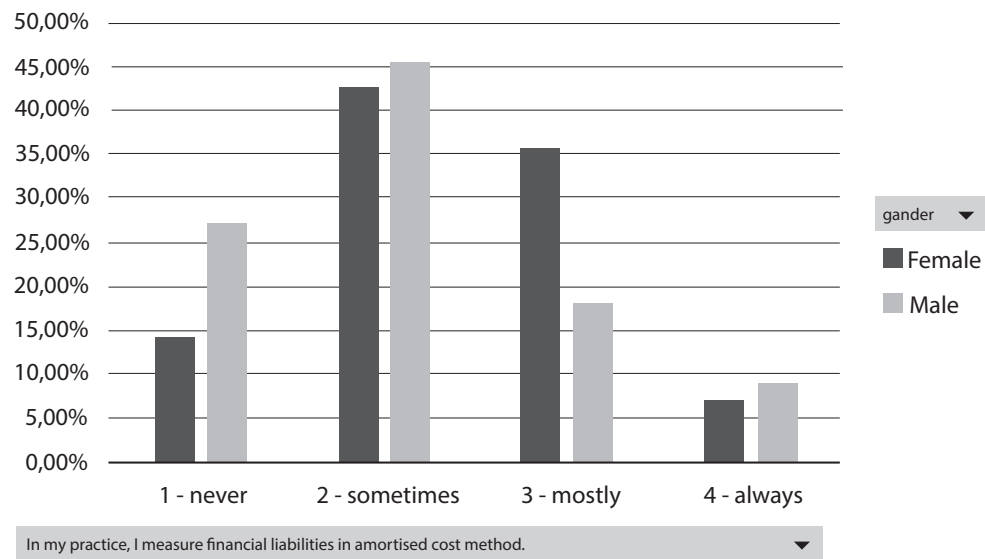
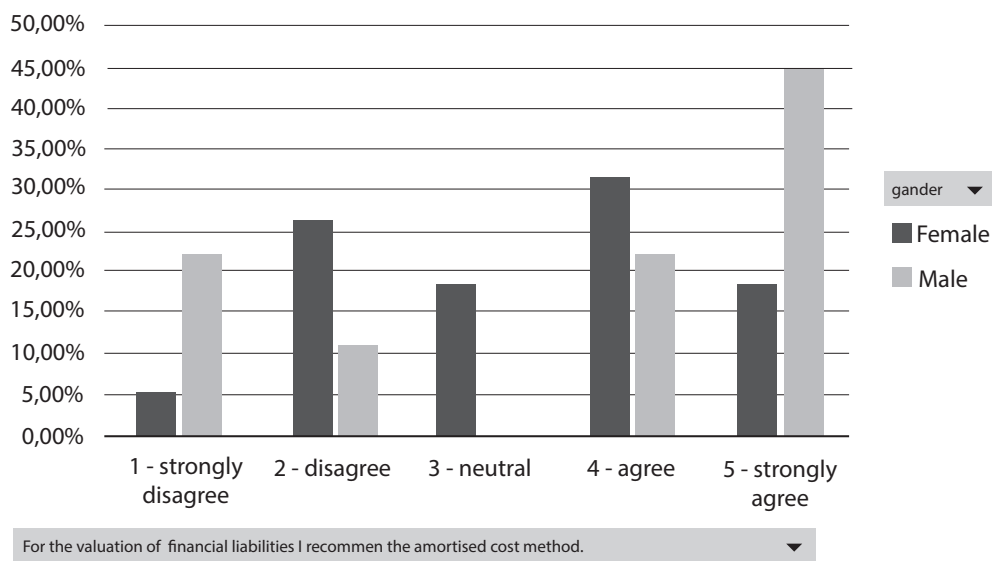


Figure 4. Recommendation amortised cost method, accountants with more than ten years of experience.





Although most men recommend using the amortised cost method, only a few use it in practice (Figure 5). In the case of women, most answers indicated a neutral or negative attitude towards it. The accounting practice of women confirmed their recommendation (Figure 5).

An interesting observation from Figures 2 and 4 is that men did not choose the 3-neutral answer. It can be concluded that in their views on valuation, they were either supporters or opponents of the amortised cost method. The second question concerned the accountants' approach to earnings management when the company's continued operation is at risk. Respondents were asked to answer whether, if the entity were threatened with bankruptcy, they would recommend neutralising, within the limits of the law, the decline in financial results.

Figure 6 shows the results for accounting department employees for up to 10 years.

Based on Figure 6, it can be concluded that most men agree with earnings management in corporate crises. In the

case of women, the majority do not agree with earnings management or are neutral. Figure 7 presents the responses of accountants with up to 10 years of experience regarding the practical application of earnings management.

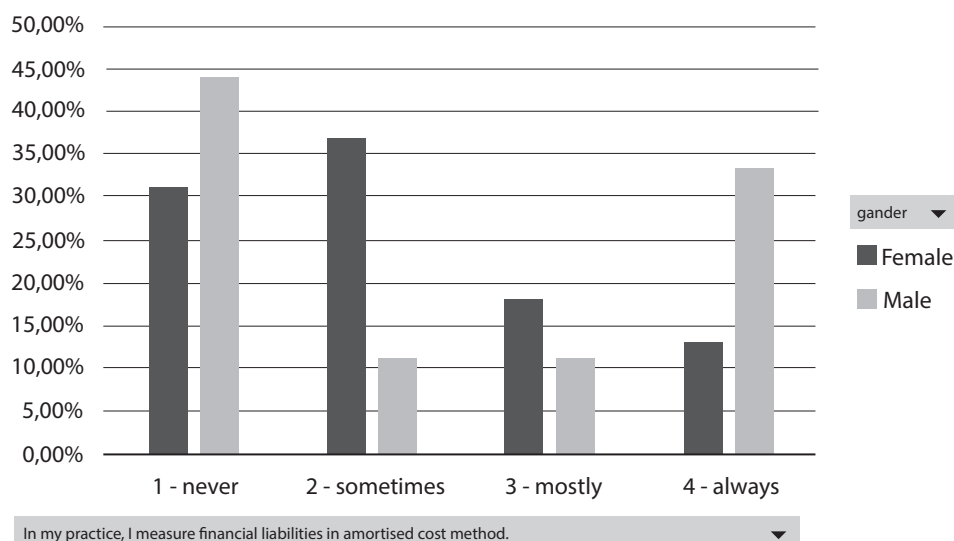
Based on Figure 7, it can be concluded that although most men recommend earnings management, their practice indicates that they have never done it or only do it sometimes. Most women never or only sometimes manage earnings (Figure 7), which is consistent with their beliefs (Figure 6).

In the case of accountants with professional experience of over ten years, the answers regarding recommending earnings management are presented in Figure 8.

Figure 9 presents responses regarding earnings management practices in a group of long-time accountants.

Most women and men with professional experience of over ten years do not recommend earnings management, or their approach is neutral (Figure 8). Their practice in this area confirms this observation (Figure 9).

**Figure 5.** Amortised cost method in practice, accountants with more than ten years of experience.



**Figure 6.** Earnings management recommendation, accountants with less than ten years of experience.

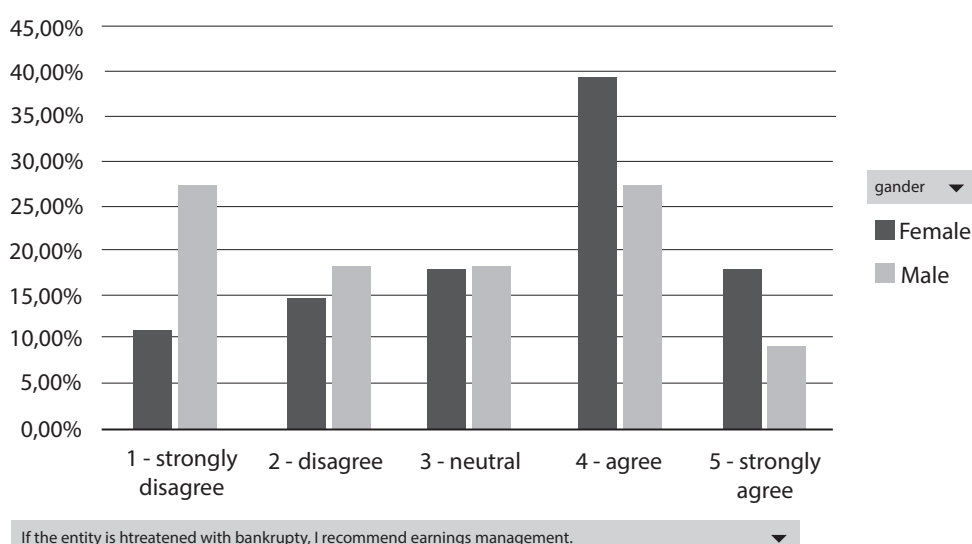




Figure 7. Earnings management practice, accountants with less than ten years of experience.

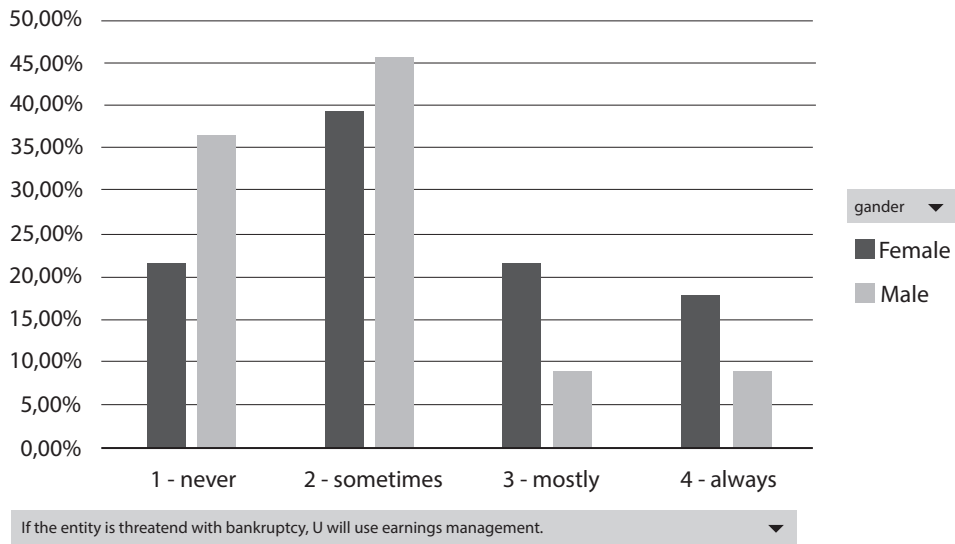


Figure 8. Earnings management recommendation, accountants with more than ten years of experience.

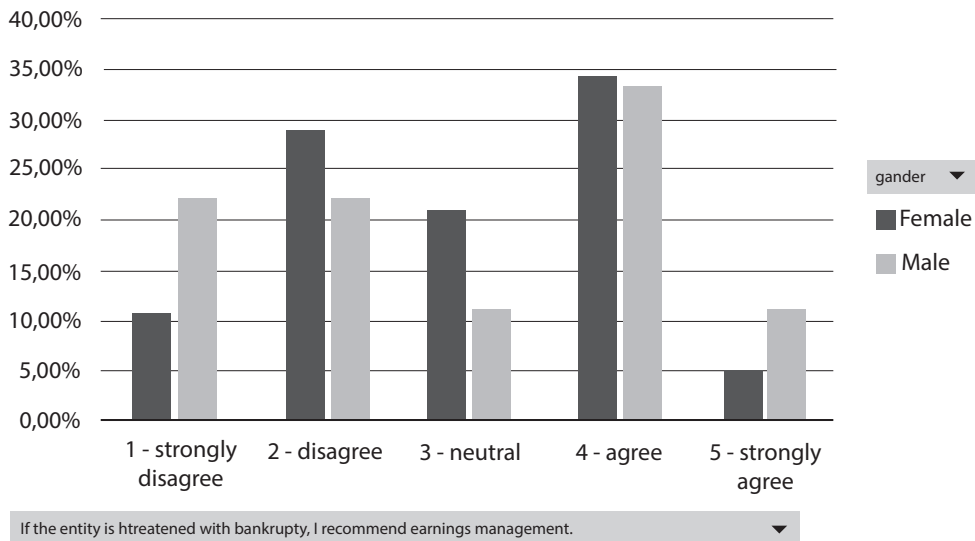
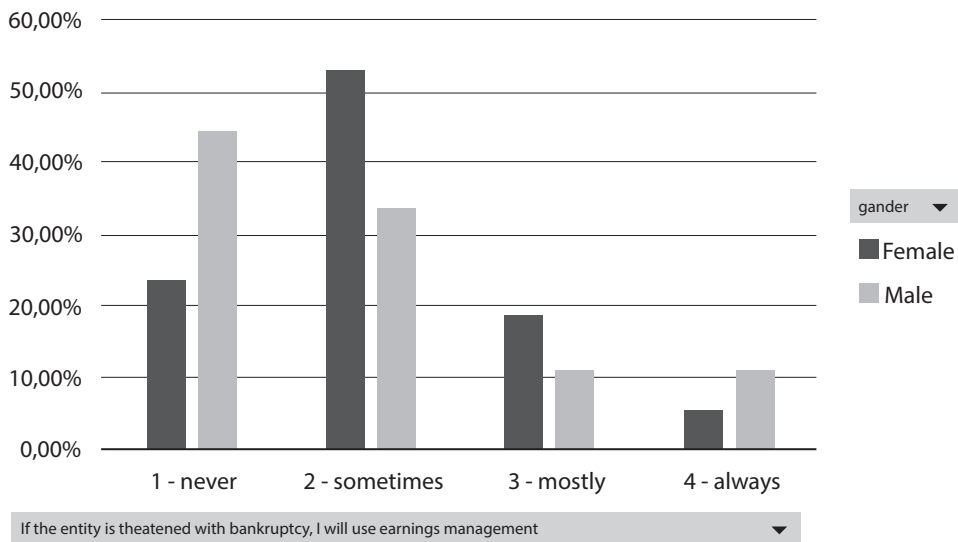


Figure 9. Earnings management practice, accountants with more than ten years of experience.





## 5. CONCLUSION

The study aimed to check whether gender impacts companies' accounting decisions. In the survey, we asked Polish accountants about their recommendations and practices regarding earnings management and using the amortised cost method. Based on the study results, it can be concluded that in the group of women accountants with professional experience of over ten years, a more cautious approach to valuation and earnings management can be observed than in men. Thus, the pilot study confirmed the assumptions about the positive impact of women on reducing company earnings management. Additionally, it can be noted that the attitude of women accountants with longer professional experience towards earnings management is more negative than that of accountants with short professional experience (Ittonen et al., 2013). The study is preliminary, and the analysis of the results covers only 4 of the 16 questions asked to respondents. In the next stages of the study, we will use statistical tools to determine the relationship between the gender of accountants and their recommendations and professional practice.

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# MEASURING OF BANKING SYSTEM RESILIENCE BY USING THE TEXAS RATIO

Vladimir Mirković<sup>1\*</sup>,  
Marina Iliev Matić<sup>1</sup>,  
Branislav Dudić<sup>2</sup>

<sup>1</sup>Economists Association  
of Belgrade,  
Belgrade, Serbia

<sup>2</sup>Faculty of Management,  
Comenius University,  
Bratislava, Slovakia

## Abstract:

The issue of banking sector resilience is one of the most exploited after global financial crisis. Competent authorities and central banks worldwide conducted series of actions to strengthen their systems and made it more resilient on extraordinary events. For that purpose, there were conducted stress tests leading to results for improvement of central bank's supervisory activities and practices. Also, the analysis of banking sector resilience should be complemented with other measures, which are also treated as early warning indicators. Texas ratio is one of the early warning indicators that could indicate the banking system stability through the analysis of non-performing loans as portion of "toxic" assets in banks. High level of non-performing loans represents a huge threat for survival of banking systems, so their monitoring and efficient resolution is imperative. In paper, authors emphasize the significance of Texas ratio usage in the process of banking sector resilience evaluation.

## Keywords:

resilience, banking sector, non-performing loans, Texas ratio, Republic of Serbia.

## 1. INTRODUCTION

The last global financial crisis revealed a lot of deficiencies in banking sectors worldwide and creates a special type of challenge ahead of regulators and market participants. They were faced with necessity to adequately react and strengthen the banking sector resistance on unexpected events in the future period (Mirković & Knežević, 2013a). Regulatory reforms through Basel standards were aimed to increase the level of financial system stability and constitute market discipline in the financial sector (Mirković & Knežević, 2013b).

Strengthening of risk management function and improvement of capacities for early warning system development in banks became crucial for the stability of banking sectors worldwide. Among the most difficult risks for identification are those that bear hidden moral hazard. Taking excessive risk without adequate consequences lead to moral hazard (Knežević & Mirković, 2015) and put into the risk the functioning of banking systems. Basel regulatory standards in banking are important not only from the perspective of future crisis prevention, already from the aspect of well-organized financial system creation.

Nevertheless, Djukić (2012) elaborated that "the strategy of maintaining allegedly healthy and successful banking and financial sector in general, in circumstances of obvious distortion in real economy, is a priori adjudged to catastrophe". The linkage between real economy and financial sector is almost perfectly reflected via category of non-performing loans (hereinafter: NPLs). The low level of NPLs is one of the main preconditions for stable banking sector, whilst an extraordinary high level of NPLs could seriously damage the financial stability.

Correspondence:  
Vladimir Mirković

e-mail:  
vladamirkovic@orion.rs



On the long run observing, NPLs at unacceptable high level represent the main challenge that countries should face with in timely manner by selecting an adequate resolution method. Different resolution methods were implemented across countries and resulted in visible positive effect reflected in significantly lower gross NPL ratio.

This paper has following structure. The first title is dedicated to the main results of NPLs trends and resolution of this issue in banking industry, emphasizing events in the Republic of Serbia and CESEE countries. The second and central part of the paper is focused on the introduction of the Texas ratio as a useful tool for measurement of banking systems resilience. The third title is dedicated to the research results obtained via Statistical Package for Social Sciences - SPSS 21.0 (Armonk, NY: IBM Corporation).

## 2. REVIEW OF NPLS TREND IN THE BANKING INDUSTRY

When it comes about NPLs and their presence worldwide among banking systems, there should be considered certain facts that follows. Beside already elaborated problem of unique definition absence and necessity for harmonized approach regarding NPLs (Barisitz, 2011; Mirković & Knežević, 2014a), most of the countries applied the NPLs definition given by IMF (IMF, 2005). National bank of Serbia applied the definition of NPLs that is very similar to above mentioned IMF's definition (National bank of Serbia, 2019) with the key criterion described in threshold of 90 days or more past due.

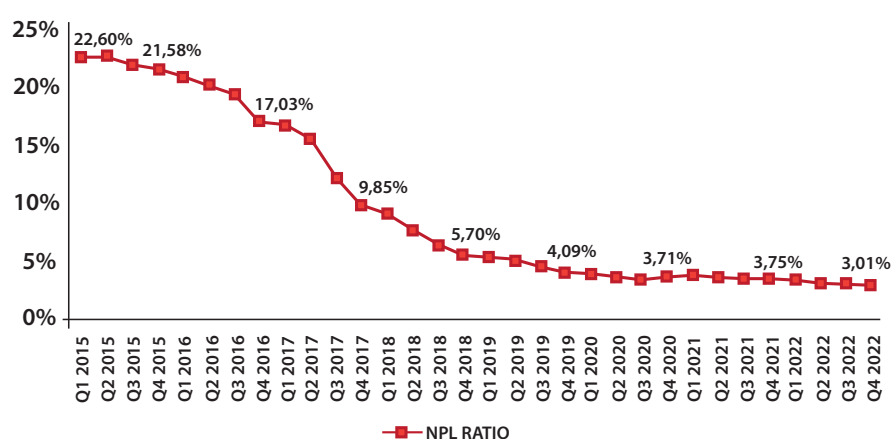
Furthermore, European Banking Authority (hereinafter: EBA) introduced non-performing and forbearance exposures in the document "Final draft Implementing Technical Standards on supervisory reporting on forbearance and non-performing exposures" (EBA, 2014) accompanied by the differentiation between transaction and debtor approach implementation and rules for determination of priorities between two of them (Mirković & Knežević, 2014b).

Outstanding high level of NPLs as well as inadequate risk management could cause loss of catastrophic dimension for banking industry. In many countries, NPLs have reached levels that negatively affect credit supply channels and lead to deterioration of the financial health indicators within the banking sector (Mirković, 2013c).

As NPLs could become a source of systemic risk and the state authorities of the Republic of Serbia (Government and National Bank of Serbia) have recognized the need to solve this issue as a task of high importance which requires the development of a comprehensive strategy with the involvement of all competent institutions (Pravno-informacioni sistem, Republike Srbije, 2015). Focus of the National bank of Serbia and its efforts to be fully aligned with Action plan and Strategy for NPL resolution was finally reflected in the adoption of "Decision on the accounting write-off of bank balance sheet assets" as end of September 2017 (National bank of Serbia, 2023). To resolve NPL issue on the long run, the Republic of Serbia expressed its orientation toward strategic, exhaustive approach based on market principles. Above mentioned approach has the main goal impersonated in creation of soundness bank's capacities for balance sheet "cleaning" and making possible a new credit cycle based on healthy background. This approach could be realized only if there exists a uniform attitude, i.e., consensus between all stakeholders that make active participation in removal of main drivers for NPLs growth in previous period (Mirković & Vujičić, 2018).

Results of systemic approach for NPL resolving in the Republic of Serbia are obvious: conducted measures resulted in downward trend of gross NPL ratio and reaching historical minimum at single digit percentage. Observing period of eight years (between Q1 2015 and Q4 2022), gross NPL ratio in Serbian banking sector was declined for more than 19.5 percentage points (from 22.6% to only 3.01%). Decreasing trend in gross NPL ratio in Serbian banking sector is presented on Figure 1 (National bank of Serbia, 2023). NPLs reductions were achieved via two channels, such as: direct write-offs and assignment of receivables (i.e., NPL sale).

Figure 1. Gross NPL ratio trend in Serbian banking industry between 2015 and 2022.





Various initiatives regarding NPL topic were introduced among the EU regulators. The main purpose of those incentives is alignment with best practices within Europe, making an important comparative advantage primarily for accession countries to EU. The effect of strategic approach in NPL resolution reflected in shrinking of NPLs at satisfactory rate in Serbia and CESEE countries are presented in Figure 1 and Figure 2, respectively. As of June 2022, average NPL ratio within group of CESEE countries reached 2.60%, which is the lowest level historically observed (Vienna Initiative, 2023). This indicates that the quality of bank assets has not deteriorated yet.

3. TEXAS RATIO: DEFINITION AND IMPLEMENTATION

Throughout history, when bank failures happen, it causes panic and an extraordinary amount of concern on the banking markets worldwide. To react preventively, analysts were occupied with defining metrics which are a kind of early warning system for potential bank collapses. The Texas ratio, as one of the most used metrics, was emerged in the 1980s to identify potential problem banks within the Texas economy.

Texas ratio could be defined as a measure of a bank’s credit troubles. Namely, it’s calculated by dividing the bank’s total non-performing assets (variable: NPA) and real estate owned (variable: RE) by its tangible common equity (variable: TCE) and loan loss provisions (variable: LLP). When banks are faced with financial difficulties, the crucial issue becomes the assessment of bank’s capital buffer which could cover potential losses derived from non-performing assets. The Texas ratio is calculated based on following formula:

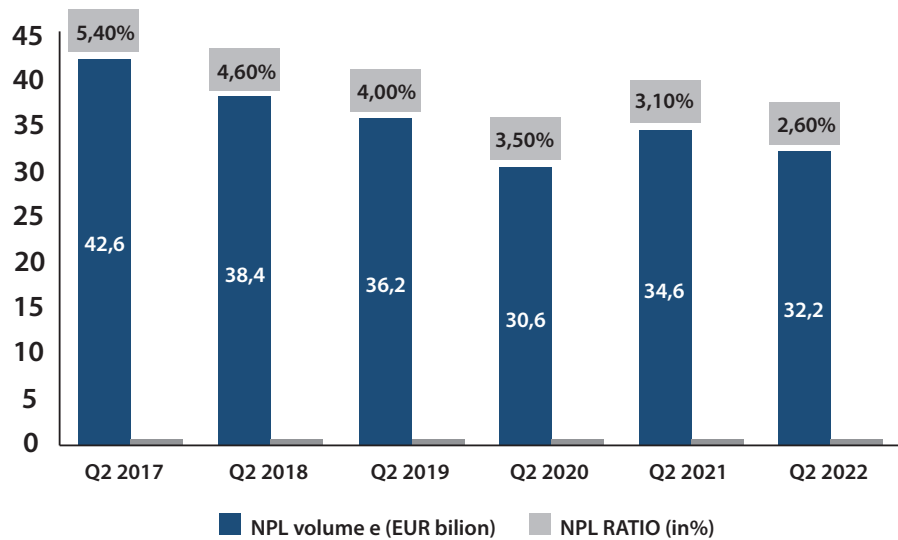
TR = (NPA + RE) / (TCE + LLP) (1)

where: TR = Texas Ratio  
NPA = Non-Performing Assets  
RE = Real Estate owned  
TCE = Tangible Common Equity  
LLP = Loan Loss Provisions

The main purpose of the Texas ratio introduction was to encounter many customers which defaulted on their loan repayments. When bank possess more non-performing assets than it has resources to cover any potential future losses on those assets, then the Texas ratio will be higher than threshold set at 1 or 100% and consequently banks are prone to failure (Property Metrics, 2023). Through the usage of the Texas ratio analysts could determine whether a bank has enough equity and money for bad loans coverage. In other words, it gives an answer on the following question: does a bank possess sufficient capital reserve which is adequate for loan losses coverage during fulfillment their obligations toward deponents?

In the numerator of Texas ratio are two variables: non-performing assets and real estate owned. Non-performing assets are related to the category of loans which are not being paid back in a timely manner. Variable NPA is solely related to loans in default upon which regular monthly payments are delayed for 90 days or more. The second variable in the numerator is the real estate which the bank owned through foreclosure, i.e., assets that could potentially become expenses for the bank. In the denominator of the Texas ratio is the variable Tangible Common Equity, which represent a measure of a bank’s physical capital, as well as the variable Loan Loss Provisions that could be observed as money reserved for anticipated future losses.

Figure 2. Gross NPL ratio in CESEE countries.



Source: Vienna Initiative, 2023.



Considering all variables included in the Texas Ratio, analysts could obtain an overview and visible driver for the assessment of stability and soundness within banking sector, even though it could vary widely between banks. Calculating the Texas ratio could lead to advantages for investors and customers. For customers, the knowing of the Texas ratio could be a great signal for the extent of the security of their funds. Latter is closely related to protection of deponents and their rights, with most important issue related to an appropriateness of equal insurance premiums. The purpose of establishing differentiation among insurance premiums is reflected into avoidance of excessive risk taking and taking corrective actions from the supervisory point of view.

The Law on Deposit Insurance in Serbia implies linear approach that is related to banks obligations to pay initial premium equals to 0.3% of the cash portion of minimum initial capital of the bank (Deposit Insurance Agency, 2023). Oppositely from described approach, Djukić (2013) exposed its proposal regarding differentiation of insurance premium imposing as a main criterion: observing an achieved capital adequacy ratio (CAR) of certain banks in relation with regulatory level of CAR. Introduction of this approach is leading to obvious differentiation between banks that have adequate risk management and those without it.

The aim of Djukić's proposal (Table 1) is to exactly precise assignment of the responsibility for bad management in certain banks (Mirković, 2015).

The Texas ratio functions effectively when it is complemented with other financial ratios. Also, it should bear in mind that a high Texas ratio does not necessarily mean that the bank will fail because many banks with high ratios could stay solvent, while banks that seem solid sometimes hit the buffers. The evolution of the Texas ratio and its downward trend in Serbian banking industry between Q1 2015 and Q4 2022 is presented on Figure 3.

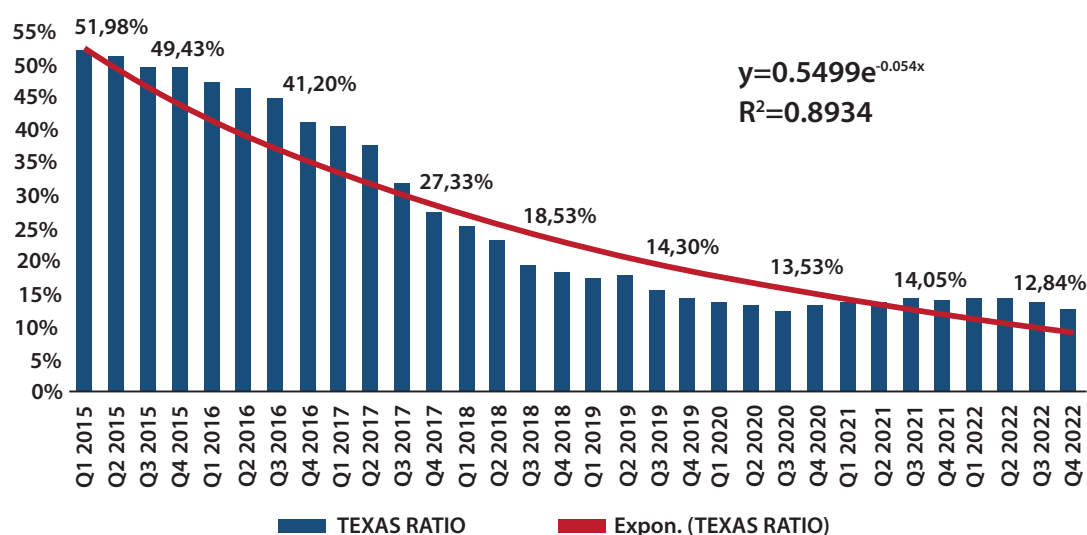
As per Figure 3, the Texas ratio in Serbian banking industry felt by almost 40 percentage points, whilst in the same period NPLs (which are one of the constitutive elements of the Texas ratio) declined for more than 19.5 percentage points. Additional shrinkage of NPLs is a realistic scenario as a result of the extension activities that encompass engagement of all competent authorities and market participants which are actively involved in the process of NPLs resolution as well as prohibiting the inflow of newly generated NPLs.

Table 1. Difference among insurance premiums - proposal

Achieved CAR vs. Average CAR	Haircut
If achieved CAR is higher than average CAR maximum to 15%	50%
If achieved CAR is higher than average CAR maximum to 30%	60%
If achieved CAR is higher than average CAR more than 30%	70%

Source: Djukić (2013)

Figure 3. Evolution of the Texas ratio in Serbian banking industry between 2015 and 2022.





#### 4. RESEARCH RESULTS AND DISCUSSION

Data series regarding NPL ratio and the Texas ratio in a period between Q1 2015 and Q4 2022 were inputted in Statistical Package for Social Sciences - SPSS 21.0 due to further examination. Cronbach alpha coefficient was 0.893, determining high reliability and validity.

Before conducted analysis, there was calculated a contingency coefficient which reached 0.984 (far away from zero) meaning that those two variables are associated, but for precise dependence there should be complemented with other variables. In terms of correlation between NPL ratio and the Texas ratio it should be noted following:

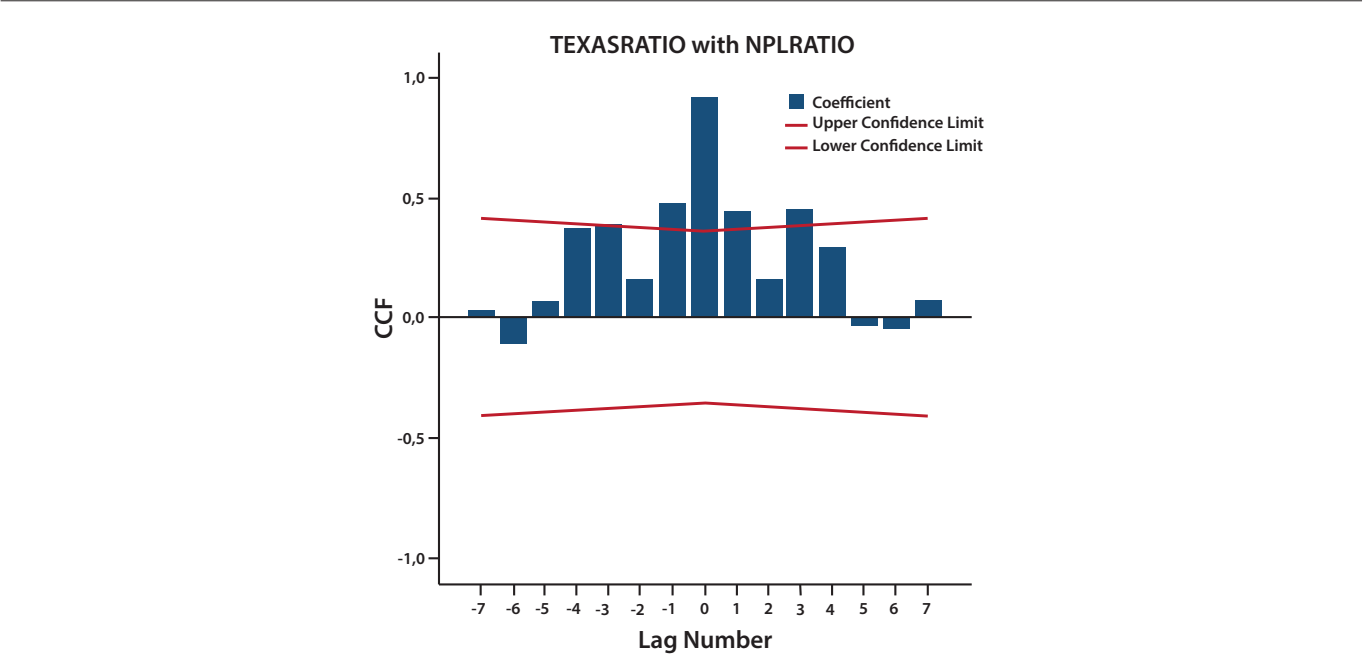
- Pearson correlation between observed variables equals 0.999 (indicated that values from 0.75 to 1 could be assessed from very good to excellent correlation);
- Kendall's tau\_b coefficient is 0.859 meaning that coefficient is very close to 1, i.e., signaling almost perfect positive monotonous relation;
- Spearman's rho coefficient stands at 0.947 indicating a high positive relationship between variables.

The strongest correlation between variables occurs at lag 0, which is showed on Figure 4. The correlation itself equals 0.917 (Table 2). Above mentioned shows that series which are related NPL and Texas ratio are strongly

Table 2. Cross correlation between NPL and Texas ratio.

Lag	Cross Correlation	Std. Error
-7	.016	.204
-6	-.098	.200
-5	.067	.196
-4	.371	.192
-3	.386	.189
-2	.150	.186
-1	.474	.183
0	.917	.180
1	.443	.183
2	.155	.186
3	.444	.189
4	.289	.192
5	-.015	.196
6	-.037	.200
7	.067	.204

Figure 4. Cross correlation between NPL and Texas ratio.







simultaneously correlated. Furthermore, indicated strong positive correlation means that both series behave analogously to other exogenous factors. In Figure 4 are also presented data that pinpoint on negative cross correlations at lag  $-6$  as well as lags  $+5$  and  $+6$ , respectively. Finally, notwithstanding that those two series showed positive respond to contemporaneous factors, they are at the same time slightly negatively correlated with each other over time.

In terms of the degree of lack of symmetry (skewness) as well as the measuring the frequency of outliers occurring tested in relation with a normal distribution (kurtosis), via usage of SPSS 21.0 authors obtained following results, as it is presented in Table 3:

Considering that skewness for both, NPL and Texas ratio, stands between 0.5 and 1 we are considering that the distribution is moderately skewed, whilst kurtosis reference values for Texas ratio ( $-1.23$ ) and NPL ratio ( $-1.18$ ) pinpoint on platykurtic distribution (lighter tails that are shorter and contain fewer outliers).

## 5. CONCLUSION

Outstanding high level of NPLs was recognized as a large threat for survival of economies within EU and the Republic of Serbia. On the long run observing, NPLs at unacceptable high level represent the main challenge that countries should face with in timely manner by selecting

an adequate resolution method. Through resolution via private equity fund formations specialized in NPLs, or alternatively, there were created prerequisites for removing the obstacles that deteriorate economic growth.

In this paper are summarized conducted measures in EU and the Republic of Serbia regarding NPL resolution, which resulted in more than significant decline of gross NPL ratio. Also, authors presented the Texas ratio, which contains NPLs as one of the calculation elements, as very valuable tool which gave us an overview and visible driver for the assessment of stability and soundness within banking sector, even though it could vary widely between banks. The Texas ratio gave advantages for investors and customers, as it could be observed as a great signal for the level of the security of their funds.

Through implementation correlation and cross-correlation analysis, by using SPSS 21.0, authors concluded that there is a high positive correlation between analyzed variables: NPL ratio and the Texas ratio. Also, empirical evidence in the case of EU countries, on the one side and the Republic of Serbia on the other side, showed the declining trend in the NPL ratio variable during observed period. Similarly, the Texas ratio variable was analyzed in Serbian banking sector, and it showed decreasing trend, confirming positive correlation with variable NPL ratio. Although, it is not a common practice, this study gave very useful results for usage of the Texas ratio on the banking sector level and pointed that a described possibility could be beneficial for practitioners from the economics.

**Table 3.** Skewness and kurtosis for variables.

Type:	Texas Ratio	NPL Ratio
Skewness	0.70	0.75
Kurtosis	-1.23	-1.18

Source: Author's, SPSS 21.0.

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# SAUDI CRUDE OIL AND THE GCC STOCK MARKETS: EFFECT OF COVID-19 OUTBREAK?

Nikola Stakić<sup>1\*</sup>,  
Anas Ali Al-Qudah<sup>2</sup>,  
Miklesh Prasad Yadav<sup>3</sup>

<sup>1</sup>Singidunum University,  
Belgrade, Serbia

<sup>2</sup>Faculty of Business, Liwa College,  
Abu Dhabi, UAE

<sup>3</sup>Indian Institute of Foreign Trade (IIFT),  
Kakinada, India

## Abstract:

This study aims to explore the dynamic connections between Saudi crude oil prices and GCC (Gulf Cooperation Council) equity markets during the COVID-19 outbreak. To represent the Saudi oil market, we utilize the Saudi Aramco share price, while the equity markets of GCC economies are approximated using the DFM General Equity, MSCI Qatar Equity, Kuwait Main Market 50, MSCI Oman Equity, and Bahrain All Share Equity indices, respectively. The data used in our analysis spans from December 31, 2019, to July 31, 2022. The empirical findings of our research indicate that there is no discernible relationship between Saudi crude oil and the Bahrain equity market, both in the short and long term. However, for the other markets examined, we observe a mix of linkages in both the short and long run. Furthermore, our study reveals that the Oman stock market exhibits the most significant influence on the observed dynamics, while the Bahrain equity market appears to be the most responsive to external shocks.

## Keywords:

Crude oil, GCC economy, COVID-19, Stock markets.

## 1. INTRODUCTION

Saudi Arabia, as the world's second-largest exporter of crude oil, naturally holds a significant role in shaping the dynamic interconnections and spillover effects within the consortium of six Middle Eastern nations known as the GCC. The price per barrel of crude oil experiences fluctuations globally, impacting economies across the board. The GCC has emerged as a crucial player in the world's rapidly growing economies and serves as a bridge linking the Eastern and Western segments of the global market (Hussain & Rehman, 2023).

In terms of oil reserves, Saudi Arabia boasts the largest, followed by Kuwait and the UAE, while Qatar possesses abundant gas reserves. Oman and Bahrain have relatively smaller reserves, with the UAE reporting a high rate of oil extraction from its reserves. According to an IMF working paper, the GCC collectively accounts for 34% of the world's oil exports, as reported by the US Energy Information Administration in 2018. Analysing the co-movements of crude oil with other markets can offer valuable insights into how the GCC's potential for diversifying its non-energy sectors can be harnessed through strategic investments to achieve sustainable economic growth.

Moreover, fluctuations in Saudi oil prices can significantly impact investors' portfolios, particularly those with exposure to assets influenced by oil prices, such as energy sector stocks, given oil's pivotal role as a global commodity. In such cases, diversification across various asset categories, particularly non-energy sectors and cross-border economies, becomes crucial for investors to hedge against volatility. Rising oil prices can benefit commodity investments, while declining prices can have adverse effects (Hussain & Rehman, 2023).

Correspondence:  
Nikola Stakić

e-mail:  
nstakic@singidunum.ac.rs





It's worth noting that oil price fluctuations can also affect the exchange rates of currencies in oil-exporting countries, potentially impacting the returns on foreign investments denominated in those currencies. Additionally, one of the critical impacts of crude oil price movements is on inflation expectations, which, in turn, can influence interest rates. If rising oil prices contribute to expectations of higher inflation, central banks may respond by raising interest rates. In summary, the reactions in Saudi Arabian crude oil prices can have ripple effects on the stock markets of GCC economies.

## 2. RESEARCH OBJECTIVE

The primary aim of this research is to examine and assess how changes in the price of Saudi crude oil impact the stock markets in the GCC countries. Analysing the evolving relationships between oil and equity markets offers valuable insights for implementing a range of policies, including strategies for investments, portfolio management, risk reduction through diversification, hedging, and informed policymaking. This study seeks to address the following key research inquiries:

- Is there a transfer of volatility from Saudi crude oil to the GCC stock markets during the COVID-19 crisis, and if so, what is the extent of this transfer?
- Does the dynamic connection of volatility among these markets change as we shift from the short-term to the medium-term and from the medium-term to the long-term?

This research paper explores the transmission of crude oil effects to GCC equity markets, as represented by MSCI major equity indices.

It aims to provide insights into how COVID-19 has affected the evolving relationships between crude oil and equity markets. This investigation is conducted through a comprehensive battery of tests designed to assess their interconnectivity.

The results of the dynamic conditional correlation (DCC) analysis indicate that the Bahrain market remains distinct in that it does not exhibit spillovers from Saudi crude oil, neither in the short term nor in the long term. Notably, Saudi Aramco's crude oil plays a dominant role in these examined markets, serving as the most significant net transmitter of the associated shocks when compared to the network connections.

Furthermore, according to the model proposed by Barunik and Krehlik (2018), it is revealed that the medium-term time frame demonstrates the least degree of connectedness, while the long run exhibits the highest level of linkages among these markets.

## 3. LITERATURE REVIEW

We provide a summary of the current literature on prior research regarding the transmission or dynamic connections among different asset classes in Table 1:

Following an exhaustive analysis of relevant existing literature encompassing numerous variables, asset classes, economies, and markets, we have gained insights into how this study addresses the gap between prior research and the current state of knowledge. Our examination has revealed that there is a noticeable absence of studies focused on investigating the interconnections between the Saudi Arabian crude oil market and the remaining GCC equity markets during the period of the COVID-19 pandemic.

Table 1. Example of a numerated table.

Studies	Assets class / Markets	Data period	Methods	Findings
(Malhotra et al., 2023)	Commodity and financial market	February 24,2022- July 31,2022 (daily)	DCC GARCH, Diebold &Yilmaz (2012) and BK (2018)	Dynamic connectedness exists between agri based commodities and stock market of selected countries.
(Ouyang et al., 2023)	Global stock market	2006 – 2022 (Daily)	VAR & NARDL	Various impact at short medium and long-term cycles, majorly Asian market received highest risk.
(Yousaf et al., 2022)	Islamic stock, oil, gold, bond, and real estate in GCC	2004-2021 (Daily)	BEKK GARCH	Significant dynamic linkages between GCC stock returns and selected markets.
(Sarwar et al., 2020)	Crude Oil and Stock Market in Karachi, Shanghai, Bombay	1997-2014 (Daily)	BEKK GARCH	Bidirectional spillover in Karachi, unidirectional in case of Shanghai and mixed in case of Mumbai

Source: Author's.



Furthermore, this study extends the contributions made by previous research by categorizing the spillover effects, identifying major and minor net-receiving and net-transmitting economies across various timeframes, including the short, medium, and long term. Our research is poised to provide valuable insights for investors in navigating these interconnected markets during one of the most unprecedented global crises in history.

To investigate how the influence of the Saudi oil market extends to other GCC nations, we analyze daily logarithmic prices spanning from December 31, 2019, to July 31, 2022. For empirical analysis, we utilize the primary MSCI equity indices for each respective country, while for Saudi Arabia, we rely on the share price of Saudi Aramco as a proxy for movements in the Saudi oil price. The major equity indices representing the UAE, Qatar, Kuwait, Oman, and Bahrain are also included in our study. A detailed description of the constituent series can be found in Table 2 below:

## 4. RESULTS AND DISCUSSION

In this section, we provide descriptive statistics and present the empirical findings derived from the DCC (Dynamic Conditional Correlation) analysis, as well as the models proposed by Diebold and Yilmaz (2012) and Barunik and Krehlik (2018). Table 3 compiles essential elements of descriptive statistics. It is noteworthy that all series display positive average returns, except for the Kuwait equity market. The Omani market achieves the highest average return at 0.0009, while the UAE equity market exhibits the highest level of volatility. Each market under scrutiny demonstrates negative skewness and adheres to a leptokurtic distribution, confirming that the returns from these markets do not follow a normal distribution pattern. Furthermore, the Augmented Dickey-Fuller (ADF) test is applied to assess stationarity, revealing that each series is indeed stationary.

**Table 2.** Description of the selected equity indices of GCC countries.

Variables	Country	Indices	Source
Crude Oil	Saudi Arabia	Saudi Aramco	Bloomberg
DFM General Equity	UAE	DFMGI	
MSCI Qatar Equity	Qatar	MIQA00000PQA	
Kuwait Main Market 50	Kuwait	BMK50	
MSCI Oman Equity	Oman	MIOM00000POM	
Bahrain All Share Equity	Bahrain	BAX	

Source: Author's.

**Table 3.** Descriptive Statistics of examined markets.

Variables	Country	N	Min	Max	Mean	Std.Dev	Skewness	Kurtosis	ADF test
Saudi Aramco Crude Oil price	Saudi Arabia	467	-0.1518	0.0941	0.0001	0.0167	-2.4993	27.6354	0.000***
DFM General Equity	UAE	467	-1.2511	1.2470	0.0004	0.0861	-0.0947	186.6788	0.000***
MSCI Qatar Equity	Qatar	467	-1.2657	1.2603	0.0003	0.0839	-0.1159	216.7581	0.000***
BKP Kuwait Premier market	Kuwait	467	-0.2870	0.2523	-0.0001	0.0260	-3.6889	70.3045	0.0100**
MSCI Oman Equity	Oman	467	-0.2504	0.2648	0.0009	0.0220	-0.5496	86.8087	0.0000***
Bahrain All Share Equity	Bahrain	467	-0.0946	0.0426	0.0004	0.0090	-3.3727	32.8791	0.0050***

Source: Author's.



#### 4.1. Diebold & Yilmaz (2012) model

While the DCC model helps us comprehend the short-term and long-term spillover within different asset classes, it does not provide insights into the extent or magnitude of this spillover effect, as noted by Yadav et al. in 2022. To address this aspect, we subsequently apply the Diebold & Yilmaz (2012) model to unravel this puzzle.

Table 4 displays the outcomes derived from the Diebold & Yilmaz (2012) model. In this table, "From" denotes the shock received from the network connection, while "To" signifies the transmission of the shock to the markets under examination. When considering the recipients of the shock, it is notable that the Bahrain equity market experiences the most significant shock or volatility (14.3%) from the network connection, followed by the Omani market (11.4%). In contrast, Saudi Aramco's crude oil demonstrates the lowest reception of the shock at 9.59%.

#### 4.2. Barunik and Krehlik (2018) Model

The Diebold & Yilmaz (2012) model provides insights into the average connectedness, regardless of fluctuations in asset classes, which doesn't offer a precise depiction of the differing impact from one market to another. For a more comprehensive understanding of frequency-based connections across various timeframes, we utilize the Barunik and Krehlik (2018) model, as presented in Table 5. In this table, short-term, medium-term, and long-term connectedness.

Considering the observed connections across short, medium, and long-term periods, it becomes evident that investors and portfolio managers who hold diversified assets across various equity markets should carefully assess the spillover effects and interconnections. Because various factors exert influence differently at different times, markets react in distinct ways, resulting in time-varying linkages between them. Consequently, the extent of spillover may vary from the short term to the medium term and from the medium term to the long term.

**Table 4.** Results of Diebold & Yilmaz (2012) model.

	Saudi. Aramco	UAE	Qatar	Kuwait	Oman	Bahrain	FROM
Saudi Aramco	42.46	13.87	4.61	12.24	16.29	10.53	9.59
UAE	4.87	35.83	23.63	16.39	13.72	5.56	10.7
Qatar	12.46	35.5	41.86	0.87	4.09	5.22	9.69
Kuwait	14.56	10.68	0.87	40.25	28.6	5.04	9.96
Oman	26.29	13.65	2.88	14.92	31.6	10.66	11.4
Bahrain	23.66	13.76	2.56	21.17	24.87	13.99	14.3
TO	13.64	14.58	5.76	10.93	14.59	6.17	65.67
Net	4.04	3.88	-3.93	0.97	3.19	-8.16	

Source: Author's.

**Table 5.** Result of Barunik and Krehlik (2018).

	Saudi. Aramco	UAE	Qatar	Kuwait	Oman	Bahrain	FROM
Saudi Aramco	40.53	13.85	4.57	11.64	16.19	10.38	10.04
UAE	4.8	31.63	19.62	16.32	13.6	5.29	10.57
Qatar	12.21	26.3	31.78	0.84	3.86	4.69	8.49
Kuwait	13.65	10.63	0.86	38.88	28.38	4.54	10.29
Oman	26.19	13.59	2.82	14.9	31.56	10.63	12.07
Bahrain	23.58	13.68	2.54	21.13	24.66	13.95	15.17
TO	14.25	13.83	5.39	11.49	15.36	6.3	66.62
Saudi Aramco	UAE	Qatar	Kuwait	Oman	Bahrain	FROM	

Source: Author's.



According to the Barunik and Krehlik (2018) model, the medium term exhibits the least degree of interconnectedness at 50.38%, whereas the long run demonstrates the highest level of linkages at 66.62%. Therefore, investors may find it advantageous to manage their risk during the medium term, as overall linkage is lower during this period. These findings align with the conclusions drawn by Hussain and Rehman (2023).

## 5. CONCLUSION

Our findings provide answers to the research question, revealing that there is indeed a spillover effect from Saudi crude oil to the equity markets of the UAE, Qatar, and Kuwait, but this effect is only observed in the long run. Furthermore, the Oman market experiences spillover from Saudi crude oil in both the short run and the long run. In contrast, the Bahrain market stands out as it does not exhibit spillover effects from Saudi crude oil in either the short run or the long run.

In addition, our analysis shows that Saudi Aramco's crude oil and the equity markets of the UAE, Kuwait, and Oman serve as net transmitters of shocks, while the equity markets of Qatar and Oman act as net receivers of these shocks. Specifically, Saudi Aramco's crude oil plays a dominant role in the network connection as the largest transmitter of shocks.

Furthermore, according to the Barunik and Krehlik (2018) model, the medium term demonstrates the least level of interconnectedness at 50.38%, while the long run displays the highest degree of linkages at 66.62%. These findings align with the conclusions drawn by Hussain and Rehman (2023).

The empirical results offer policy implications across three dimensions: for investors, policy analysts, and portfolio managers. First, investors may base their investment decisions on the major MSCI equity indexes representing the core of the GCC economy and the critical commodity, crude oil, represented by the world's major oil exporter. Second, the Bahrain All Share Equity market appears to be a favourable option for diversification since it does not exhibit spillover connections with Saudi crude oil in both the short and long run. Third, investors or portfolio managers may consider diversifying their funds in the medium term, as the extent of spillover is lower than in the long run.

While this study delves into an examination of the spillover effects from Saudi crude oil to the stock markets of GCC economies, it is essential to acknowledge its limitations. Future research could expand its scope by considering other groups of economies such as MENA, MINT, Asian economies, and G7 nations. Furthermore, it could broaden its analysis by incorporating various asset classes, including non-renewable energy, renewable energy markets, and metal markets, among others.

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# BALANCING HOSPITALITY AND REPORTING: ANALYZING THE IMPACT OF IFRS 16 IN THE HOTEL INDUSTRY

Maja Kljajić<sup>1\*</sup>,  
Vule Mizdraković<sup>1</sup>,  
Mirjana Mizdraković<sup>2</sup>,  
Blaženka Hadrović Zekić<sup>3</sup>

<sup>1</sup>Singidunum University,  
Belgrade, Serbia

<sup>2</sup>School of Textile Design,  
Belgrade, Serbia

<sup>3</sup>Faculty of Economics in Osijek,  
Osijek, Croatia

## Abstract:

The International Accounting Standards Board unveiled IFRS 16 - *Leases* in January 2016, replacing IAS 17 - *Leases* for reporting periods commencing on or after 1<sup>st</sup> January 2019. The updated regulations introduce dissimilar accounting models for lessees and lessors. Although the significance of distinguishing between finance leases and operating leases has diminished for lessees, it still holds relevance for lessors. The influence of IFRS 16 on a company is contingent on the quantity of existing operating lease agreements and differs across various industries. The effect of the implementation of this standard in the hotel industry, as one of the industries with the highest amounts of leased assets, is the primary emphasis of this paper. Throughout the extensive literature review, the main challenges and consequences of this standard's implementation will be analyzed.

## Keywords:

financial reporting, IFRS, IAS, leases, lessee.

## 1. INTRODUCTION

In an era where accounting standards are continuously evolving to enhance financial transparency and comparability, the introduction of IFRS 16 has brought significant changes to lease accounting practices across industries. For the hotel sector, renowned for its intricate network of lease agreements that span properties, furnishings, and equipment, the adoption of IFRS 16 represents a pivotal juncture where the pursuit of hospitality excellence intersects with the precision of accurate financial reporting. This review paper delves into the multifaceted realm where hospitality operations meet financial statements, with a focus on how the implementation of IFRS 16 has resonated within the hotel industry. This is where the purpose of this paper lies, as the proper implementation of financial reporting standards poses numerous challenges and obstacles. Therefore, the contribution of this paper is reflected in assisting financial reporting practitioners and highlighting the importance of the appropriate implementation of IFRS 16. The paper is structured as follows: The following section provides an overview of IFRS 16 and the changes in leasing practices it brought. That will be followed by the main challenges and considerations of its implementation, as well as managerial and financial implications. Before conclusions are drawn, a review of the literature in this field will be presented. Finally, the paper will provide conclusions and offer recommendations for potential future research directions.

Correspondence:  
Maja Kljajić

e-mail:  
mkljajic@singidunum.ac.rs





## 1.1. IFRS 16 OVERVIEW

International Financial Reporting Standard (IFRS) 16 - *Leases* replaced the previous International Accounting Standard (IAS) 17 - *Leases* and became effective for annual reporting periods beginning on or after January 1<sup>st</sup>, 2019. Its mandatory application in the Republic of Serbia starts from January 1<sup>st</sup>, 2021, meaning that financial statements prepared for 2021 and later reporting periods must be in accordance with said standard. IFRS 16 establishes guidelines for the recognition, measurement, presentation, and disclosure of transactions related to leasing (IFRS, 2023). The primary distinction between the updated IFRS 16 and the previously used IAS 17 revolves around how operational lease agreements are recorded in the financial records of the lessee (the entity that leased the object of the agreement). Notably, lease costs are no longer recognized on a linear basis, i.e., spreading the lease expenses evenly over the lease term. Upon the adoption of this standard in the financial records, the lessee acknowledges both the right-of-use asset and the lease liability. Specifically, calculating the present value of the lease liability necessitates determining an appropriate discount rate. The implementation of IFRS 16 results in several significant changes: an increase in the lessee's fixed assets and lease liabilities on the balance sheet; a reduction in lease expenses; an increase in depreciation expenses; and a rise in interest expenses on the income statement. Furthermore, the new accounting approach has implications on the cash flow statement as well. The implications of IFRS 16 extend beyond the financial reporting process, resonating throughout various industries. The hotel industry, known for its dynamic lease agreements covering not only physical space but also a wide range of services and amenities, is uniquely positioned for a thorough assessment of the impact of IFRS 16 (IFRS, 2023).

## 1.2. HOTEL LEASE ACCOUNTING PRACTICES

The hotel industry, characterized by its diverse array of lease agreements, navigates a complex landscape of contractual arrangements that go beyond mere occupancy of physical space (Schlup, 2004). Hotel lease agreements encompass not only properties but also an intricate web of services, amenities, furnishings, and equipment. These multifaceted arrangements have been traditionally structured in ways that align with the industry's unique operational requirements. However, the introduction of IFRS 16 prompts a reevaluation of these practices and necessitates an understanding of how they intersect with the principles set forth in the standard (EY, 2016). Hotel lease agreements encompass a variety of arrangements, each tailored to cater to different aspects of the guest experience. Property leases form the cornerstone of these arrangements, with hotels leasing space to accommodate guests. Additionally,

equipment leases are prevalent, covering furnishings, fixtures, and specialized equipment used in hotel operations. Moreover, service agreements, which involve the provision of various services in conjunction with the lease of space, contribute to the intricate tapestry of hotel lease accounting practices. Unlike industries where lease agreements often center solely on the use of space, hotel leases encompass a range of services that contribute to the overall guest experience. From concierge services and housekeeping to access to amenities such as pools and fitness centers, hotel lease agreements incorporate a blend of hospitality elements. As such, the recognition of lease components and the allocation of payments to various aspects of the agreement can present unique challenges. Furthermore, the often-long-term nature of hotel lease agreements introduces considerations related to contract modifications and evolving service offerings.

### 1.2.1. Pre-IFRS 16 Accounting Practices and Transition and Implementation Challenges

Before the advent of IFRS 16, hotel lease accounting practices typically adhered to the guidance outlined in IAS 17 (IFRS, 2023). Many hotels classified lease agreements as operating leases, resulting in off-balance sheet treatment. While this approach allowed for operational flexibility, it also limited the visibility of lease obligations in financial statements (Liviu-Alexandru, 2018). The dynamic nature of hotel leases, involving both physical space and services, often led to complex assessments of whether leases met the criteria for capitalization. To satisfy the recognition criteria under IFRS 16, a lease agreement needs to meet these conditions (Rihter & Conic, 2022):

- The asset must be clearly specified;
- The lessee must derive most of the economic advantages from utilizing the leased asset; and
- The lessee must possess the authority to dictate how the asset is utilized.

The transition to IFRS 16 has prompted hotels to reassess their lease accounting practices (Zamora-Ramírez & Morales-Díaz, 2018). The complexities introduced by the standard's new recognition criteria have necessitated a comprehensive review of existing lease agreements. This involves identifying lease components, determining lease term and payments, and applying the appropriate discount rates. The diverse nature of hotel leases, often involving intricate service offerings, amplifies the intricacy of these assessments. Hotels must balance the precision of lease accounting with the fluidity of their operational models. The advantages generated by IFRS 16 include (Liviu-Alexandru, 2018):

- The quality of financial statements for companies that include off-balance sheet leasing contracts



will see an enhancement. This will lead to an improvement in the comparability of financial statements between reporting periods as well as business entities among themselves.

- By accurately reflecting assets and liabilities on the balance sheet, the company's transparency is heightened. Consequently, investors and stakeholders can assess the company's financial position and performance more effectively in a qualitative manner. This stems from the comprehensive representation of assets under the tenant's control and utilization for their operations.
- The enhancement in comparability results from the recognition of assets and liabilities for all leases, a uniform assessment approach, and the recognition of only acquired rights and obligations arising from the lease.

### 1.3. CHALLENGES AND CONSIDERATIONS

The implementation of IFRS 16 within the hotel industry is not devoid of challenges. Namely, they arise from the distinctive nature of hotel lease agreements, and the intricate blend of services, and physical space they encompass. As hotels strive to balance the art of hospitality with the precision of financial reporting, several challenges emerge, warranting careful consideration (Stancheva-Todorova & Velinova-Sokolova, 2019). The upcoming figure will illustrate the challenges and considerations of IFRS 16.

One of the foremost challenges in implementing IFRS 16 lies in the collection of lease-related data (Magli et al., 2018). Hotels must gather a comprehensive inventory of lease agreements, encompassing both property leases and equipment leases. The diverse array of services embedded within these agreements necessitates meticulous identification of lease components. The inclusion of various service elements, often intertwined with lease payments, demands a granular understanding of contractual terms and an ability to distinguish between lease and non-lease components.

Hotels are increasingly turning to software solutions to aid in the transition to IFRS 16 compliance. These solutions are designed to facilitate data management, lease identification, and the calculation of lease liabilities. However, the integration of such software into existing operational systems presents a challenge (Stancheva-Todorova & Velinova-Sokolova, 2019). Ensuring seamless data transfer, compatibility with accounting platforms, and user training necessitates a strategic approach to software implementation.

The dynamic nature of hotel operations often leads to lease modifications, as service offerings are refined and adjusted to cater to guest preferences. These modifications can introduce complexities in lease accounting, necessitating the reassessment of lease terms, payments, and components. The challenge lies in maintaining accurate and up-to-date records of these modifications while adhering to IFRS 16's recognition criteria.

Figure 1. IFRS 16 Challenges and considerations.







Hotels engage in an array of lease types, ranging from long-term property leases to shorter-term equipment rentals. This diversity introduces considerations related to lease term determination, lease payments, and discount rate selection. Hotels must grapple with assessing the appropriate lease classification, considering the implications of IFRS 16's finance and operating lease distinction.

For hotels with international operations, IFRS 16 implementation may involve navigating varying local regulations and accounting practices. The challenge lies in achieving consistency in lease accounting across diverse geographical locations while adhering to local reporting requirements. With the implementation of IFRS 16 in the Republic of Serbia, there has also been a change in the Regulation on the chart of accounts and the content of accounts in the chart of accounts for other legal entities (Official Gazette of RS No. 89/2020, 2023) new accounts have been provided for recording business transactions related to lease agreements, namely:

- 015 - Intangible assets taken on lease - are intangible assets with the right to use for more than one year that meet the requirements to be recognized as assets in accordance with IFRS 16;
- 025 - Real estate, plants and equipment leased with the right to use for more than one year - are recognized on the lessee's financial statements for those leases or leases that meet the conditions for recognition as assets in accordance with IFRS 16; and

- 416 - Long-term lease liabilities - are presented as obligations arising from financial leasing or leasing obligations in accordance with the accounting policy.

#### 1.4. MANAGERIAL AND FINANCIAL IMPLICATIONS

The intersection of IFRS 16 with hotel lease accounting extends beyond financial statements, exerting influence on managerial decisions, strategic planning, and operational considerations (IFRS, 2023). The recognition of lease obligations on the balance sheet brings forth a cascade of implications that hotels must navigate while ensuring the seamless delivery of exceptional guest experiences. The upcoming figure will illustrate the Managerial and financial implications of IFRS 16.

With lease liabilities now visible on balance sheets, hotels may encounter shifts in lease negotiations. Lessors and lessees alike may approach negotiations with an altered perspective, considering the financial implications of lease commitments. This necessitates hotels to engage in more informed discussions and assess the long-term financial impact of lease agreements on their financial statements.

The transparency introduced by IFRS 16 can reshape the way hotels approach financial planning and budgeting (A&S Landscape, 2023). Lease payments that were once buried in operating expenses now command attention as explicit obligations.

Figure 2. Managerial and financial implications of IFRS 16.





This can prompt hotels to adopt more meticulous forecasting methods, ensuring that lease obligations are factored into long-term financial planning and budgetary decisions.

The shift in lease accounting under IFRS 16 may prompt hotels to reevaluate their decision-making processes concerning leasing versus purchasing assets. As lease obligations are brought to the forefront, hotels may reassess whether leasing is the most financially prudent option or if ownership would yield greater benefits over the long term.

The intricate interplay between service components and lease agreements necessitates hotels to adjust their operational strategies. Aligning the delivery of services with the delineation of lease components becomes crucial to ensuring that financial reporting accurately represents the economic reality of lease agreements. This entails collaboration between finance and operational departments to ensure consistency.

As hotels factor lease obligations into their balance sheet, the allocation of capital and investment decisions may be influenced. Capital-intensive projects may require a more nuanced evaluation, considering their impact on lease liability ratios and other financial metrics. Investment strategies may evolve to balance operational enhancements with financial prudence. Finally, transparent lease reporting under IFRS 16 demands effective communication with stakeholders. Hotels must articulate the implications of lease accounting changes to investors, analysts, lenders, and other interested parties. Clarity in communication is vital to ensure that stakeholders have an accurate understanding of the hotel's financial position and obligations.

## 2. LITERATURE REVIEW

This section starts with research with that conserve as a warning of possible ramifications of operating lease capitalization. Grossman & Grossman (2010) examined consequences of capitalizing operating leases within a dataset of 91 nonfinancial firms from the Fortune 500's top 200 list. They investigated the impact of incorporating total operating lease payments on the current ratio and the ratio of total liabilities to total assets. The findings indicate that, in a significant portion of the companies within the sample, both the current ratio and the total liabilities to total assets ratio have deteriorated. Consequently, this implies that certain entities are in breach of debt agreements, which mandate stringent debt ratio compliance. Also, they found that the most significant percentage rises in current liabilities occurred within from different industries.

This is not the first time authors notes the connection between leases and financial ratios (Barone, Birt, & Moya, 2014). Although a subset of these scholars has directed their attention toward examining its influence on stock market prices (Ro, 1978; Bowman, 1980), the majority have concentrated on scrutinizing how capitalizing operating leases affects critical financial ratios (Ashton, 1985; Imhoff, Lipe, & Wright, 1991; Beattie, Edwards, & Goodacre, 1998; Goodacre, 2003; Durocher, 2008; Jesswein, 2009; Grossman & Grossman, 2010; Singh, 2010; Fitò et al., 2013; Nuryani et al., 2015; Magli, Nobolo, & Ogliari, 2018; Rihter & Conic, 2022).

The impact of implementing IFRS 16 will vary based on the utilization of operating lease agreements across different industry sectors. Leases serve as a crucial and flexible method of financing for many entities, with listed companies that adhere to IFRS and U.S. GAAP collectively holding significant amounts of lease commitments. Prior to implementing the standard, research was undertaken to assess the potential impact of IFRS 16 adoption. Particular attention was given to its influence on the balance sheet, both pre- and post-implementation, by business entities. In order to offer insights into the anticipated effects of the implementation of IFRS 16 on the financial reports of Italian entities, (Magli et al., 2018) conducted an empirical investigation. In this research, data from the 2016 financial statements of 384 entities listed on the Italian Stock Exchange were employed to analyze operating lease commitments. The results offer insights into their impact on the performance and financial position of these entities. The study highlights notable alterations in the financial statements of lessees. To elaborate, the balance sheet will reflect an elevation in lease assets, a growth in financial liabilities, and a decrease in equity. Furthermore, the income statement will show an increase in EBITDA and a rise in finance costs. The implementation of IFRS 16 has been studied on Spanish entities, as well (Zamora-Ramírez & Morales-Díaz, 2018). Authors suggested that impact of standard is more pronounced compared to European companies, especially in sectors that are heavily affected. The balance sheet had significant changes, with both total assets and liabilities increasing, resulting in heightened leverage ratios. Additionally, there is a notable decline in the interest coverage ratio. Sectors with a larger proportion of leases belong to professional services, such as retail, hotels and restaurants, and media, had experience more pronounced effects.

Lemos et al. (2023) in their paper demonstrate that, during the initial year of IFRS 16 adoption, the average compliance level with disclosure requirements is approximately 0.66, when it comes to the sampled companies that are listed in Euronext Lisbon. As expected, the results of the multivariate analyses show a significant positive impact of auditor type on the compliance disclosure index.



Consequently, authors conclude that entities whose financial accounts are audited by one of the Big Four firms tend to exhibit a higher level of disclosure compared to those audited by other auditing firms.

Rihter & Conic (2022) have pointed out the impact of the new method on the performance of economic entities, particularly its influence on profitability and indebtedness. Rise in lease-related obligations will provide a more accurate representation of companies' indebtedness levels. Additionally, frontloading higher costs during the early lease years will lead to decreased profitability. The primary focus has centered on how the adoption of the standard affects the balance sheet, primarily because of a notable surge in fixed assets and lease-related obligations. The most prominent effects on the balance sheet were identified within the aviation industry, retail sector, and hotel industry.

While authors agree that the change has negative impact of leverage and current ratio, there is no agreement on whether change has positive, negative, or has no effect on market capitalization of companies (Gligoric et al., 2019). In that sense, Chung (2022) asserts that the implementation of IFRS 16 has a detrimental effect on financial health metrics. This adverse impact arises from the reclassification of operating to finance leases, consequently inflating the entity's lease liabilities. The same authors claim that this surge in leverage ratios diminishes the attractiveness of entities engaged in operating leases by constraining their access to future financing opportunities and heightening the risk of violating obligations related to the company's liabilities. Conversely, Honny et al. (2022) assert that the leverage ratios resulting from the adoption of IFRS 16 do not exert any influence on the entity's value. Authors claim that the entity's value remains unaffected in this process, as entities have already made their decision regarding reclassification. On the other hand, Agyei-Boapeah et al. (2020) affirms that the introduction of new IFRS 16 adoption enhances entity value in countries with mature financial markets. This enhancement can be ascribed to the diminishment of information asymmetry between owners and the management of the entity, along with the improved availability of external funding. The research results indicate that there is a favorable connection between the rise in lease amounts according to PSAK 73 (IFRS 16 adoption) and firm value in Indonesia throughout the pandemic COVID-19. Furthermore, the study uncovers an adverse association between lease amounts under the previous standard and entity value before the pandemic occurred (Nugroho & Gantyowati, 2023). On the contrary, Lau (2023) reports that from 2011 (right after the initial exposure draft that led to IFRS 16) to 2018 (just before IFRS 16 became effective), there was a decline in operating lease intensity. Furthermore, it observes that variations in operating lease amount during 2011 to 2018 are influenced by gearing, aligning with the debt agreement hypothesis.

To summarize, the consequences of adopting IFRS 16 can vary depending on the nature of operating lease contracts or industry, yet they consistently exhibit significant effects, as highlighted in various studies. These effects encompass (Dayag et al., 2023):

- A rise in financial liabilities, owing to the recognition of lease liabilities that equal to the present value of future payments (Sacarin, 2017; Maali, 2018; Yu, 2019);
- A decrease in return on assets (ROA) as a result of the increase of total amount of assets, as indicated by research conducted by (Tai, 2013; Wong & Joshi, 2015; Nuryani et al., 2015; Ozturk & Sercemeli, 2016; Joubert et al., 2017; Veverkova, 2019; Raoli, 2021);
- An increase in the debt-equity ratio due to the increase of total amount of liabilities (Wong & Joshi, 2015; Nuryani et al., 2015; Ozturk & Sercemeli, 2016; Magli et al., 2018; Morales-Diaz & Zamora-Ramirez, 2018a); and
- An increase in EBITDA resulting from the increase of depreciation and interest expenses in place of lease expenses (Stancheva-Todorova & Velinova-Sokolova, 2019).

These effects are anticipated to be more pronounced in industries that heavily depend on operating leases and, consequently, in entities that extensively incorporate such leases into their operations, as noted in (Karwowski, 2018).

### 3. CONCLUSION

In summary, the shift to IFRS 16 in the hotel industry represents a significant transformation in lease accounting practices, with far-reaching implications. Proper implementation is paramount for accurate financial reporting and transparent communication with stakeholders. It's worth noting that the standard IFRS 16 was issued on January 13<sup>rd</sup>, 2016, and became effective on January 1<sup>st</sup>, 2019, with mandatory application in the Republic of Serbia starting from January 1<sup>st</sup>, 2021. The primary challenge for hotels is to strike a balance between their dedication to delivering exceptional guest experiences and the precision required by IFRS 16. The intricacies of hotel lease agreements, often involving service components that contribute to guest satisfaction, must be accounted for in a manner that maintains transparency and meets financial reporting obligations. Future work might revolve around determining impacts of the use of IFRS 16 on financial ratios of selected hotel businesses.





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## PAPERS FROM THE THEMATIC AREAS OF THE CONFERENCE







## PAPERS FROM THE THEMATIC AREAS OF THE CONFERENCE

There are 15 papers related to the thematic areas of the conference. Authors' research interests were related to Corporate Finance (1), Business Finance (1), Banking (1), Accounting (1), Circular Economy (1), Human Resources Management (6), and Marketing and Management (4).

CORPORATE FINANCE section features a paper that investigates the relationship between the International Monetary Fund (IMF), a prominent global financial institution specializing in economic issues and aiding countries facing financial challenges, and Serbia. The primary focus of the paper is to analyze the credit agreements between Serbia and the IMF and assess their influence on the country's economic circumstances. Specifically, the paper investigates the Stand-by Credit Arrangements utilized by the Republic of Serbia in 2011, 2015, and 2022. The research delves into various aspects, including IMF-imposed conditions, the extent of credit arrangements, policies and measures encompassed within these agreements, and their repercussions on macroeconomic stability, fiscal and monetary policies, structural reforms, and other pertinent economic indicators. The paper aims to comprehend the lasting effects of these programs on Serbia and evaluate the collaborative relationship between the country and the IMF.

Paper in the field of BUSINESS FINANCE notes that the COVID-19 pandemic has affected the entire world economy and almost all industries. The paper also notes that, unlike most industries, some industries show higher sales volume, profitability and growth. One such branch of the economy is the organic food industry. The goal of the paper is to determine the liquidity of companies operating on the organic market. For this purpose, the liquidity ratio of 20 business entities for the period from 2019 to 2022 was calculated. The results of the research showed that COVID-19 had an effect on increasing the liquidity of the analyzed companies.

A paper in the field of BANKING notes that when consequences of global warming are manifested in the form of various and increasingly frequent natural disasters, both at global and national level, it is increasingly clear that sustainable development is becoming imperative for survival and development of society and economy. The authors suggest that the starting point for achieving sustainable development is harmonizing the economic activity of society and the economy with the ecological dimension of society. Green finance, which encourages

and supports green projects that include procurement of energy-efficient equipment, and production of clean energy, plays a very important role in the overall sustainable development. The authors analyzed the green finance that includes purchasing energy-efficient equipment in Serbia, to determine their impact on the management of sustainable development.

ACCOUNTING section features a paper that suggests that businesses are increasingly required to disclose sustainability-related financial information as a response to global sustainability challenges, such as climate change, social inequality, and environmental degradation. The paper discusses the growing importance of environmental accounting and reporting for companies globally, and consumers' environmental behavior focusing on a case study in Montenegro. This study proposes that there exists a positive correlation between the escalating standards and demands for Environmental, Social, and Governance (ESG) reporting by companies and the active engagement of consumers in understanding and fostering a more eco-friendly and sustainable future. By applying interdisciplinary approach, the paper aims to examine whether there is a relationship between the increasing stringency of ESG reporting standards for businesses and the heightened awareness among consumers regarding the significance of sustainability, leading to their active participation in advancing a more environmentally responsible future.

Paper in the CIRCULAR ECONOMY field emphasizes that while stakeholders and policy makers in industry and academia increasingly use circular and sustainable, the terms are not clearly understood. Furthermore, the paper notes that the need for a switch from a current economic model (linear) to the circular one has been recognized globally by the major decision-makers. The paper suggests that the shift from one mechanism to another has presented challenges in grasping the Circular Economy (CE) and Sustainability (S) principles: defining them, understanding the similarities and differences, and successfully applying them using Triple Bottom Line (TBL) approach. Employing systematic literature review, the paper aims to clarify and explore the concepts and the relationship of CE and S by applying TBL framework – social, economic, and environmental variables. The paper identifies the gaps regarding relations to people and profit contribution in the literature and recommends future research priorities and new frameworks.



There are six papers in the HUMAN RESOURCES MANAGEMENT section. The first paper notes that there has been a significant increase in the focus on creativity, driven by major changes in the business environment, such as heightened global market competition. This has consequently contributed to ever-increasing job complexity and workforce mobility. The paper shows that HRM plays a pivotal role in fostering creativity in an IT organization. This role is complex since it involves supplying the organization with the most important asset, human capital that proves necessary for survival in the highly competitive IT sector, the fastest-growing industry worldwide.

The second paper recognizes that, due to the dynamic development of technology, the knowledge economy, and the overall improvement of the quality of life, new concepts have inevitably emerged in business practices within human resource management. The paper addresses topics such as employment, the work of employees in a harmonious company environment, and the creation of opportunities for personal expression and progress, both on an individual and professional level. The paper suggests that globalization, unemployment, employee diversity, business liberalization, restructuring, and market saturation, coupled with technological advancements, have resulted in a global scenario with a large number of employers seeking talented candidates. Both companies and workers have significant opportunities but also face intense competition.

The third paper notes that the pandemic has forced organizations to focus on strengthening their sustainability. As a measure of modern business success, organizational sustainability is affected by diverse factors. Nevertheless, the authors have only recently begun to examine the link between servant leadership and organizational sustainability. Servant leaders possess the know-how needed to successfully manage the complexities of organizational sustainability. In particular, environmentally specific servant leaders encourage pro-green outcomes in their organizations. This paper provides an overview of seven empirical studies which evaluate the effect of servant leadership and environmentally specific servant leadership on sustainability in organizations.

The fourth paper emphasizes the strategic role of human resources. Since the basic problem of human resources management is the lack of quantitative indicators and the causal relationship between investment in people

and yield, the authors perceive this as a space for a set of indicators of quality of HR policies and practice. The paper outlines the theoretical basics of human resources management, presents the key indicators of the quality of HRM activities, as well as the discipline of human resources accounting. The results of the research show that there is an insufficient development of human resources management in relation to the EU and countries in the region, but they show a tendency for improvement.

The fifth paper implies that in the fast-paced world of IT recruitment, the significance of employer branding has grown immensely. This paper explores the substantial impact of employer branding on the hiring of IT professionals. Faced with a competitive market and a continuous demand for skilled IT talent, organizations must distinguish themselves to attract top candidates. This research investigates how a well-defined employer brand can significantly impact the recruitment process in the IT sector. It explores the critical elements of an effective employer brand, such as the company's mission, values, work culture, and employee value proposition (EVP). Furthermore, it delves into the strategies and communication channels that resonate with IT professionals, emphasizing the importance of online platforms and IT-specialized recruitment methods. The findings highlight the strong link between a robust employer brand and successful IT recruitment, revealing effective strategies for securing top talent in a competitive landscape.

The sixth paper elaborates on an innovative practice within EY company. EY Badges and Degrees represent a modern education program, embraced by a visionary global entity. In a world where change is the only constant and the horizon of knowledge keeps shifting, the EY learning program stands as a beacon that defies convention and ushers in an era of lifelong learning like no other. It is a genuine perpetual evolution with no boundaries worldwide. Amidst the bustling realm of business, EY recognizes its most precious asset - human capital. It encourages people to step beyond their comfort zone, in order to explore uncharted realms of learning. And what is the reward for this bold journey? It is knowledge, a badge of honor, and a globally recognized testament to the dedication to professional and personal growth. It is a narrative where an organization does not just provide a service but nurtures personal aspirations, fuels career ambitions,



and weaves success stories. Navigating the world of EY Badges and Degrees is a genuine partnership, a journey where EY doesn't just guide but propels. It is a world where investment is in minds, vision, and consequently, in the future of its participants.

There are four papers in the MARKETING and MANAGEMENT section. The first paper suggests that empowering employees is a key factor in organizational success, as it boosts motivation and improves individual performance. The paper aims to determine the link between employee empowerment and customer satisfaction as well as sales performance. Sixty ( $n = 60$ ) employees of a renowned insurance company in Serbia completed two surveys. Data was collected through the use of surveys digitally delivered to participants. The findings of this study show a positive relationship between employee empowerment and customer satisfaction. Empowered employees demonstrate a greater sense of ownership and responsibility, leading to improved customer interactions and increased satisfaction levels. The results highlight the key role of the employee empowerment in achieving customer satisfaction and sales performance.

The second paper provides insights into the psychological and social aspects of the 'eco-guilty pleasure' paradox, consumer behavior that contradicts their sustainability awareness. The paper aims to understand why individuals often persist in unsustainable consumer practices despite being aware of their negative environmental impact. By examining relevant theories and research in the field of consumer psychology and behavior, this study offers a deeper understanding of the factors shaping such behavior and proposes strategies for changing unsustainable habits to preserve the environment. Understanding the psychological and social mechanisms behind the 'eco-guilty pleasure' phenomenon contributes to the development of effective strategies that encourage consumers to adopt sustainable consumption habits.

The third paper aims to examine how travel influencers not only stimulate travel but also influence tourists' behavior, particularly in the context of sustainability. The goal is to understand the extent to which these influencers shape tourists' preferences for sustainable travel, encompassing choices related to eco-friendly destinations, responsible itinerary planning, environmentally conscious lodging selections, and sustainable activity preferences.

Furthermore, this paper scrutinizes the perceived credibility and trustworthiness of travel influencers among tourists and explores their potential role in shaping eco-conscious attitudes. By gaining a comprehensive understanding of how travel influencers impact tourists' sustainable behavior, industry stakeholders can devise more effective marketing strategies and cultivate collaborations that cater to the distinctive preferences and concerns of this target audience within the tourism sector.

The fourth paper investigates the dynamics and challenges faced by strategic investors in the context of Artificial Intelligence (AI) startups. As the landscape of financial markets evolves, strategic investments in AI startups have gained considerable attention due to their potential for disruptive innovation and substantial returns. However, the unique characteristics of AI ventures pose distinctive challenges to investors, necessitating a comprehensive understanding of the underlying factors that shape the investment landscape. Drawing on literature review analysis, this paper explores the strategic decision-making processes, investment strategies, and performance outcomes of strategic investors in the AI startup ecosystem. The paper uncovers the key determinants that influence the success or failure of strategic investments in AI startups, including the evaluation of technological capabilities, market potential, business models, and strategic alignments. The findings provide valuable insights for both investors and entrepreneurs, offering guidance on effective strategies for navigating the complex landscape of AI investments.



# THE SIGNIFICANCE OF INTERNATIONAL MONETARY FUND CREDIT ARRANGEMENTS IN FOSTERING THE SUSTAINABLE DEVELOPMENT OF THE REPUBLIC OF SERBIA

Tijana Radojević<sup>1\*</sup>,  
Danica Rajin<sup>2</sup>,  
Jelena Nikolić<sup>1</sup>,  
Ričardas Butėnas<sup>3</sup>

<sup>1</sup>Singidunum University,  
Belgrade, Serbia

<sup>2</sup>FEFA,  
Belgrade, Serbia

<sup>3</sup>Kauno Kolegija, University of  
Applied Sciences,  
Kaunas, Lithuania

## Abstract:

This paper explores the relationship between the International Monetary Fund (IMF), a prominent global financial institution specializing in economic issues and aiding countries facing financial challenges, and Serbia. The primary focus of this study is to analyze the credit agreements between Serbia and the IMF and assess their influence on the country's economic circumstances. Specifically, it investigates the Stand-by Credit Arrangements utilized by the Republic of Serbia in 2011, 2015, and 2022. The research delves into various aspects, including IMF-imposed conditions, the extent of credit arrangements, policies and measures encompassed within these agreements, and their repercussions on macroeconomic stability, fiscal and monetary policies, structural reforms, and other pertinent economic indicators. This study's overarching objective is to comprehend the lasting effects of these programs on Serbia and evaluate the collaborative relationship between the country and the IMF.

## Keywords:

credit arrangement, IMF, macroeconomic stability, structural reforms.

## 1. INTRODUCTION

The inception of the International Monetary Fund dates back to the 1944 Bretton Woods conference, in which the Socialist Federal Republic of Yugoslavia (SFRY) was a participant (Radojević, 2022). Our collaboration with this institution has its roots in that historic event. The primary objectives of the International Monetary Fund system encompass fostering international monetary cooperation, facilitating the growth of global trade and economies, and discouraging policies that may hinder overall prosperity (Hackler, Hefner and Witte, 2020).

Financing of the Fund is done through quotas. It is the amount that each member country pays, expressed in Special Drawing Rights (SDR), and on the basis of which it is determined how many financial resources the member country can use from the Fund in case of need, as well as how much SPV will be allocated to the member country. Quota determinations take into account several pivotal factors, including: gross domestic product (GDP), international trade volumes, foreign exchange reserves, and the overall financial stability of a country.

The credit arrangements offered by the IMF to member countries are diverse and depend on the needs and problems that the member country has at a given time (Kozomara, 2019). In order for the program within the credit arrangement to be adequately implemented, the IMF carries out missions to monitor the progress and development of the program and to identify potential problems in the implementation of certain policies and provide advice to member countries (Lütz and Hilgers, 2019).

Correspondence:  
Tijana Radojević

e-mail:  
tradojevic@singidunum.ac.rs





## 2. CREDIT AGREEMENTS OFFERED BY THE INTERNATIONAL MONETARY FUND (IMF)

The IMF approves short- and medium-term loans to member countries to overcome balance of payments difficulties. The amount of funds that a member country can withdraw depends on its participation in the Fund's credit potential - what the member country's quota is (Hadžić, 2021).

There are the following types of credit arrangements (Stakić, 2014):

- Unprivileged loans: Stand-By Arrangement, Flexible Credit Line, Extended Fund Facility;
- Preferential loans: Extended Credit Facility, Stand-By Credit Facility, Accelerated Lending Mechanism;
- Emergency Financial Assistance: Emergency Assistance, Precautionary Line of Credit, Disaster Relief;
- Exceptional Debt Assistance: Initiative to assist heavily indebted low-income nations, Multilateral Relief Initiative.

## 3. IMF CREDIT AGREEMENTS FOR THE SUSTAINABLE DEVELOPMENT OF THE REPUBLIC OF SERBIA

Throughout the extensive history of collaboration between the Republic of Serbia and the International Monetary Fund, which initially began within the former SFRY and continued as the independent state of the Republic of Serbia, numerous credit arrangements were sanctioned and proved effective in assisting Serbia in addressing specific challenges that emerged during different periods (Nikolić, 2022).

The most common types of credit arrangements used within this cooperation are stand-by loans and flexible credit line - FCL. The first Credit Arrangement between Serbia and the IMF was signed in 1981. During that period, Serbia was a constituent of the Socialist Federal Republic of Yugoslavia and encountered economic difficulties. A particularly significant Credit Arrangement

between Serbia and the IMF took place in 2009. During one such instance, Serbia grappled with the repercussions of the global financial crisis, necessitating essential fiscal adjustments. It is also important to mention the Flexible Credit Line (FCL) that Serbia received from the IMF in 2015. The FCL was a special instrument that gave Serbia the flexibility to use available funds as needed, without the obligation to implement certain policies in exchange for financial support. This paper analyzes the last three Stand-by Credit Arrangements from 2011, 2015 and 2022, as well as the conditions from these arrangements and their impact on the Serbian economy.

### 3.1. STAND-BY CREDIT ARRANGEMENT FROM 2011

On September 29<sup>th</sup>, 2011, a precautionary eighteen-month Stand-by Arrangement was granted, amounting to 935.4 million special drawing rights (approximately 1,076.75 million euros), which equaled 200% of the quota (IMF Press Release No.11/353, 2011). This program aimed to uphold balance in macroeconomics and financial resilience, safeguard against extraneous disruptions, reinforce fiscal responsibility, and address issues concerning the investment climate to stimulate job creation.

During that time, Serbia's economic condition was comparatively better than in the period following the 2008-2009 crisis. Nonetheless, there were lingering challenges, including a negative trade shock resulting in reduced demand for steel, labor market vulnerabilities with high unemployment rates in the private sector, limited foreign exchange interventions due to market volatility, and inflation peaking at nearly 15%.

The initial reconsideration of the package in February 2012 did not yield positive outcomes because it deviated from the defined fiscal program, resulting in the non-utilization of the approved funds (Relations with the International Monetary Fund, 2023). The conclusion of the initial assessment within the framework of the Stand-By Arrangement faced delays due to discrepancies in the 2012 budget, particularly related to the increased planned issuance of public debt (including government guarantees) and domestically funded projects. The mission's primary focus was on the fiscal policy for the year 2012 (IMF Press Release No.12/45, 2012).

Table 1. Serbia's Stand-by Credit Arrangements with the IMF.

Type of credit arrangement	Date of arrangement	Expiration date	Amount approved (SDR Million)	Amount Drawn (SDR Million)
Stand-By	19.12.2022	18.12.2024	1,898.92	949.46
Stand-By	23.02.2015	22.02.2018	935.40	0
Stand-By	29.09.2011	28.03.2013	935.40	0

Source: <https://www.imf.org/external/np/fin/tad/exfin2.aspx?memberKey1=1072&date1key=2099-12-31>



In September 2012, during the subsequent mission, it was observed that Serbia's economic situation had been severely affected by significant internal and external imbalances. Anticipated GDP decline, inflation acceleration due to food price shocks, substantial increases in public spending, and a double-digit deficit relative to the 2012 budget were expected to push the public debt ratio beyond 60% of GDP, leading to a country rating downgrade. Given this situation, it became imperative to curtail spending before approving the 2012 budget rebalancing and swiftly implement a clear and realistic medium-term fiscal consolidation plan aimed at reducing the public debt below 45% of the Gross Domestic Product (GDP). Although the government's deficit target for 2013 was deemed broadly appropriate, significant additional measures were necessary for its achievement. The mission also underscored the importance of corrective actions to bolster the independence of the Serbian Central bank, which had been undermined by recent amendments to the NBS law (IMF Press Release No.11/353, 2011). Furthermore, during the IMF mission in November of the same year, fiscal consolidation was highlighted as the most critical measure to safeguard Serbia's economic stability.

### 3.2. STAND-BY CREDIT ARRANGEMENT FROM 2015

Stand-by Arrangement was approved on February 23<sup>rd</sup>, 2015 and was granted for a 36-month period, amounting to 935.4 million special drawing rights, equivalent to approximately 1,168.5 million euros. This arrangement was established as a precautionary measure, signifying the intent to utilize the approved funds solely in case of balance of payments needs (Relations with the International Monetary Fund, 2023). The program revolved around three primary pillars: the restoration of fiscal health, the enhancement of financial zone balance and flexibility and the comprehensive implementation of systemic rehabilitation to lay a robust basis for fostering employment opportunities and maintaining long-term, sustainable growth (IMF Press Release No.15/67, 2015).

Serbia's economy at that juncture remained vulnerable, still grappling with the aftermath of the significant floods of 2014, which had led to a GDP decline, decreased domestic demand, and subdued economic activity among trading partners. The 2014 recession marked the third consecutive one in the last six years, with a public debt reaching 70% of GDP and a fiscal deficit of 6.6%. High unemployment remained as a persistent issue, as seen in the previous years.

The IMF closely monitored the Credit Arrangement through eight missions of its Executive Board, culminating in the following conclusion after the assessment of Serbia's economic achievement in its eighth revision:

- On December 20<sup>th</sup>, 2017, the Executive Board of the International Monetary Fund (IMF) ended the eighth revision of Serbia's economic achievement under the Stand-By Arrangement (SBA). With the finalization of this revision, a cumulative sum of SDR 880.835 million (approximately EUR 1.05 billion) became available. Serbia made notable strides within the economic program supported by the Fund. Economic assurance saw an uptick, with a significant reduction in public debt and a strengthened external reputation and investments and improvement exhibited resilience, accompanied by improvements in labor market conditions. Substantial progress was also observed in the implementation of the constitutional reform program. It was recommended to maintain reasonable policies and advance institutional improvements, particularly the extensive ones. The 2018 budget allowed for some tax reductions to promote employment. The demonstrated exchange rate flexibility was commended, returning Serbia's enhanced basis and market circumstances. Financial section improvement implemented as a part of the program enhanced the flexibility of banks, positioning them to better support the economy. Efforts to reduce non-performing loans yielded positive results and were encouraged to be pursued, although rehabilitations of national financial organizations needed acceleration. The improved macroeconomic stability and regulatory environment contributed to an enhanced business environment in Serbia (IMF Press Release No.17/515, 2017).

This loan arrangement was concluded successfully on February 22<sup>nd</sup>, 2018.

### 3.3. STAND-BY CREDIT ARRANGEMENT FROM 2022

On December 19<sup>th</sup>, 2022, the Board of Executive Directors of the International Monetary Fund authorized a 24-month Stand-by Arrangement for the Republic of Serbia, amounting to 290% of our country's quota in this international financial institution, which equals approximately 1.89 billion special drawing rights. This arrangement was put in place to support the agreed-upon economic program. It replaced the Policy Coordination Instrument and was designed with the adjustments to macroeconomic policies that consider the current global challenges, built upon previous achievements and the reform agenda. Under this Stand-by Arrangement, a portion of the total funds is scheduled for withdrawal in 2022 and 2023, while the remaining portion will be held as precautionary funds. In this regard, on February 9<sup>th</sup>, 2023, the



National Assembly passed the Law on the Regulation of the Republic of Serbia's Obligations to the International Monetary Fund based on the use of funds from the Stand-by Arrangement authorized by the Board of Executive Directors of the International Monetary Fund on December 19<sup>th</sup>, 2022. The goals of the economic program endorsed by the Stand-by Arrangement for the Republic of Serbia, supported by the Stand-by Arrangement, include maintaining macroeconomic and financial stability through adjustments in response to the current economic challenges, enhancing resilience to the energy crisis through appropriate energy integrity and improvements, addressing national energy district threats while defending sensitive groups, and fostering high, environmentally friendly, inclusive, and sustainable growth through comprehensive structural reforms (Relations with the International Monetary Fund, 2023).

According to Article 2 of the Law on the Regulation of the Republic of Serbia's Obligations to the International Monetary Fund based on the use of Stand-by Arrangement funds approved by the Board of Executive Directors of the International Monetary Fund on December 19<sup>th</sup>, 2022, the funds can be utilized in 2023 in tranches. The first tranche amounts to 785.76 million SPV (equivalent to 120% of the quota), the second tranche is 163.7 million SPV (25% of the quota), and the third tranche can go up to a maximum of 316.53 million SPV (48.34% of the quota). The remaining funds from the Stand-by Arrangement are designated for precautionary purposes. These funds can be employed for direct budget financing, refinancing the Republic of Serbia's obligations, and covering current budgetary needs.

At the time of approving this Credit Arrangement, Serbia was in the process of recovering from the global pandemic, which had a comprehensive influence on the economy. While Serbia had made strides in its recovery, it was now contending with adverse events both regionally and globally. The ongoing disagreement among Russia and Ukraine was affecting the economy due to the energy crisis and rising food prices. Inflation was anticipated to approximately 12% in 2022, primarily driven by the increased food and energy costs. GDP growth was expected to slow to approximately 2.5% in 2022 due to weakened outward interest from EU trading organizations, added to factors such as higher energy fees, supply chain disarrangement, and scarcity, with further deceleration to 2.25% in 2023. The contemporary account deficit was predicted to rise to around 9% of GDP in both 2022 and 2023, owing to higher energy import expenses, reduced domestic electricity production, and weakened external demand. Despite these challenges in the global environment, Serbia maintained financial sector stability and a stable exchange rate (Jovović, 2022).

The biennial Stand-By Arrangement (SBA) provides specific guidance to address these issues (IMF Press Release No.22/447, 2022):

- Implement adjustments to energy tariffs and systemic improvements to reinstate the financial stability of national energy companies EPS and Srbijagas within two years, while safeguarding vulnerable households and offering short-term fiscal support to energy companies.
- Maintain a resolute monetary and fiscal strategy to manage inflation and keep exchange rate stability.
- Continue enhancing fiscal clarity and implementing budget improvements to uphold fiscal development and effectively implement the new fiscal rule.
- Sustain ongoing reforms aimed at strengthening management and supervision in state-owned enterprises.

## 4. THE IMPACT OF CREDIT ARRANGEMENTS ON THE ECONOMY OF SERBIA

### 4.1. EFFECTS OF THE CREDIT ARRANGEMENT FROM 2011

The Stand-by Credit Arrangement for 2011, which was supposed to last for 18 months, was frozen after only five months of its duration, after the first revision of the program in February 2012. Exceeded debt level was the reason for its freezing. The conduct of such a policy by the Republic of Serbia sent a message that it was not able to conduct a credible economic policy, which led to many negative consequences such as an increase in interest rates, a lower inflow of foreign investments as well as an imbalance in the foreign exchange market and the public debt market.

In the realm of structural reforms, there's a pressing need to shift the focus towards bolstering exports. It's imperative to enhance and broaden Serbia's export activities to foster robust growth, ensure external sustainability, stimulate job creation, and expedite the convergence of income levels with those of the European Union. Serbia's economy is constrained by an excess of regulations, a sizable and inefficient public enterprise sector, and a labor market characterized by rigidity and protectionism. Serbia's economic growth is hindered by the abundance of regulations, a large and ineffective public company sector, and a labor market marked by inflexibility and protectionist measures.





Therefore, the key priorities for policy reform encompass the following:

- **Regulatory Reforms:** The government should streamline business laws and regulations, intensify the analysis of the regulatory influence of contemporary legislation, improve charge and customs administration, and simplify the countryside registration and relocation processes.
- **Public Company Improvement:** The mission acknowledges the government's intent to expedite the privatization and capitalization plans of public companies, working in coordination with the World Bank. Additionally, there should be a focus on enhancing transparency in their effects, implementing accurate payment and recruitment strategies entrenched on performance standard, raising public utilities tariffs to cover costs, and imposing strict limitations on subsidies and guarantees to these enterprises.
- **Labor Market Reforms:** Urgent reforms are required in the labor market to stimulate the generation of new jobs within the private sector (IMF Mission concluding statement, 2013).

The effects of this program did not fully meet the desired framework, but the Republic of Serbia showed determination and desire to implement the measure and to progress the economy. Unemployment, budget deficit, public debt, inflation, and investment climate are still key problems, as they were at the beginning of this program in 2011.

#### 4.2. EFFECTS OF THE CREDIT ARRANGEMENT FROM 2015

On February 22<sup>nd</sup>, 2018, Serbia successfully completed a loan arrangement program worth 1.32 billion dollars with the IMF, lasting 36 months. The funds within this program were not used (they were used as a precaution). Serbia has fulfilled several goals set within the program, the effects of which we will investigate as part of the Executive Board's mission on the day the Credit Arrangement ends. *"The program recorded significantly better results than expected, exceeding many of its macroeconomic goals,"* said James Roof, head of the IMF team for Serbia. Fiscal balances, after the second largest deficit in Europe in 2014, achieved a surplus in 2017. Confidence in the economy improved thanks to increased investment from both foreign and domestic sources. The unemployment rate is near record lows and continues to fall. Banks are stable, and problem loans are currently below the pre-crisis levels (IMF News, 2018).

Nevertheless, it is necessary to maintain this kind of progress in the future. The government should focus on helping the country catch up with its Western European neighbors and prevent the outflow of skilled labor. The following measures should be observed (IMF News, 2018).

- Reform of institutions and public services,
- Reform of state-owned enterprises,
- Improving the business environment,
- Building better infrastructure.

#### 4.3. EFFECTS OF THE CREDIT ARRANGEMENT FROM 2022

This Credit Arrangement is relatively new and within it we only have the First Review, with the following conclusions (IMF Mission concluding statement, 2023):

- Serbian economy has shown resilience despite very unfavorable circumstances. However, the fiscal results for 2022 exceeded expectations, as did the results regarding the balance of current transactions and reserves. It is expected to grow by 3% in 2024 and return to 4% in the medium term.
- Inflation has surged to 16%, primarily driven by escalating food and energy costs. Basic inflation has risen further, reaching 11%, as it reflects the widespread transmission of cost-related pressures.
- Despite experiencing a larger deficit in the current account balance, substantial foreign direct investments and other financial inflows have empowered the Central Bank of Serbia to significantly augment its reserves since mid-2022.
- The fiscal deficit for the year 2022 proved to be substantially lower than initially anticipated when the Stand-By Arrangement (SBA) was adopted, standing at 3% above GDP. This was achieved even with fiscal support extended to state enterprises in the energy sector, amounting to around 2½% of GDP. The 2023 budget, aligned with the SBA's objectives, was ratified in December 2022. As a consequence of favorable fiscal outcomes, public debt was positioned at 55% of GDP at the close of 2022.
- The reform of the energy sector remains the focal point of the SBA's attention. These endeavors should be complemented by initiatives to expand the energy protection program for vulnerable customers and increase the proportion of households benefiting from reduced energy bills. We commend the authorities for their commitment to promptly transform the state-owned entity Elektroprivreda Srbije (EPS) into a joint-stock company and develop a strategic plan for EPS restructuring by the end of 2023.



- Reforms aimed at fortifying the rule of law, enhancing the competence of the judiciary, and combating exploitation are of paramount significance in enhancing the investment climate.

The effects of this Credit Arrangement will be visible in 2 years, when this Arrangement is completed, as foreseen by the program.

## 5. CONCLUSION

Credit Arrangements represent an important instrument of economic cooperation between Serbia and the IMF, which aims to provide financial support and promote economic reforms in the country. Through the analysis of available data, certain effects of these arrangements on the economy of Serbia have been observed. The first effect of Credit Arrangements was to achieve macroeconomic stability. The IMF extended financial assistance through loans to address the equilibrium of the balance of payments, uphold exchange rate stability, and secure liquidity within the market. This played a role in diminishing economic volatility and fostering trust among investors. Another effect was to encourage fiscal discipline and structural reforms. Under the credit arrangements, the IMF established prerequisites linked to reducing public debt, achieving fiscal consolidation, enhancing the management of public finances, and executing structural reforms. These reforms were imperative for state-owned enterprises, education, and healthcare sectors. Furthermore, there was a need for infrastructure development to elevate the investment climate and draw in substantial investors, a goal that was successfully achieved. The third effect was visible in sectors such as banking, financial markets and economic growth. Credit Arrangements have contributed to strengthening the banking sector, improving regulation and supervision, as well as encouraging foreign investment. Additionally, IMF assistance was extended with the objective to enhance economic competitiveness, broaden export diversity, and mitigate structural imbalances. There was a stable exchange rate, record low interest rates, and favorable loans for all citizens. The most important measure within this sector was solving the problem of non-performing loans (NPL), which was achieved.

Today, Serbia is facing a successful post-Covid recovery, but it is affected by other things that have followed it, namely the energy crisis and instability at the global and regional level. For this reason, Serbia has decided on a Stand-by Credit Arrangement, from where it will withdraw certain funds within the first three tranches, and the rest will be used as a precaution. Within this program, the energy crisis should be solved by reducing energy imports and increasing production. Also, it is necessary to encourage citizens to reduce the consumption of electricity, which is foreseen by certain measures within the framework of the arrangement.

In conclusion, it can be pointed out that the Credit Arrangements between Serbia and the IMF had a significant impact on the country's economy. However, it is important to properly assess their effectiveness, as well as to implement the necessary measures to ensure a sustainable economic future for the country. Continuous cooperation between Serbia and the IMF can be the key to achieving economic goals and improving the living standard of citizens.

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# LIQUIDITY AND DECISIONS AND CHARACTERISTICS OF MANAGERS OF ORGANIC COMPANIES DURING COVID-19

Vladimir Mitić<sup>\*1</sup>,  
Milica Čolović<sup>2</sup>,  
Marko Milojević<sup>2</sup>

<sup>1</sup>PhD candidate,  
Singidunum University,  
Belgrade, Serbia

<sup>2</sup>Singidunum University,  
Belgrade, Serbia

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## Abstract:

The COVID-19 pandemic has affected the entire world economy and almost all industries. However, unlike most industries, some industries show higher sales volume, profitability and growth. One of such branches of the economy is the organic food industry. The goal of the conducted research is to determine the liquidity of companies operating on the organic market. For this purpose, the liquidity ratio of 20 business entities for the period from 2019 to 2022 will be calculated. The results of the research showed that COVID-19 had an effect on increasing the liquidity of the analyzed companies.

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## Keywords:

liquidity, manager characteristics, organic food.

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## 1. INTRODUCTION

More and more attention is being paid to sustainable development in order to meet human needs without endangering natural systems and the environment. One of the important characteristics of organic production is that it takes care of the protection of natural ecosystems and food safety, so a large number of both developed and less developed countries have long-term plans for the development of this aspect of sustainable economy. The organic food market shows constant growth and its value has increased several times in this century (Bazaluk, et al., 2020; Froehlich et al., 2018). The organic food market has increased by 15% since 2019 when its value was 106 billion dollars (IFOAM, 2021) and reached a value of 129 billion dollars in 2022 (IFOAM, 2022). There is a constant growth in the sale of organic products on the international market (over 11% in 2020), as well as a tendency to increase the demand for organic products in the following years as well (Eberle et al., 2022). Germany is in the first place in terms of the value of the organic food market in Europe (about 15 billion euros), in the second place is France (12.7 billion euros), while Italy is in the third place (3.9 billion euros) (IFOAM, 2022 ).

The main motivations of consumers for buying organic food are health and concern for the protection of the environment and animal welfare (Čolović & Mitić, 2023; Ditlevsen et al., 2019; Scalvedi & Saba, 2018), while the biggest obstacles are high price and unavailability or poor supply of organic products (Čolović & Mitić, 2021; Čendić & Zarić, 2019; Smiglak-Krajevská & Vojčehovská-Solis, 2021).

Correspondence:  
Vladimir Mitić

e-mail:  
vmitic@singidunum.ac.rs





Organic customers are mostly women, have a higher level of education and above average income, are older and live in urban areas (Dašić et al., 2019; Dumortier et al., 2017; Đokić et al., 2014; Mitić & Čolović, 2022a; Mitić & Čolović, 2022b; Rizzo et al., 2020). Quality and safe food at a reasonable price enables the growth of the organic market and the growth of the value of buying organic food (Radojević et al., 2021). However, a large percentage of consumers on the Serbian organic food market still do not decide to buy organic products, so there is a lot of room for the development of this market and the growth of sales of these products (Dašić et al., 2019; Kranjac et al., 2017; Mitić & Čolović, 2022b; Tankosić et al., 2022).

During the COVID-19 pandemic, there were significant changes in the financial characteristics of most companies, as well as their business practices, in order to adapt to the given circumstances. Almost all industries suffered more or less damage (Budda et al., 2020), although some showed increased profits due to the effects of the pandemic. However, small businesses engaged in agriculture, construction, trade, and IT research show better financial performance under the impact of COVID-19 (Achim et al., 2022). Also, companies engaged in the production of organic food record an increase in sales directly or online and an increase in the number of consumers who buy organic food during the COVID-19 pandemic (Mitić & Čolović, 2023a). Also, these companies report an increase in the level of profitability due to the effects of the COVID-19 pandemic (Mitić & Čolović, 2023b). A sample survey of the impact of COVID-19 on the solvency of 12,387 non-financial listed companies in 15 EU member states showed that manufacturing, mining and retail firms are vulnerable to liquidity problems due to falling market capitalization (Mirza et al. 2020).

The impact of COVID-19 has led to a reduced level of sales and volume of business for a large number of companies from other industries, which results in less cash flow and, therefore, difficulties in meeting obligations. The repercussions of that are that company managers have encountered major problems in maintaining an adequate level of company liquidity (Almeida, 2021). Insolvency can significantly affect the company's operations, as they may lose some discounts and financial benefits from their business partners due to delays in settling obligations (Knežević et al., 2017). In this way, illiquidity spreads through the economic system, creating major problems for companies and leading to the illiquidity of entire sectors. Therefore, companies must take care to be liquid in order to be able to operate smoothly on the market, i.e. to monitor cash inflows and outflows.

The decision on the amount of net working assets is of great importance for achieving the financial balance of the company, because it is related to the financial performance of the company and to the level of risk that the

management is ready to accept according to the results of numerous researches (Banos-Caballero et al., 2016; Panda & Nanda, 2018; Rus & Achim, 2020; Rizvi et al., 2020).

Except for these factors, the very characteristics of managers can affect the liquidity of companies. Managers who are less risk-averse will insist on more liquidity, although this can significantly reduce the company's profits. It is highly likely that these managers have fixed incomes, that is, they do not have bonuses or company shares, so they are not ready to jeopardize their position and take risks (Barjaktarović et al., 2021). Unlike them, managers who tend to accept risks will keep the company's liquidity at a low level, so that the profit will be higher, especially if they also have a personal benefit from it.

## 2. METHODOLOGY

This paper will examine the extent to which the COVID-19 pandemic has affected the liquidity of organic market companies. The liquidity of companies will be determined on the basis of: general liquidity ratio, reduced liquidity ratio, current liquidity ratio and net working assets. The research hypotheses are that due to the COVID-19 pandemic, there was an increase in the general liquidity ratio (H1), the reduced liquidity ratio (H2), the current liquidity ratio (H3), as well as an increase in the net working assets of companies on the organic market (H4). Financial reports for the period from 2019 to 2022, downloaded from the website of the Agency for Economic Registers, will be used to calculate liquidity indicators. The research was conducted on a sample of twenty organic food producers, which means that this research will be based on 80 observations. Descriptive statistics will be used to display the results for better visibility and easier monitoring of existing trends.

## 3. RESULTS AND DISCUSSION

The general liquidity ratio shows the extent to which short-term liabilities are covered by current assets. The values of this liquidity indicator for twenty companies operating on the organic market in the Republic of Serbia are present in Table 1.

**Table 1.** The general liquidity ratio results for organic companies.

	2019	2020	2021	2022
"3. MART" DOO	1.14	1.15	1.31	1.02
"ACM INT" DOO	0.10	0.19	0.18	0.14
"A&D PHARMA" DOO	0.67	1.57	3.15	3.11
"AFC" DOO	8.68	4.60	4.85	3.02
"AGENCIJA ENOLOG" DOO	7.91	7.08	10.31	8.78
"AGRO DOMESTICA" DOO	1.47	1.60	1.38	1.64
"AGRO-BIS" STPR	0.93	4.92	1.82	1.62
"AGROFROST" DOO	1.18	1.56	1.48	1.21
"AGROIMPEX" DOO	0.49	0.25	0.25	0.16
"AGROVEKS" DOO		1.98	0.38	3.49
"AKORN DISTRIBUTION" DOO	1.02	0.94	0.71	0.60
"AL RAWAFED SRBIJA" DOO	0.76	1.02	1.29	1.36
"ALL BERRIES" DOO	4.16	7.78	2.89	2.82
"ALL NATURAL FOODS" DOO	0.48	0.47	5.28	10
"ALTIVA" DOO	4.72	5.56	5.38	4.27
"AMOR LUKS" DOO	1.59	1.54	0.85	0.62
"APICASE HONEY" DOO	2.51	1.32	1.10	0.84
"ARHAR TEH" DOO			14.72	1.02
"ARI FRUCT" DOO	1.03	1.65	1.51	1.27
"ARONIJA VITA" DOO	1.42	2.08	1.78	6.25
"ATLANTIC BRANDS" DOO	1.19	1.07	1.09	1.10
Average	2.18	2.42	2.94	2.59

Source: Author's calculation.

By observing the obtained results, one can come to the conclusion that there is a partially positive trend of this indicator because its value is the lowest in the first two analyzed years (2.18 in 2019 and 2.42 in 2020). The best value of this indicator is in 2021, when it was 2.94, and then in 2022, when it was slightly lower and amounted to 2.59. In general, it can be said that the value of this ratio is at the required level, given that it is constantly above 2, which means that current assets are two or more times greater than short-term liabilities. This confirms the first hypothesis (H1) that the liquidity of organic companies operating on the organic food market in Serbia increased during the duration of COVID-19.

The reduced (rigorous) liquidity ratio shows the extent to which short-term liabilities are covered by current assets. This indicator is more rigorous than the general liquidity ratio because it excludes the most illiquid part of current assets, i.e. inventories. The coefficient of reduced liquidity for the analyzed companies are present in Table 2.

During the duration of the COVID-19 pandemic, there was an increase in the coefficient of reduced liquidity, which confirmed the second research hypothesis (H2). Namely, it can be observed that there is a positive trend of this indicator during the analyzed period. Thus, the value of this indicator from 2019, when it was 1.22, in the following year fell to 1.39, so that in 2021 it would be 1.50, and in 2022 it would have the best value of 1.59 (Table 2).



**Table 2.** The coefficient of reduced (rigorous) liquidity results for organic companies.

	2019	2020	2021	2022
"3. MART" DOO	0.47	0.50	0.08	0.39
"ACM INT" DOO	0.06	0.13	0.13	0.10
"A&D PHARMA" DOO	-1.15	0.34	2.18	1.67
"AFC" DOO	5.94	3.67	4.00	2.66
"AGENCIJA ENOLOG" DOO	5.79	5.21	7.89	7.20
"AGRO DOMESTICA" DOO			0.69	1.59
"AGRO-BIS" STPR	0.37	3.08	0.92	0.73
"AGROFROST" DOO	0.19	0.38	0.38	0.31
"AGROIMPEX" DOO	0.13	0.03	0.03	0.03
"AGROVEKS" DOO		1.98	0.38	1.38
"AKORN DISTRIBUTION" DOO	0.52	0.66	0.41	0.44
"AL RAWAFED SRBIJA" DOO	0.35	0.52	0.63	0.65
"ALL BERRIES" DOO	0.91	1.56	0.26	0.27
"ALL NATURAL FOODS" DOO	0.23	0.24	2.43	5.85
"ALTIVA" DOO	3.59	4.41	3.17	3.76
"AMOR LUKS" DOO	0.51	0.41	0.31	0.62
"APICASE HONEY" DOO	1.62	0.35	1.11	0.06
"ARHAR TEH" DOO			4.30	0.90
"ARI FRUCT" DOO	0.33	0.36	0.17	0.16
"ARONIJA VITA" DOO	0.98	1.70	0.95	3.71
"ATLANTIC BRANDS" DOO	1.05	0.88	0.90	0.90
Average	1.22	1.39	1.50	1.59

Source: Author's calculation.

Table 3 shows the values for the current liquidity ratio. This indicator shows how many dinars of cash and cash equivalents cover each dinar of due liabilities. This indicator represents the most rigorous test of liquidity.

During the duration of Covid-19, there was an increase in the coefficient of current liquidity, which confirmed the third hypothesis of the research (H3). The results present in Table 3 show that the value of this indicator was the lowest in 2019 when it was 0.34, and in 2020 it would increase to 0.40 with growth in the following year when it was 0.47. The value of this indicator is slightly lower in 2022 compared to 2021 and was 0.43, but it is higher than in the first years of the COVID-19 pandemic.

Net working assets is calculated by subtracting current assets from current liabilities. If the value of this indicator is positive, it means that part of the long-term sources of financing is used for financing working capital. The results of this indicator for the analyzed period are present in Table 4.

The last hypothesis (H4) in our research was confirmed stating that during the duration of the COVID-19 pandemic, companies on the Serbian organic food market increased the value of their net working assets. Namely, it can be noted that there is a positive trend of increasing net current assets and that their average value in 2019 was 62,654 dinars, and in 2020 it was 85,535 dinars. The best value of this indicator is in 2021, 133.089 dinars, or in 2022, when it was 145.218 dinars. Good cash flow management is very important, especially during crises like this one. A large number of indicators in business can indicate a lack of working capital, primarily cash, such as delays and postponement of payments, then delays in customer deliveries, low inventory levels, poor creditworthiness and the inability of companies to borrow from the market or borrow under unfavorable conditions, etc.

**Table 3.** The current liquidity ratio results for organic companies.

	2019	2020	2021	2022
"3. MART" DOO	0.13	0.43	0.32	0.32
"ACM INT" DOO	0.05	0.06	0.09	0.02
"A&D PHARMA" DOO	0.19	0.01	1.12	0.61
"AFC" DOO	2.74	0.18	0.36	0.13
"AGENCIJA ENOLOG" DOO	2.29	2.68	2.71	2.79
"AGRO DOMESTICA" DOO	0.14	0.22	0.69	0.70
"AGRO-BIS" STPR	0.01	0.59	0.04	0.00
"AGROFROST" DOO	0.00	0.18	0.04	0.15
"AGROIMPEX" DOO	0.09	0.01	0.01	0.00
"AGROVEKS" DOO		1.98	0.35	1.37
"AKORN DISTRIBUTION" DOO	0.02	0.01	0.00	0.01
"AL RAWAFED SRBIJA" DOO	0.07	0.14	0.09	0.15
"ALL BERRIES" DOO	0.00	0.21	0.00	0.00
"ALL NATURAL FOODS" DOO	0.00	0.01	0.06	0.02
"ALTIVA" DOO	0.47	0.70	0.12	1.55
"AMOR LUKS" DOO	0.02	0.03	0.01	0.00
"APICASE HONEY" DOO	0.08	0.27	0.05	0.02
"ARHAR TEH" DOO			3.50	0.00
"ARI FRUCT" DOO	0.00	0.03	0.01	0.01
"ARONIJA VITA" DOO	0.043	0.15	0.36	1.18
"ATLANTIC BRANDS" DOO	0.08	0.02	0.05	0.03
Average	0.34	0.40	0.47	0.43

Source: Author's calculation.

COVID-19 has influenced the managers of organic companies to avoid taking on a higher level of risk, that is, to keep liquidity at a high level even though it reduces the profitability of their companies. Given that market turbulence often occurs during the pandemic, managers do not have much time to make decisions, so it is more difficult to decide on business risks. In addition, strong competition in the industry, rising energy prices and insufficient profits influence the management of the company to be very careful when making decisions.

As this pandemic has lasted for a very long time, in addition to the initial shock and fear that prevailed among all managers, the need for sensations and the desire for innovation and the desire to take risks have slowly re-emerged among people who have a pronounced tendency to seek sensations, which is the largest number of managers. In those conditions, the biggest profit for the companies is made by the type of managers who are not stifled by such a passive state and who in earlier years got used to a turbulent business environment, various oscillations, risky business, etc. On the other hand, the situation with

the pandemic was to some extent in the hands of managers who tend to maintain the status quo in their business. These managers did well in situations where they had clear and precise experiences of clear rules and procedures that were imposed on them due to the pandemic. In the new conditions, these managers were able to manage their business well without large fluctuations, and therefore with high liquidity. The situation now favors innovative leaders, those who look to the future and have a proactive role in business.

#### 4. CONCLUSION

Despite the COVID-19, the organic market is experiencing growth, unlike a large number of companies from other industries that are experiencing a drop in profits and a reduced level of sales. Given that a large number of companies and consumers are present on this market, it is constantly in the public eye and is the subject of many studies. In this paper, a survey of the level of liquidity for

**Table 4.** Value of net working assets for organic companies.

	2019	2020	2021	2022
"3. MART" DOO	5805	5194	20917	1158
"ACM INT" DOO	-292851	-264931	-255490	-283524
"A&D PHARMA" DOO	-7632	14720	132380	148775
"AFC" DOO	118689	141018	143920	164454
"AGENCIJA ENOLOG" DOO	9075	10994	9204	9047
"AGRO DOMESTICA" DOO	533	711	719	1041
"AGRO-BIS" STPR	-6611	72138	82307	90815
"AGROFROST" DOO	105737	240231	314856	232509
"AGROIMPEX" DOO	-2338	-4159	-3997	-4999
"AGROVEKS" DOO	46	59	-48	726
"AKORN DISTRIBUTION" DOO	965	-2455	-14560	-20949
"AL RAWAFED SRBIJA" DOO	-499701	27087	617228	802972
"ALL BERRIES" DOO	307077	336552	272591	283684
"ALL NATURAL FOODS" DOO	-72455	-75942	46038	46242
"ALTIVA" DOO	323586	332940	353548	367234
"AMOR LUKS" DOO	20354	24038	-8902	-27815
"APICASE HONEY" DOO	14928	14314	11409	-14440
"ARHAR TEH" DOO			6327	822
"ARI FRUCT" DOO	13329	323818	392261	297857
"ARONIJA VITA" DOO	2477	5833	5659	17102
"ATLANTIC BRANDS" DOO	1212071	508545	668516	936882
Average	62654	85535	133089	145218

Source: Author's calculation.

organic companies in Serbia was conducted. Monitoring liquidity is very important because if companies don't have enough cash to meet current liabilities, they can get into big trouble with suppliers and creditors. That is why it is necessary to monitor liquidity indicators so that management can react in time if there are any indications of illiquidity in the following period.

The research results showed that organic companies recorded positive growth in these indicators despite the pandemic, that is, they achieved a higher degree of liquidity. The research covered the period from 2019 to 2022 and analyzed indicators of general, reduced and rigorous liquidity as well as the level of net working capital for twenty companies on the organic market. Under the influence of COVID-19, there has been an increase in the number of buyers of organic food, which is why these companies are generating more cash flow. For most consumers, the main factor in making the decision to buy organic food is concern for their own health, as a result of which the purchase of organic food is becoming more frequent, which contributes to the growth of this market.

The current pandemic has been much more favorable to managers of organic companies who are ready to accept risks, who have a long-term vision of the company's development, who are innovative and accustomed to a turbulent business environment.

A potential limitation of the research may be the sample consisting of 20 companies operating in the organic market, so perhaps different results would be obtained with a larger sample. Future research may include a larger number of companies as well as markets in the surrounding area.



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# THE ROLE OF GREEN FINANCE IN THE MANAGEMENT OF SUSTAINABLE DEVELOPMENT IN SERBIA

Milena Nikolić\*,  
Danka Milojković

Singidunum University,  
Belgrade, Serbia

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## Abstract:

Nowadays, when consequences of global warming are manifested in the form of various and increasingly frequent natural disasters, both at global and national level, it is increasingly clear that sustainable development is becoming imperative for survival and development of society and economy. The starting point for achieving sustainable development is harmonizing the economic activity of society and the economy with the ecological dimension of society. Green finance, which encourages and supports green projects that include procurement of energy-efficient equipment, and production of clean energy, plays a very important role in the overall sustainable development. In this paper, the authors analyzed the green finance that includes purchasing energy-efficient equipment in Serbia, to determine their impact on the management of sustainable development.

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## Keywords:

green finance, EBRD, GEFF, sustainable development, Serbia.

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## 1. INTRODUCTION

Frequent natural disasters in the world and Serbia are clear indicators of the negative impact of human and economic activities on the environment. With increasingly frequent floods, earthquakes, storms, and droughts, climate change has become a part of everyday life and seriously affects people's lives and the entire economic activity development. The resulting damages and business interruptions harm the health and well-being of every person, but also the gross domestic product of the country affected by those damages (Ilić et al., 2020). It is becoming increasingly obvious that economic growth and development at the expense of environmental pollution is unsustainable and that the consequences of such unbalanced development on human health and economic activity are serious and far-reaching.

At the international and national level, numerous actors strive to reduce these negative consequences of global warming, which is manifested by the aforementioned climate changes, rising sea levels, reduction of biodiversity, and forest protection. To achieve this goal, the aim is to transform the "brown" economy, which is based on a high level of carbon dioxide emissions, into a green economy where these emissions are very low, by setting the goal of reducing carbon dioxide emissions to a level below 2°C at the global level. At the same time, it aspires that at the national level, each country develops a long-term green economy development plan with clearly defined and highlighted priority areas while providing relevant resources - technology, knowledge, finance, and public support (Đorić, 2021). With that goal in mind, certain conventions, programs, initiatives, and agreements were adopted at the international level.

Correspondence:  
Milena Nikolić

e-mail:  
milena.nikolic@singidunum.ac.rs





At the world summit in Rio de Janeiro in 1992, the UN Framework Convention on Climate Change (UNFCCC) was adopted, which set the framework for development of international cooperation in the fight against climate change and global warming (IFF, 2021) (Jemović & Radojičić, 2021). In the same year, the United Nations Environment Program Finance Initiative (UNEP FI) was adopted, thus establishing a partnership between UNEP and the international financial sector (banks, insurance companies, and investors) from 60 countries around the world to include integrated environmental protection and directed investment policy towards ecologically sustainable projects into the business activities and services of financial institutions. (Jemović & Radojičić, 2021). The Paris Agreement on Climate Change from 2015 and the adoption of the SDGs were of the particular importance for managing sustainable development. The Paris Agreement was adopted by 196 countries and set concrete climate goals for the whole world - to limit the global temperature within  $2^{\circ}\text{C}$  of the pre-industrial levels and to reduce it even further to  $1.5^{\circ}\text{C}$ . In order for the goal of reducing global warming to  $1.5^{\circ}\text{C}$  to be achieved, it is necessary to reduce the emission of carbon dioxide by 45% in comparison to the level of 2010 by 2030. This transformation will be possible by achieving 17 sustainable development goals (SDGs), which were adopted by 150 world leaders (IFF, 2021) (Bhutta et al., 2022).

Achieving the adopted SDGs goals and reducing carbon dioxide emissions to the mentioned level requires significant investments. The realization of these goals is not possible without financial resources that would support green projects, green infrastructure, innovative technologies, and equipment that are based on low carbon dioxide emissions, and also without the advisory and professional support of the key players on the green financial market. In this sense, the development of a green financial system and green finance becomes crucial for sustainable development, and the role of international institutions in providing financial resources, funds, and professional and advisory support in the developed and developing countries, such as Serbia, becomes particularly important.

Serbia is a country that mainly relies on fossil fuels, especially for electricity production, whereby more than 80% is produced using coal, imported oil, and gas. It affects pollution of water, air, and soil, thus further negatively affecting agriculture, the health system, and the economy as a whole (GEF, 2017). Consequently, by the end of this century, Serbia could face an annual increase in air temperature of 4%, which is twice the goal set at the global level (Popović et al.). The issue of environmental pollution requires urgent measures in order for the pollution to be reduced, sustainable policies developed, and to provide financial resources and professional and advisory support for the transformation towards a green economy.

At the time when environmental awareness has not yet been fully developed in Serbia and no domestic funds have been set aside to support sustainable development based on the green economy, the funds provided by development financial institutions such as the German Development Bank (KfW), the International Finance Corporation (IFC), are very important. Various creditors such as the European Bank for Reconstruction and Development (EBRD) and funds have an intention to improve energy efficiency in Serbia and stimulate the use of renewable energy sources, such as - Global Environment Facility (GEF), Green for Growth Fund (GGF), Instrument for Pre-Accession (IPA), Western Balkans Sustainable Energy Financing Facility (WeBSEFF), Western Balkans Investment Framework (WBIF) (Behrens, 2021, pp 34-35) (Ostojić, 2022).

The subject of research in this paper is green finance in the Republic of Serbia, which is provided for the financing of more energy-efficient equipment by the European Bank for Reconstruction and Development (EBRD) within the Green Economy Financing Facility (GEFF) program, which was formed by the Green Climate Fund and Government of Luxemburg. The goal of the research is to determine the impact of green finance on the environment and business efficiency of companies that have introduced innovations, and therefore their contribution to the management of sustainable development in the Republic of Serbia.

The rest of the work is divided into the following units. The second part provides a brief overview of the related literature. The data and methodology used in the analysis are presented in the third part. The results and discussion follow in the fourth part, and the conclusion in the fifth.

## 2. LITERATURE REVIEW

Numerous researchers in the country and abroad have tried to define green finance and point out its importance for sustainable development. The different definitions of green finance are often found in literature. According to some definitions, they are identified with climate finance and sustainable finance, while others differentiate concerning these two categories of finance. According to IFF (2021) and UNEP (2016), green finance is a broader term than climate finance, as it is not only intended for projects aimed at reducing carbon dioxide emissions but also for projects that include other aspects of environmental protection, such as those related to energy efficiency, use of renewable energy sources, etc. On the other hand, green finance is a narrower term than sustainable finance, because it does not include social and government aspects of sustainability. According to the definition of the People's Bank of China, green finance represents a series of policies and institutional arrangements that attract private capital



investments in projects related to environmental protection, energy conservation, and clean energy, through financial services that include lending, private equity funds, bonds, shares, and insurance (UNEP, 2016). OECD (2023) defines green finance as finance that achieves economic growth while simultaneously reducing pollution and greenhouse gas emissions, minimizing waste, and improving the efficiency of natural resource use. This highlights the importance of the balance between economic growth and environmental protection, but also their importance for long-term sustainability.

Zeng et al. (2022) indicate that green finance integrates the concept of environmental management into the financial industry, which is significant for sustainable development. One of the significant roles of green finance they point out is that it enables the promotion of technological innovations of organizations while reducing pollution and improving the quality of the environment.

In their research, Rasoulinezhad & Taghizadeh-Hesary (2022) used the STIRPAT model to analyze the relationship between carbon dioxide emissions, energy efficiency, and green energy index and green finance in 10 countries that are at the very top when it comes to supporting green finance. Their research results showed that green bonds are an adequate instrument for promoting green energy projects and reducing carbon dioxide emissions, but only in the long term.

Xiong & Dai (2023) analyzed the impact of green finance on sustainable development in China for the period 1990-2020 and found that it stimulated technological innovation, and the use of renewable energy sources and thus had a positive impact on the sustainable development. They also pointed out that the use of green financial instruments encouraged the development of environmentally friendly technologies.

Zakari (2022) investigated the role of green finance on sustainable economic and environmental development in 26 OECD countries for the period 2000-2018 by regression analysis. The results of this research showed that green finance promoted sustainable economic and ecological development and recommended that green finance be promoted by developing an adequate financial market, green financial system, and rapid development of this financial system in the underdeveloped areas.

### 3. DATA AND METHODOLOGY

The paper used secondary data collected on the success stories of small and medium-sized enterprises and companies from the corporate sector that, with the support of GEFF Serbia Leasing and partner company UniCredit Leasing, acquired more energy-efficient equipment. The analytical method and content analysis method were used for data analysis, while the comparison method was used for the comparative data analysis. The hypothetico-deductive method was applied when setting up and testing the following hypotheses:

- H1: Green finance encourages the application of new technologies and affects the reduction of carbon dioxide emissions.
- H2: The introduction of new technology enables more efficient operations of companies.
- H3: Green finance encourages socially responsible business.

Summarizing the conclusions about the impact of green finance on the sustainable development of Serbia and building the image of socially responsible companies was carried out using the synthetic method.

### 4. RESULTS AND DISCUSSION

An analysis of 6 success stories belonging to the SMEs sector and the corporate sector for which GEFF Serbia Leasing worked on projects and financially supported their investments in new, more energy-efficient equipment was carried out for the following companies: *Zlatiborac Ltd.* from Belgrade, *Arum Deč Ltd.*, Company *Knjaz Miloš JSC* from Arandjelovac, Agricultural cooperative *Graničar* from Šid, *Teko Mining Ltd.* from Belgrade, *Karin Komerc MD* (Table 1).

*Zlatiborac Ltd.* Belgrade is a private family-owned company, which has been operating on the Serbian market since 1992, producing dried and smoked meat specialties according to the family recipe and tradition (which dates back to 1885) (GEFF, 2023), (Zlatiborac, 2023). With its products, this company supplies the leading retail trade chains in Serbia, but also the market of North Macedonia, Bosnia and Herzegovina, Montenegro, Slovenia, Russia, and Belarus (GEFF, 2023). To modernize its business and reduce the harmful impact on the environment, this company received funds worth 271,800 euros and invested them in new cutting and slicing machines. The investment in new equipment contributed to a 30% reduction in operating costs, thanks to a reduction in electricity costs and maintenance costs. Along with the increase in business efficiency, this company also reduced the emission of harmful gases by 30% (1.8 tonnes per year), building the image of a socially responsible company that operates on the principles of sustainable development (GEFF, 2023).



*Arum Deč Ltd.*, an agricultural and recycling family-owned company that was founded in 1992, and today is a leading company in the distribution of vegetable seeds in the country and a major importer of agricultural machinery, organic fertilizers, irrigation systems, and equipment for proper ventilation of crop storage (GEFF, 2023), (Arum Deč, 2023). On the Serbian market, it distributes its products and services to agricultural producers, restaurants, hotels, and retail supermarkets. To collect and recycle waste products from restaurants and the food industry (used paper, oil, plastic, glass, etc.) at the end of the first decade of the 21<sup>st</sup> century, the company *Arum Deč Ltd.* launched a business line that deals with recycling, and in 2020, in cooperation with *GEFF leasing in Serbia* (via UniCredit Leasing), it invested 14,900 euros in a new, more energy-efficient forklift (GEFF, 2023). Thanks to this investment, electricity consumption was reduced by 5.3 MWh per year, and thus the costs of the business line for recycling were also reduced. The use of this forklift also reduced carbon dioxide emissions during the transport and handling of waste and recycled materials by 1.9 tonnes per year (GEFF, 2023).

The company *Knjaz Miloš JSC Arandelovac* with a tradition longer than two centuries is today one of the leading producers of mineral water, non-alcoholic, and energy drinks on the domestic market and in the region (Knjaz Miloš, 2023) (GEFF, 2023). It is known for its com-

mitment to socially responsible business, which is reflected in organized ecological cleaning actions, prize games, and tree planting actions for the collected used packaging for recycling (Knjaz Miloš, 2023). To modernize its equipment, guided by the principles of energy efficiency, the company *Knjaz Miloš JSC Arandelovac* invested 594,000 euros in new, energy-efficient equipment for the production of juices and carbonation. On this basis, it reduced the consumption of electricity by 35% and the emission of carbon dioxide by 56 tonnes per year. This investment enabled the company to amass financial savings of 17,000 euros per year (GEFF, 2023).

Agricultural cooperative *Graničar* from Šid was founded in 1990. It is engaged in crop and fruit production on 2300 ha of land, where it grows corn, soybeans, sugar beet, oil-seed rape, sunflower, seed corn and sunflower, and apples (ZZ Graničar Šid, 2023), (GEFF, 2023). To increase business efficiency and reduce environmental pollution, the cooperative invested 102,000 euros in the purchase of four Bašak tractors, which consume significantly less fuel. The reduced consumption of diesel fuel by 256 MWh per year enabled savings of 20,400 euros per year and reduced carbon dioxide emissions by 62 tonnes per year. Continuous investments in modern and efficient equipment are an integral part of the strategic determinations of the Agricultural Cooperative *Graničar* from Šid,

**Table 1.** Investments in new equipment in Serbia with the support of GEFF Serbia Leasing.

Investor	Location	Investment	Investment size (EUR)	Financial results (savings-EUR/year)	Energy savings (MWh per year)	CO2 savings (tonnes per year)	Impact
<i>Zlatiborac Ltd. Belgrade</i>	Belgrade and Mačkat, Serbia	Machine for slicing	271,800	10,815.00	6.1	1.8	Increased efficiency, lower maintenance costs and reduced CO2 emissions
<i>Arum Deč Ltd.</i>	Deč, Serbia	Forklift	14,900		5.3	1.9	Woman-led business, reduced environmental impact, cost savings
<i>Knjaz Miloš JSC Arandelovac</i>	Arandelovac, Serbia	Juice treatment and carbonation unit	594,000	17,000	75	56	Increased efficiency, reduced energy consumption and CO2 emissions
<i>Agricultural cooperative Graničar</i>	Šid, Serbia	Four tractors	102,000	20,400	256	62	Increased efficiency, reduced environmental impact
<i>TEKO Mining Ltd. Beograd</i>	Belgrade and Batočina, Serbia	Loaders	372,000	30,800	387	94	Increased efficiency, reduced CO2 emissions and reduced fuel consumption
<i>Karin Komerc MD</i>	Veternik, Serbia	Line for separation of gravel and sand	289,700	33,260	100.6	16.8	Increased efficiency, reduced water and energy consumption, climate change mitigation

Source: (GEFF, 2023).





as evidenced by the investments in equipment that were made earlier and the investments that were launched even after the procurement of tractors related to the construction of the cold storage (GEFF, 2023).

*Teko Mining Ltd.* Belgrade is an integral part of *Teko Mining GmbH*, which has been operating in Serbia since 2014. This company owns several quarries where it excavates and produces the various types of stone material used for the construction and development of infrastructure in our country (Teko Mining, 2023) (GEFF, 2023). Intending to improve the efficiency of *Teko Mining Ltd.* Belgrade invested 372,000 euros in two Caterpillar loaders. The result of this investment is a reduced consumption of diesel fuel of 387 MWh per year, which achieves financial savings of 30,800 euros per year and a reduction of carbon dioxide emissions by 94 tonnes per year, i.e., as near as 27% less when compared to the previously used equipment (GEFF, 2023). Reducing carbon dioxide emissions is in line with one of the company's long-term commitments regarding environmental protection - to reduce the consumption of resources used in the performance of activities (Teko Mining, 2023).

*Karin Komerc MD* is a company that was founded in 2005 in Veternik to carry out work in the field of civil engineering, high-rise construction, and hydraulic engineering, but also production and sale of concrete, and exploitation and separation of gravel (Karin Komerc, 2023) (GEFF, 2023). The company previously financed from its funds the replacement of older trucks with new trucks with Euro 6 engines, which reduced the emission of harmful exhaust gases. To further modernize its business, especially the gravel and sand separation process, it invested 289,700 euros in a new Binder+Co machine based on BIVITEC technology, which is lighter and more efficient (GEFF, 2023). The acquisition of this machine enabled an increase in gravel separation capacity by 50% and separation efficiency by 10%. Electricity consumption was reduced by 22.5% per year, water by 34% per year, and carbon dioxide emissions by 16.8 tonnes per year. Reduced fuel consumption and maintenance costs resulted in savings of 33,260 euros per year (GEFF, 2023).

## 5. CONCLUSION

Analysis of successful examples from the practice of the above-mentioned organizations, which financed the renovation of equipment with the support of GEFF Leasing Serbia, confirmed the hypotheses. The observed organizations modernized and improved their operations and influenced the reduction of the costs of using energy and other resources, as well as the reduction of carbon dioxide emissions. By investing the funds from the fund, these companies acquired new, more modern, and

energy-efficient business equipment, which enabled the reduction of carbon dioxide emissions from 1.8 tonnes to 94 tonnes per year. The new equipment made it possible to achieve financial savings from 10,815 euros to 55,000 euros per year, mainly due to savings in electricity and fuel consumption. Green finance and GEFF's professional and advisory support enabled the observed companies to build the image of socially responsible organizations. The results of the empirical analysis clearly show that the businesses of these organizations establish a balance between the economic and ecological dimensions of development and strive for sustainable development in the future.

Despite some progress made by the observed organizations, Serbia is a country that is still in the initial phase of green economy and green finance development. In order to encourage faster transformation and achieve the goals of sustainable development, it is necessary to create a green financial system and influence the awareness of people and organizations about the need for environmental protection and the concept of sustainable development through means of public information and programs in educational institutions.

Although the data on the reduction of carbon dioxide emissions and the achieved financial savings of these organizations unequivocally show that green finance has a positive effect on the management of sustainable development in Serbia, it should be borne in mind that a small number of organizations are included in the analysis. Therefore, it is necessary to expand the existing analysis by including a larger number of organizations in the analysis, as well as the public sector, and analyze the remaining instruments of green finance that were not the subject of analysis in this paper to create a comprehensive picture of the impact of this finance on the management of sustainable development.

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# SUSTAINABILITY ACCOUNTING AND REPORTING: ENHANCING SUSTAINABILITY IN PUBLIC CONSUMER BEHAVIOR

Milica Daković Tadić<sup>1\*</sup>,  
Sanja Baltić<sup>2</sup>,  
Maja Kljajić<sup>3</sup>

<sup>1</sup>Faculty of Business, Liwa College,  
Abu Dhabi, UAE

<sup>2</sup>StarsUp Ltd,  
Podgorica, Montenegro

<sup>3</sup>Singidunum University,  
Belgrade, Serbia

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## Abstract:

In response to global sustainability challenges, such as climate change, social inequality, and environmental degradation, businesses are increasingly required to disclose sustainability-related financial information. This conference article delves into the growing importance of environmental accounting and reporting for companies globally, and consumers' environmental behavior focusing on a case study in Montenegro. This study posits the hypothesis that there exists a positive correlation between the escalating standards and demands for Environmental, Social, and Governance (ESG) reporting by companies and the active engagement of consumers in understanding and fostering a more eco-friendly and sustainable future. The research objective of this paper is to examine by applying interdisciplinary approach whether there is a relationship between the increasing stringency of ESG reporting standards for businesses and the heightened awareness among consumers regarding the significance of sustainability, leading to their active participation in advancing a more environmentally responsible future.

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## Keywords:

sustainability, accounting, reporting.

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## 1. INTRODUCTION

Environmental accounting and reporting have become increasingly prominent in times as both businesses and governments acknowledge the significance of adopting practices and being environmentally responsible (UN, 2020). This conference article seeks to address a research gap by exploring the alignment between robust environmental accounting and reporting frameworks, along with their associated requirements, and users' comprehension of their significance as integral elements of a comprehensive sustainability strategy: case study in Montenegro. The paper posits the hypotheses that there is a positive correlation between the rising standards and requirements for Environmental, Social, and Governance (ESG) reporting by companies and the role of consumers in comprehending and contributing to the creation of a more environmentally friendly and sustainable future. This research seeks to explore consumer awareness of sustainability as an important factor in understanding and using disclosed sustainability-related financial information.

Correspondence:  
Milica Daković Tadić

e-mail:  
milica.tadic@lc.ac.ae



## 2. SUSTAINABILITY ACCOUNTING AND REPORTING: LITERATURE REVIEW

Environmental challenges, including climate change, pollution, and resource depletion, have necessitated a paradigm shift in how businesses and governments approach their environmental responsibilities (UNEP, 2020). Environmental accounting and reporting are instrumental in this shift, enabling organizations to quantify, analyze, and communicate their environmental performance. Concurrently, environmental taxation has emerged as a potent policy instrument designed to internalize environmental costs and drive eco-efficient behavior (IFRS, 2023.)

Sustainability accounting, as discussed by Idowu et al. (2013), is a crucial system that enables organizations to gather and communicate sustainable information transparently, fostering accountability in decision-making processes. The measurement, disclosure, enforcement, standardization, definition of what is normal, and reliability and comparability of the reports are just a few of the problems that sustainability reporting faces. To increase acceptance and compliance with this reporting approach, several issues must be resolved. Scholars now view sustainability reporting as either standalone disclosures or a combination of two types of disclosures, frequently ignoring economic disclosure, as a result of the terminology's constant evolution, including Corporate Social Responsibility (CSR), ESG, environmental reporting, and others (Aifuwa, 2020). For sustainability reporting to be more successful and widely accepted, these problems must be resolved. Additionally, it is challenging to measure issues with accuracy, such as water contamination, changes in ecological structures, and environmental degradation (Jones, 2014). While there exist metrics to measure concerns, such as the biological integrity index and the watershed index, they frequently fail to fully capture the scope of a company's environmental impact (EPA, 2002). Furthermore, when it comes to sustainability reporting, both multinational corporations and domestic firms typically lack mandatory requirements for disclosure. Instead, multinational companies often feel pressure from stakeholders to release sustainability reports, while domestic companies may not face such external pressure, leading to a lack of motivation for disclosure (Aifuwa, 2020). However, contrasting research by Al-Gamrh and Al-Dharnari (2019) suggests that larger companies are driven to disclose sustainability reports as a strategy to gain a larger market share, particularly when compared to smaller companies. Additionally, there is a noticeable trend where newly-listed companies on stock exchanges tend to prioritize sustainability reporting as a means to enhance their competitiveness on the market, as observed by Shamil et al. (2014).

On the other hand, the research (Obarakpo, Olubukola, Ozordi, Osariemen, Gbenedio, Oluwagbemi, 2018), shows that Market Price per Share (MPS) and sustainability reporting have a significant adverse association. This demonstrates how investors on the stock market, who are primarily focused on boosting their returns, frequently exhibit little care for or contempt for sustainability issues.

Investors and financial experts have long expressed skepticism and criticism toward corporate environmental, social, and governance (ESG) data. According to them, it is deficient in qualitative characteristics like relevance, comparability, and credibility and fails to give consumers the information they need to make sound financial decisions (Abhayawansa et al., 2019; Arvidsson, 2014). Fink (2020) asserts that businesses who fail to address sustainability risks in response to stakeholders and refuse to disclose information in a transparent manner would face growing mistrust from the financial markets, potentially leading to higher capital costs. In the best-case scenario, these businesses will gradually transition to a low-carbon economy; in the worst-case scenario, they might struggle to survive. Therefore, research into the implications of corporate reporting and disclosures is a useful contribution accounting scholars can offer to help corporations navigate a world affected by dynamic climate change (Bebbington & Unerman, 2018).

Discussing and analyzing corporate ESG reporting quantity, quality and performance Arvidsson and Dumay (2021) suggest the need for additional study with a focus on consumers, investors, and politicians. Future research may examine the ways that changing consumer preferences are driving improvements in ESG (environmental, social, and governance) performance as well as the ways that changes in capital market allocations are affecting ESG performance.

Understanding the behavior of potential consumers is crucial for effective CSR policy development. Identifying target customer groups and meeting their expectations can give companies a competitive edge. Implementing CSR initiatives valued by consumers can also help establish long-term business relationships (Sawicka, Marcinkowska, 2023).

Climate change, pollution, and resource depletion are just a few of the urgent environmental issues that have forced governments and corporations to reevaluate their approaches to environmental responsibility. In order to quantify, assess, and convey environmental performance and promote eco-efficient behavior, environmental accounting, reporting, and taxes have become crucial instruments. Future studies should concentrate on investors, policymakers, and consumers to better understand how shifting investor priorities and adjustments to capital market allocations affect ESG performance.



This knowledge is essential for creating CSR plans that meet customer expectations and foster enduring commercial ties in an environmental and social environment that is always changing. Accounting scholars have a crucial role to play in providing insights and analysis in a world affected by dynamic climate change.

3. METHODOLOGY

This research utilizes a nationwide survey, administered through both online and phone interviews, to investigate how the public perceives its role in promoting sustainability. The survey covers various aspects, including environmental attitudes, behaviors, and knowledge. It particularly focuses on understanding how customers perceive the importance of ESG factors and the increasing requirements for ESG reporting set by global authorities. Through quantitative data analysis, this study aims to uncover connections and trends in public opinion within Montenegro regarding its research objectives, encompassing understanding, behavior, and willingness to grasp the environmental advantages. The primary objectives of this investigation are to assess public attitudes towards sustainability, evaluate the extent of awareness regarding environmental benefits, and pinpoint the factors that influence pro-environmental conduct. Ultimately, the research seeks to provide insights for public communication strategies aimed at promoting the environmental significance of sustainable resource management.

Data collection for this research study primarily relied on an online survey executed in the first part of 2023, which was conducted using a representative sample of 500 questionnaires, administered through a secure survey platform. To ensure a diverse and representative sample, we employed a combination of random sampling and targeted distribution. Multiple platforms, including social media, online forums, and email invitations, were used to spread the survey link. The survey was filled out willingly by participants throughout a predetermined time period, and their informed permission highlighted the confidentiality and anonymity of their answers. Reminders were

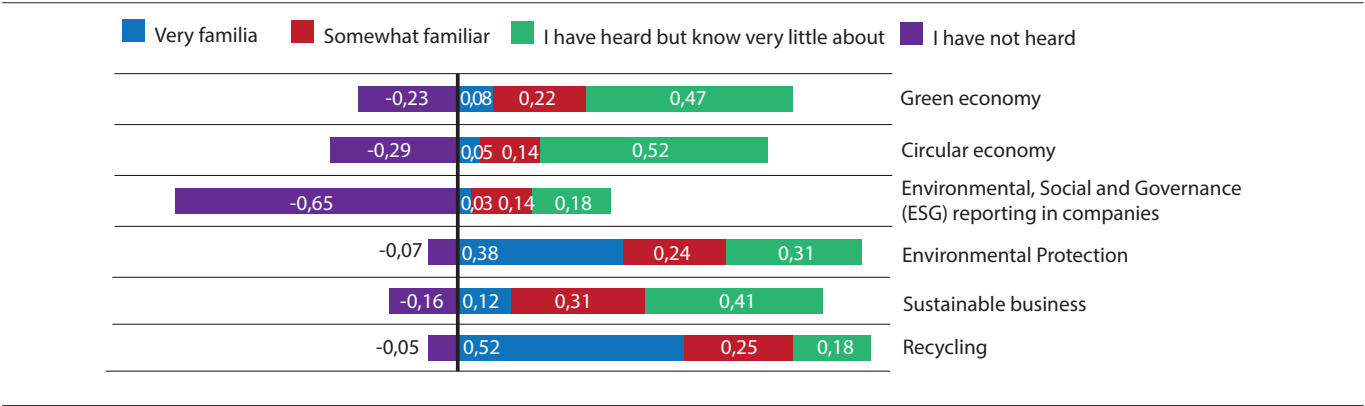
given to encourage participation, and several demographic groups were enlisted to get a diverse variety of opinions from the public. All survey responses were collected and stored securely, with strict adherence to data protection and privacy regulations.

Ethical considerations were at the forefront of our data gathering process. Informed consent was obtained from all survey participants, and their personal information was handled in accordance with data protection laws. The survey was designed: 1) to respect the privacy and rights of respondents, and no personally identifiable information was collected, and 2) to cover two important parts – general information about the respondent (such as gender, age, etc.) and 14 questions related to the topic with proposed answers (see appendix). Rigorous data validation and cleaning procedures were carried out to ensure the quality and accuracy of the collected data. This included identifying and addressing any outliers, incomplete responses, or data anomalies. The gathered data from the online survey were subjected to both quantitative and qualitative analysis. Quantitative analysis involved statistical techniques to identify trends and patterns in public perceptions and behaviors. Qualitative coding was used to analyze open-ended responses for deeper insights. It is important to acknowledge certain limitations associated with online data gathering, including potential response bias, self-reporting bias, and the inability to reach individuals without internet access. Efforts were made to mitigate these limitations, and the findings should be interpreted within these constraints. All data collected during the research were stored securely, and access was restricted to the authorized personnel only. Data protection measures were in place to safeguard the confidentiality and privacy of the respondents.

4. RESULTS AND DISCUSSION

At the start of the survey, participants were questioned about their familiarity with specific phrases linked to recycling and sustainability in order to gauge how familiar individuals are with ESG (Environmental, Social, and Governance) ideas.

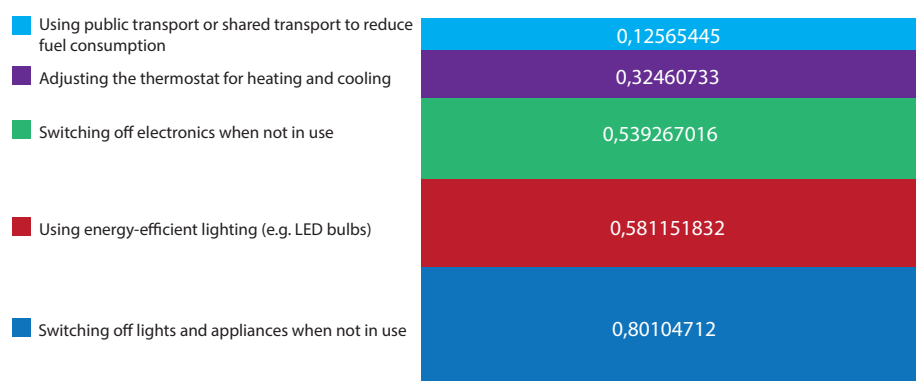
Figure 1. Which of the following terminology and activities are you most familiar with?



Source: Online survey.



**Figure 2.** Do you, and if yes, which of the following energy efficiency improvement practices are you currently implementing?



Source: Online survey.

According to the obtained data, it can be concluded that the public in Montenegro is most familiar with the concept of Environmental Protection (93%), while only 33% of citizens mention that they have heard to some extent about ESG, with 3% being very familiar.

As key measures for achieving energy efficiency, citizens most commonly mention turning off lights and appliances when not in use (80%) and using energy-efficient lighting such as LED bulbs (58%). Every third citizen adjusts thermostats for heating and cooling to increase energy efficiency. Slightly above the average, Generation Z (30%) mentions using public transportation as a measure to increase energy efficiency, while Generation BB stands out for more frequently using energy-efficient lighting (70%).

As the biggest challenge in the process of waste reduction and improving energy efficiency, citizens mention the following: lack of suitable facilities for recycling and composting (73%); lack of knowledge about effective waste reduction methods (47%); resistance to change and ingrained habits (32%); limited availability of energy-efficient products and technologies (29%); high initial costs for energy-efficient upgrades (27%). When it comes to waste reduction practices, Montenegrins prefer to avoid single-use plastics (38%), as well as plastic bags (42%), when shopping at stores. Compared to women (51%), men (34%) fix items more frequently than they do, whereas women (34%) avoid plastic bags at retail outlets. According to data on habits and behaviors, every other Montenegrin recycles to some level, and every third person has not recycled yet but plans to do so in the future. However, 40% of those who recycle say they only occasionally do so.

Among citizens who recycle, 50% belong to Generation X, 31% to Generation Y, and 13.3% to Generation Z. It can also be observed that women (60.2%) more frequently have the habit of recycling compared to men. Additionally, citizens with higher and advanced education (71.4%) and above-average incomes (48%) tend to recycle more. On the other hand, among citizens who mentioned that

they do not recycle and have no intention to do so, those with lower incomes (<€600) make up 44%. As the key reasons for choosing to recycle, citizens mention environmental protection (83%), the preservation of natural resources (42%), and waste reduction (40%). The key obstacles that citizens cite in the recycling process are the lack of suitable recycling facilities (76%), lack of awareness about the existence of recycling facilities (44%), insufficient awareness of the importance of recycling (38%), and a lack of knowledge about how to properly recycle (34%).

When it comes to the community's contribution to increasing recycling habits, it can be concluded that the effort is insufficient, as 67% of citizens state that their community does not provide enough recycling opportunities. Furthermore, 85.3% of them would recycle more if additional recycling services were provided. These services include improved access to facilities (61%), monetary rewards or discounts on products and services (40%), educational programs about the benefits of recycling (26%), and community recognition or rewards programs (18%). Monetary rewards would be a significant incentive for Generation Z (44%) and savers, while improved access to recycling facilities is more prevalent among others. Generation BB, more so than others, considers community recognition or rewards programs as a reason for increasing recycling habits (30%).

Information or resources that would motivate citizens to be more proactive in waste reduction and energy conservation include tips and guides for waste reduction and energy-saving practices (51%), incentives or discounts for adopting environmentally friendly technologies (48%), clear indicators of savings (42%), online tools for tracking and measuring personal waste and energy consumption (24%), and community workshops or events on sustainability (17%).





## 5. CONCLUSION

It is important to acknowledge certain limitations associated with online data gathering, including potential response bias, self-reporting bias, and the inability to reach individuals without internet access. Efforts were made to mitigate these limitations, and the findings should be interpreted within these constraints. The obtained data provides valuable insights into the level of familiarity with ESG concepts among the public in Montenegro and their recycling behavior, which can be linked to corporate ESG reporting, as suggested by Arvidsson and Dumay (2021).

The data show that only 33% of Montenegrin citizens have heard to some extent about ESG, with 3% being very familiar with it. This highlights a potential gap in public awareness of environmental, social, and governance factors in corporate reporting. It suggests that there may be room for improvement in raising awareness and understanding of ESG among the general public. Companies that prioritize ESG reporting may need to consider strategies for increasing awareness and educating their stakeholders about the importance of ESG initiatives. The data also reveals generational and gender differences in recycling behavior. For instance, 50% of recyclers belong to Generation X, 31% to Generation Y, and 13.3% to Generation Z. Women (60.2%) are more likely to engage in recycling compared to men. These demographic variations can be valuable for companies to consider when developing CSR (Corporate Social Responsibility) policies and ESG initiatives. Understanding the recycling habits of different generations and genders can help tailor sustainability efforts to specific target groups. Income plays a role in recycling behavior, with those with higher and advanced education (71.4%) and above-average incomes (48%) tending to recycle more. Conversely, lower-income individuals (<€600) make up 44% of those who do not recycle and have no intention to do so. This income-related variation in recycling behavior underscores the importance of affordability and accessibility of recycling programs. Companies can take this into account when designing CSR programs that are inclusive and accessible to all income groups. The key motivations for recycling cited by citizens include environmental protection (83%), preservation of natural resources (42%), and waste reduction (40%). On the other hand, the main obstacles to recycling include a lack of suitable recycling facilities (76%), lack of awareness about recycling facilities (44%), insufficient awareness of the importance of recycling (38%), and a lack of knowledge about how to properly recycle (34%). These findings emphasize the significance of addressing infrastructure challenges and providing education and awareness campaigns to promote recycling behavior. Companies committed to sustainability can collaborate with local authorities and communities to improve recycling facilities and raise awareness about recycling's benefits.

The data from Montenegro highlight the importance of public awareness, demographic factors, and motivations and obstacles related to recycling behavior. These insights can be valuable for companies looking to enhance their ESG reporting and CSR initiatives. By aligning their sustainability efforts with the preferences and behaviors of different consumer segments, businesses can not only improve their ESG performance but also build stronger and more enduring relationships with their target audiences.

## 6. LITERATURE

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## APPENDIX

Questionnaire for online survey  
Public Perceptions of Sustainability  
Montenegro

### A. Selection of participants

#### A.1. Age?

.....

**STOP THE INTERVIEW IF THE PARTICIPANT IS UNDER 18 YEARS OLD!**

**RECORD AGE UNDER THE AGE CATEGORY**

1. Under 18 years old - STOP
2. 20-34 years old
3. 35-44 years old
4. 45-54 years old
5. 55- 65 years old
6. Over 65 years old - STOP

### Habits and knowledge of recycling

#### A.2. Which of the following terminology and activities are you most familiar with?

Responds	Very familiar	Somewhat familiar	I have heard but know very little about	I have not heard
Green economy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Circular economy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental, Social and Governance (ESG) reporting in companies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental Protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sustainable business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recycling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### A.3. How often do you recycle household waste?

**ONE ANSWER**

1. Daily
7. Weekly
8. Monthly
9. Rarely
10. I do not recycle but intend to
11. I do not recycle and do not intend to

#### A.4. Which of the following items do you recycle?

**MULTIPLE, RANDUMIZE**

1. Paper and cardboard
12. Plastic packaging
13. Glass packaging



14. Aluminum packaging
15. Food waste/compost
16. Electronic waste (e-waste)
17. Batteries
18. OTHER, what [OPEN - ENDED \_\_\_\_\_]

**A.5. What are the main reasons why you recycle or believe recycling should be done?**

**MULTIPLE ANSWERS POSSIBLE, ROTATE**

1. Because of environmental protection
19. Preserving or the preservation of natural resources
20. To reduce waste in landfills
21. To set a good example for others
22. Due to financial or other types of compensation
23. OTHER, what [OPEN - ENDED \_\_\_\_\_]

**A.6. What are the main obstacles you face when it comes to recycling?**

**MULTIPLE ANSWERS POSSIBLE, ROTATE**

1. Lack of suitable recycling facilities
24. Lack of awareness of the existence of recycling facilities
25. Insufficient awareness of the importance of recycling
26. Lack of knowledge about how to recycle properly
27. Laziness or lack of motivation
28. Insufficient incentives for recycling
29. OTHER, what [OPEN - ENDED \_\_\_\_\_]

**A.7. Are you aware that there are recycling facilities available in your community?**

**ALL, ONE ANSWER**

1. Yes, I'm aware of them, and I regularly use them.
30. I'm aware of them, but I haven't used them.
31. No, I'm not familiar with any recycling facilities in my community.

**A.8. Do you believe that your community provides enough recycling opportunities?**

**ONE ANSWER**

1. Yes, there are numerous recycling options
32. No, more recycling options are needed.
33. I don't know/No answer

**A.9. Would you be willing to recycle more if additional recycling services were provided, easily accessible, such as recycling facilities by the roadside?**

**ONE ANSWER**

1. Yes, I would recycle more with additional services
34. No, I wouldn't recycle more even with additional services.
35. I already recycle as much as I can.
36. I don't know/No answer

**A.10. What types of incentives would motivate you to recycle more?****ALL, MULTIPLE ANSWERS POSSIBLE, ROTATE**

1. Cash rewards or discounts on products/services
37. Community recognition or rewards program
38. Educational programs about the benefits of recycling
39. Improved access to recycling facilities
40. OTHER, what [**OPEN - ENDED**\_\_\_\_\_]

**A.11. If yes, which of the following waste reduction practices are you currently implementing?****ALL, MULTIPLE ANSWERS POSSIBLE, ROTATE**

1. Recycling
41. Composting food waste
42. Avoiding single-use plastics
43. Purchasing products with minimal packaging
44. Avoiding plastic bags and packaging when shopping at retail stores
45. Repairing items instead of discarding them
46. None of the above
47. OTHER, what [**OPEN - ENDED**\_\_\_\_\_]

**A.12. If yes, which energy-saving practices do you follow?****ALL, MULTIPLE ANSWERS POSSIBLE**

1. Turning off lights and devices when they are not in use.
48. Adjusting the thermostat for heating and cooling.
49. Using energy-efficient lighting (e.g., LED bulbs).
50. Turning off electronics when they are not in use.
51. Using public transportation or carpooling to reduce fuel consumption.
52. OTHER, what [**OPEN - ENDED**\_\_\_\_\_]

**A.13. What do you consider the biggest challenges in waste reduction and increasing energy efficiency?****MULTIPLE ANSWERS POSSIBLE**

1. Lack of suitable recycling and composting facilities.
53. Limited availability of energy-efficient products and technologies.
54. Lack of knowledge about efficient waste reduction methods.
55. High initial costs for energy-efficient upgrades.
56. Resistance to change and entrenched habits.
57. OTHER, what [**OPEN - ENDED**\_\_\_\_\_]

**A.14. What information or resources would motivate you to be more proactive in waste reduction and energy conservation?****MULTIPLE ANSWERS POSSIBLE**

1. Tips and guides for waste reduction and energy-saving practices.
58. Incentives or discounts for adopting environmentally-friendly technologies.
59. Clear indicators of savings.
60. Workshops or community events on sustainability.
61. Online tools for tracking and measuring personal waste and energy consumption.
62. OTHER, what [**OPEN - ENDED**\_\_\_\_\_]



## **B. Demographics**

### **B.1. Gender of the participant**

1. Male
2. Female
3. Other

### **B.2. What is your highest level of completed education?**

1. Elementary school or less
2. Three-year high school
3. Four-year high school
4. College
5. University
6. Master's/Ph.D.

### **B.3. Which of the following categories best describes your current employment status?**

1. Employer/Self-employed
2. Employed/full-time
3. Employed/part-time
4. Unemployed - looking for work
5. Unemployed - looking for work

### **B.4. What is your approximate monthly personal income?**

1. do 100 euros
2. 101 – 200 euros
3. 201 – 350 euros
4. 351 – 550 euros
5. 551 – 700 euros
6. 701 – 800 euros
7. over 801 euros
8. No personal income
9. No answer/I don't know (do not read)

### **B.5. How many members are there in your household, including yourself?**

WRITE THE NUMBER .....

### **B.6. Which of the following best describes the type of building you live in?**

1. Detached house/individual family house
2. Semi-detached house / two apartments in a building
3. Building with 3-6 apartments
4. Building with 7-12 apartments
5. Building with 13-50 apartments
6. Building with more than 50 apartments
7. No answer

### **B.7. Region**

1. Center
2. South
3. Nord

### **B.8. Type of settlement**

1. City
2. Village





# UNDERPINNING SUSTAINABILITY PARADIGMS: CIRCULAR ECONOMY AND ENHANCED TRIPLE BOTTOM LINE

Aleksandra Minić<sup>1\*</sup>,  
Sanja Filipović<sup>2</sup>

<sup>1</sup>PhD candidate,  
Modern College of Business  
and Science,  
Muscat, Oman

<sup>2</sup>Singidunum University,  
Belgrade, Serbia

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## Abstract:

Whilst stakeholders and policy makers in industry and academia increasingly use circular and sustainable, the terms are not clearly understood. Furthermore, the need for a switch from a current economic model (linear) to the circular one has been recognized globally by the major decision-makers. The shift from one mechanism to another has presented challenges in grasping the Circular Economy (CE) and Sustainability (S) principles: defining them, understanding the similarities and differences, and successfully applying them using Triple Bottom Line (TBL) approach. Employing systematic literature review, the aim of this paper is to clarify the ambiguities and add to clarity by exploring the concepts and the relationship of CE and S by applying TBL framework – social, economic and environmental variables. The gaps regarding relations to people and profit contribution are identified in the literature, future research priorities and new frameworks are recommended.

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## Keywords:

circular economy, sustainability, triple bottom line, people planet profit.

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## 1. INTRODUCTION

In the 20<sup>th</sup> century, through inventions and industrial and technological development, nature and its cycle have been harmed more than ever. Towards the end of this period, however, it feels that humans started waking up – it was not possible to continue this way; mechanisms were needed to reverse the impact made. That is how Sustainability (S) as a concept that means more than business sustainability appeared only in the second half of the 20<sup>th</sup> century (Ruggiero, 2021). Furthermore, Circular Economy (CE) was born, the idea that humans can mimic nature and close loops in the way they produce, use, recycle, repurpose, repair or, when repair is not possible, remanufacture. Its features, according to Geissdoerfer et al. (2017) are comparable to those of S. Finally, when the Triple Bottom Line (TBL) framework emerged (Elkington, 2013a), so did the need to clarify the concepts, define their relationship and successfully apply them on micro, macro and meso levels (Nikolaou et al., 2021a).

This paper sets out to clarify some of the ambiguities and add to clarity by exploring the relationship (whether CE contributes to S) between the two concepts, and how TBL paradigm relates to them through systematising different views in the available literature within the existing frameworks. Considering the topic significance and the amount of literature available, the authors focus mainly on the sources published after the year 2010 to demonstrate latest findings and approaches to this relatively new field first publications of which appeared in 2007.

Correspondence:  
Aleksandra Minić

e-mail:  
alexandra@mcbs.edu.om



Building on previous work, this article further investigates how the ambiguities might affect efficient integration of the concepts into practice and whether a better understanding of the terminology and concepts contributes to bridging the gap in their application. It aims to provide conceptual clarity by analysing the concepts, their relationships and their implementation that would benefit all stakeholders, not only shareholders. Finally, the challenges and potential for further research are identified and the conclusion is made that the social and economic aspects have not been given enough attention and the application of the concepts has not been regulated. Ultimately, a new framework is developed and ideas for further research where people and profit are substantially explored is recommended.

## 2. RESEARCH METHODOLOGY STAGES

For the purpose of this research, over twenty scientific papers and other relevant sources have been cited out of more than fifty publications found which will be used for the upcoming scientific research. The methodology used is a systematic literature review and the steps are shown in Figure 1.

The first few steps consisted of gathering ideas, selecting relevant literature by setting relevant and specific criteria to research scientific databases. The inclusion criteria used in this step were: a) publication type – only peer-reviewed articles were included and relevant renowned books and sources (such as Ellen McArthur Foundation); b) time frame – mostly articles written or published after 2010 were selected as a source; however, some older relevant sources were included (TBL founder's articles, for instance); c) language – only sources found in English were included; d) context - global; e) themes - mainly articles that focus on defining, explaining CE (subtopic one), those that analyse Sustainability Strategies (subtopic two) and finally, the sources that explore TBL and its connection with the previous two concepts (subtopic three) were

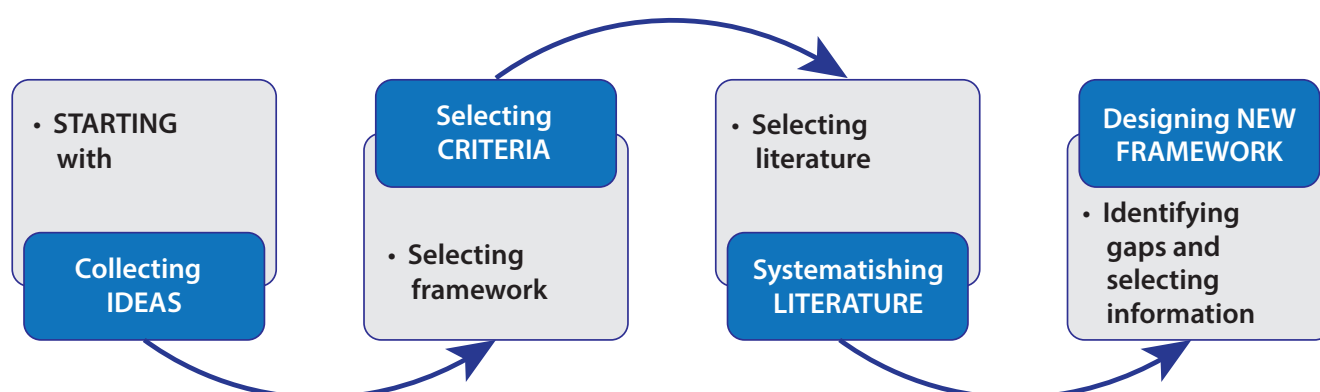
read and cited in this paper. To ensure quality, mostly peer-reviewed scientific papers were chosen, but other sources were also cited - reports, the Ellen McArthur Foundation, Harvard Business Review, etc. The reason for including non-peer-reviewed sources was considered adequate as CE and S are new research areas and the two concepts have not yet been comprehensively explored.

The aforementioned research stages provide a concrete framework used to analyse the relationship between CE and S in both industry and academia globally. Then, the relevant literature was read and examined/systematised in order to identify trends, challenges and gaps. Finally, a new framework was developed.

## 3. VARIOUS SCIENTIFIC APPROACHES TO SUSTAINABILITY, CIRCULAR ECONOMY AND TRIPLE BOTTOM LINE PARADIGMS

The notion that there is a need for S, CE and TBL to be thoroughly explored has of late resonated with industry stakeholders on different levels (national and global) as well as academics – from less than 100 articles researched and published on the topic ten years ago, 2022 saw more than 4000 articles published (Figge et al., 2023) defining, or trying to define, CE and its application. First article was published in 2007, over two-thirds of papers on CE were published 2015-2017 (Reike et al., 2018). Stahel, MacArthur, and Elkington are among the pioneers while Figge and Svenson Thrope stand out when it comes to recent CE articles. The *Journal of Industrial Ecology* was the first one to rebrand and incorporate CE, while the *Journal of Cleaner Production* is the one that publishes most scientific papers that deal with CE and S (Kirchherr et al., 2023). This section has been divided into subsections to classify relevant information that explain CE, analyse S, identify the TBL relevance (and challenges) and lastly, it contains the relevant findings.

Figure 1. The stages of methodology.



Source: Author's.



### 3.1. Circular Economy

According to Figge et al. (2023), more than 100 CE definitions are available, nevertheless, the two major ones have been shared here. Kirchherr et al. (2017) reviewed the existing definitions and proposed their own according to which CE refers to a framework that consists of business models which no longer deal with end-of-life principles; instead, this concept aims to minimise waste through reduction, reuse, recycling and material recovery through the mechanisms of consumption, distribution and production. This approach, according to the authors, works through various levels including companies, products and consumers at the micro level, eco-industrial parks at the meso level and cities, regions, nations at the macro level. The ultimate goal is to achieve sustainable development which encompasses fostering social equity, ensuring economic prosperity and promoting environmental well-being to bring meaningful outcomes for current and generations to come.

Figge et al. (2023) argue that former definition is insufficient, confusing, broad but also too narrow. They offer their own definition stipulating that the CE is a multi-tiered mechanism that uses resources so that all loops are ultimately closed. Reusing, recycling, and other methods help with resource optimisation and flow, adding to effective circularity. Ideally, all resource loops will be closed and there will be no waste and no need for more resources. However, sourcing virgin materials seems unavoidable.

First half of 20<sup>th</sup> century saw the conception of CE in a form of recycling in Germany, closed loop (waste management) in Switzerland, products life cycle in Belgium (Reike et al., 2018). However, it was not until 1970s that circularity started being seen as necessary, and Stahel considered its founding father (Ekins et al., 2020). Finally, Stahel (2016) writes it is high time CE was introduced through vocational and academic training – all must be aware of it and start ap-

plying it. One of the attempts to regulate CE activities was done by MacArthur (MacArthur, 2013) who made a shift to the circular economy in industry and academia. Starting with the Ellen MacArthur Foundation, CE has therefore been perceived as a tool, a business model for Sustainable Development (*How to Build a Circular Economy* | Ellen MacArthur Foundation, n.d.-b).

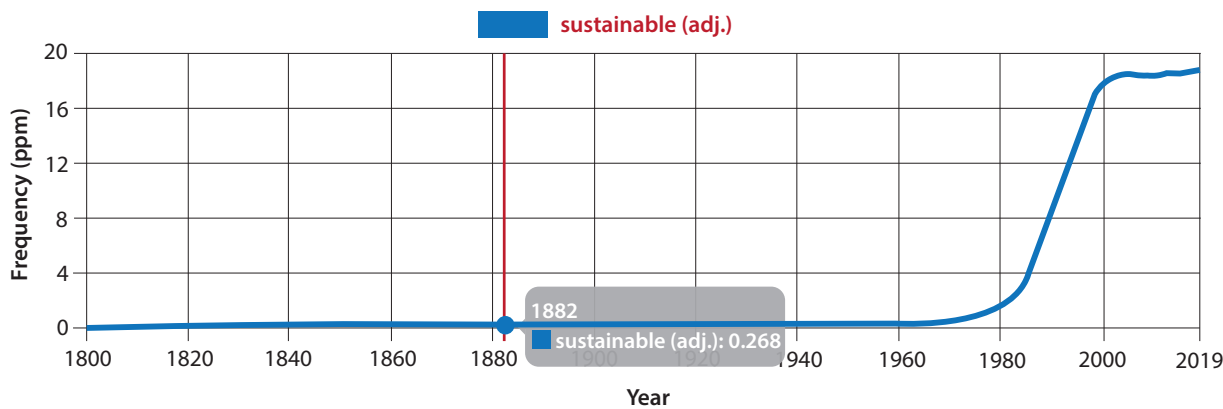
### 3.2. Sustainability

It is relevant to note that the usage of the word *sustainable* rises exponentially after the year 1980, as seen in the Figure 2.

A possible explanation of this trend can be that the term sustainable development was for the first time used in the UN World Commission on Environment and Development (WCED) report published in 1987 by Leal Filho et al. (2015) when the so-called Brundtland Report (another title given after the then Prime Minister of Norway who chaired WCED) defined the phrase as development that fulfils present requirements while preserving the capability of coming generations to meet their requirements (Reike et al., 2018).

Social, economic, and environmental issues were finally recognised, while their interrelation and the importance of finding an equilibrium between economic expansion, social well-being, and environmental protection emphasised. Initially, the term sustainable was mostly used in connection with economic development; however, after the Eco-Rio, a UN Conference on Environment and Development held in Brazil in 1992 (United Nations, n.d.), the meaning of the phrase became more holistic referring to the enhancement of the social and economic variables like poverty relief, unemployment, inequality, health, better food, housing and education (United Nations, n.d.-b). Both S and CE concepts attempt to include non-economic components into development (Geissdoerfer et al., 2017).

Figure 2. The use of the word sustainable.



Source: Taken from Online Etymology Dictionary.



### 3.3. Triple Bottom Line

TBL was founded in 1994 by John Elkington, a British entrepreneur and author, one of the leading figures in social responsibility and sustainability. People, Planet and Profit are balanced and essential elements representing sustainability (Admin & Admin, 2023). The framework below shows that the financial bottom line that businesses are concerned with is too limited, and this framework offers a holistic approach leading to sustainable development (Elkington, 2013a).

Elkington (2013) felt the framework has been criticized mostly for not contributing to the people and planet aspects. Eventually, the founder decided to 'recall' the concept in the article he published in Harvard Business Review (2018).

Although the CE concept appears to be the oldest of the three, it only developed in the current form in the last decade. It is the most limited in nature as it does not deal with the social aspect but mostly with disposing of pollution and waste efficiently, materials and products circulation, and nature regeneration according to MacArthur (2010). However, it has been gaining momentum – the academia has recognised its importance and many research papers have been published recently. Sustainable development deals with a wider scope and especially after the formation of Sustainable Development Goals in 2012, CE has been seen as a mechanism to promote sustainability goals (Nikolaou et al., 2021a). The TBL appeared, says its founder Elkington, as a response to the need to clarify S and bring it closer to business decision-makers.

### 3.4. Findings

This paper analyses the three frameworks in the way they are understood and presented in literature, their timeline and the way they are applied. Arruda et al. (2021) believe that it is difficult to predict how the CE evolution will develop due to lack of clarity in interpreting the term. However, they speak about different periods in CE development and have noticed the pattern in publications and different aspects of CE from 2015 to 2020 (Table 1 below).

Reike et al. (2018) gave account of the CE publications from 2004 to 2015 (Figure 4). It can be seen that the majority of literature has been written on recycling and waste management, followed by waste recycling, while a large number of other concepts have not appeared in scientific papers until the 1990s. Notably, CE emerges only around or after the year 2000 which calls for the conclusion that this might be the time when the CE foundations are laid.

Upon these foundations, the CE structure was built. This was reflected in Nombro et al. (2021), in their attempt to define CE and its development, as well as present the publication history. They showed the rise in publications on CE (Figure 5.) where it can be observed that CE has clearly been increasingly recognised and written about. In 2020, for instance, a comprehensive literature review was written to analyse and classify various CE models (Geissdoerfer et al., 2020).

Figure 3. TBL framework and the interconnection of elements.



Source: Open source license: CC BY 4.0.



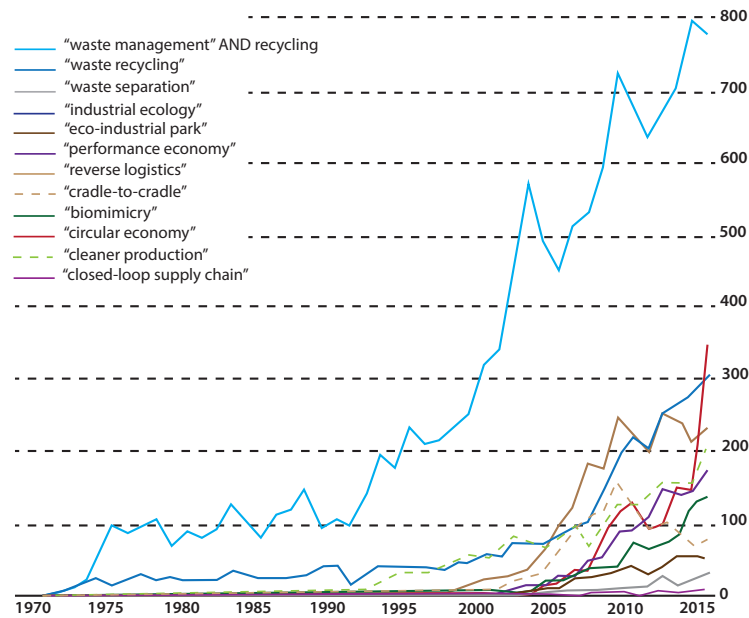
**Table 1.** Time frames and different periods of CE.

Year(s)	Period name
1960-1985	Preamble period
1985-2013	Excitation period
2013-Present*	Validity challenge period

\*The periods researched ended with 2020

Source: Aruda et al., (2021).

**Figure 4.** SCOPUS publication on CE and related themes.

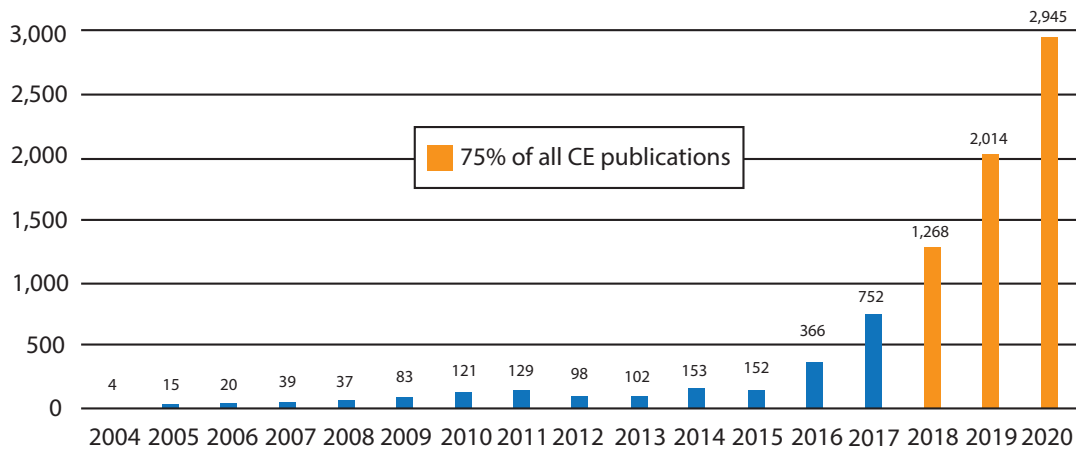


Source: Reike et al., (2018).

The Rio conference played a pivotal role in redefining the concept of S and incorporating it into the global policy-making system and documentation. Only after this conference, and (re)defining of the term sustainable, did the other aspects and frameworks come into being –

socio-economic and environmental. Thus, the term CE has been coined (Ekins et al., 2020). Finally, TBL framework, founded by Elkington in 1994, influenced CEOs and CFOs to move from profit making to ‘people making’ and ‘environment making’.

**Figure 5.** The CE publications, expansion over the years.



Source: Nombre et al. (2021).





Throughout the literature, there is consistent evidence that there are currently not enough policies (or in most countries, no policies at all) to regulate Corporate Social Responsibility (CSR) through CE, TBL and sustainability practices and reporting (Shnayder et al., 2015). Indeed, in some countries the policies are there, Germany did integrate CE into legislation in 1996 (“Closed Substance Cycle and Waste Management Act”), China in 2002 (with the aim to regulate energy efficiency) and Japan in 2002 (The Basic Law for Establishing a Recycling-Based Society) (Su et al., 2013). Although websites increasingly advise on clothes or electronics repair and some companies (e.g. Philips) offer repair for advanced technology equipment, it appears that most organisations, and countries, choose sustainable and CSR activities haphazardly and report on them in a way which benefits their image rather than society.

Shnayder et al. (2015) demonstrate how CSR and S efforts of an organization can be misinforming. The foundation of the issue is measuring - there has been a challenge in finding the right way to measure the impact of applied sustainability mechanism such as TBL accurately, meaningfully, and consistently. Thus, reporting on the impact and benefits might have to be taken sceptically. Realising these challenges, the founder of TBL framework, Elkington decided to recall the concept (Elkington, 2018). In June 2018, he expressed in Harvard Business Review that the concept had not been utilised as its core value suggested and as the author intended; he felt that stakeholders still calculated mostly profit (finances) using the TBL paradigm. The TBL was meant to inspire reflection on capitalism and its prospects, but the accountants and reporting consultants diluted the concept which was

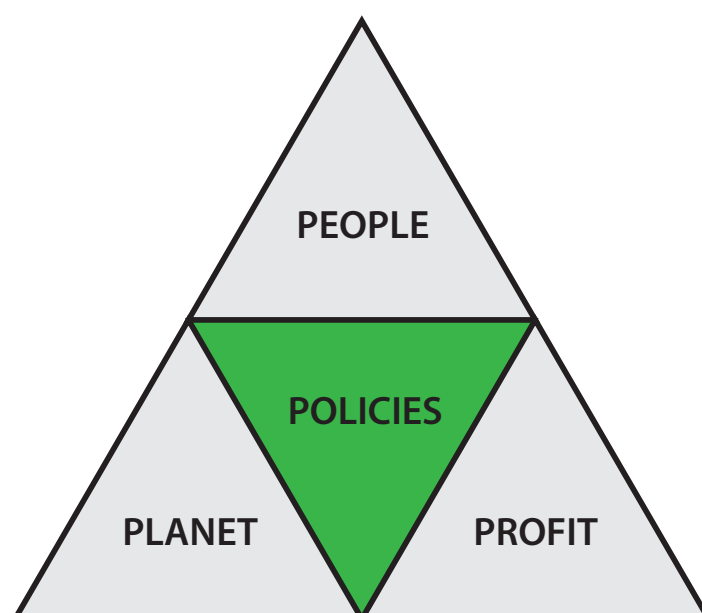
meant to add a genuine value to decision-makers in their managing of activities and by doing so, contribute to the improvement of human conditions. In short, while everyone was still focused on profit margins, people and planet ‘margins’ were not made priority.

Consequently, the conclusion was made by the authors that the TBL needs to be enhanced in order to be applied systematically across sectors. This study disagrees with recalling the TBL concept; instead, a paradigm shift is needed. To that end, an additional element has been proposed, the fourth P that stands for policy - a prerequisite for other Ps (Figure 6). This new P will ensure that legislation is in place to regulate fair, meaningful, and sustainable benefits for all. Crucially, the Four Ps Pyramid proposes firm policy implementation – detailed and strictly regulated legislative system that oversees the execution and measurement of SDGs, including clear incentives and penalties. The new framework must be distinguished from Quadruple Bottom Line (QBL) which comprises People, Planet, Profit and Purpose (Tiller et al., 2022) as the P in our framework is not bottom-line; indeed, it is a basis for Elkington’s paradigm to be successful.

#### 4. CONCLUSION

Based on the above analyses of the CE, S and TBL concepts and frameworks, a conclusion has been drawn that the concepts are often not fully understood and the resemblances and contrasts between them unclear. Occasionally, reporting on implementation has been found misleading. Having read several papers, this research paper hopes to have clarified these ambiguities and will be

Figure 6. Four Ps Pyramid.



Source: Author's.



able to offer insights that bring benefits to the policy makers, industry and academia stakeholders.

Hitherto, there have not been clear and definite policies on a macro level that would offer adequate direction. Fundamental tenets to be taken into consideration include: engaging all stakeholders such as clients, employees, local communities and society at large; financial sustainability; diversity and inclusion; cost-efficiency; involvement in society; innovation and growth; ROI; employee well-being; long-term profitability; ethical practices. Therefore, a new framework was developed and introduced in this study adding another, fundamental P to the existing TBL – the one that stands for Policies. This approach is based on the premise that economic development and prosperity are not a goal; economic viability should serve humanity. Consequently, a regenerative economy reaching sustainable development goals, promoting healthy living conditions, is built.

Although an important step has been taken through this study, future research recommendation is related to the missing concept uncovered – the lack of focus on social and economic aspects and their relationship, i.e. people and profit within People, Planet, Profit (PPP) framework is observed. Identified policy gaps and proposed changes will ideally promote sustainable business practices, incentivise circular economy initiatives, and create an enabling environment for people-centred and profitable circular models. Prioritising balance of social equity and economic sustainability is a holistic approach which can lead to more sustainable, profitable, ethical and thus, successful businesses in the long run.

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# THE IMPORTANCE OF HRM PRACTICES FOR FOSTERING CREATIVITY DEVELOPMENT IN IT ORGANIZATIONS

Jadranka Kosović<sup>1\*</sup>,  
Lazar Dražeta<sup>2</sup>

<sup>1</sup>PhD candidate,  
Singidunum University,  
Belgrade, Serbia

<sup>2</sup>Singidunum University,  
Belgrade, Serbia

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## Abstract:

Over the past twenty years, there has been a significant increase in the focus on creativity, driven by major changes in the business environment, such as heightened global market competition. This has consequently contributed to ever-increasing job complexity and workforce mobility. Information technology (IT) represents the fastest-growing sector, relying on the creativity and innovation of employees. Organizations are increasingly turning to the Human Resource Management (HRM) function in search of answers on how to foster both individual and organizational creativity. It is therefore crucial not only to identify creative employees but also to establish conditions that foster organizational creativity, with the HRM function playing a pivotal role.

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## Keywords:

individual and organizational creativity, HRM practices, IT organizations.

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## 1. INTRODUCTION

Knowledge and creativity have always played an important role in the economy. What is important nowadays is the way creativity and economy are combined to create added value. In the world of rapid technological and social changes, creativity goes beyond culture and art; it becomes a skill. This skill is essential to express ourselves, respond to changes, face the unknown, solve problems, and contribute to societal development (Csikszentmihalyi, 1996; Amabile, 1998; Robinson, 2001; Florida, 2002; Sawyer, 2012).

According to Howkins (2001), there are two types of creativity: one related to self-actualization of an individual and the other to a product. The first is a universal characteristic of humanity and is present in all societies and cultures. The second is more prevalent in industrial societies, which place greater value on novelty, scientific and technological innovations, and subsequently intellectual property rights.

With the changes brought about by the new Industrial Revolution 4.0, characterized by the integration of advanced technologies such as the Internet of Things (IoT), artificial intelligence (AI), and robotics into production processes (Schwab, 2016), the IT sector has become an integral part of the economy and society. Business success is increasingly driven by the organizational ability to respond, meeting needs and challenges and seeking human capital with knowledge, creative skills, and intrinsic motivation. In today's highly competitive environment, this quest represents one of the biggest challenges for organizations (Hamel, 2007).

Correspondence:  
Jadranka Kosović

e-mail:  
kosovicj@gmail.com



To cope with the challenges posed by the new business environment, organizations pay special attention to the HRM function that manages the process of staffing, developing, evaluating, and retaining human capital, which should achieve the organization's goals and contribute to its competitive advantage (Armstrong, 2009). Hence, the role and significance of HRM in today's business environment, particularly in fostering creativity at both individual and organizational levels cannot be underestimated (Amabile, 1996).

## 2. ORGANIZATIONAL CREATIVITY

Organizational creativity is undeniably one of the most critical factors in cultivating innovation within a business environment. This significance is rooted in the fundamental criterion that defines creative ideas—they must possess the attributes of novelty, originality, and practicality (Barron and Harrington, 1981). It is worth emphasizing that these qualities require validation from the external world because an idea that might appear novel and useful to an individual, not necessarily resonate with the broader context.

Consequently, the organizations in which creative professionals are empowered and supported play a pivotal role in nurturing creativity. Beyond the validation of creative concepts, these organizations can actively foster both individual and group creativity. This can be accomplished by establishing a secure environment conducive to experimentation, grant employees the autonomy to act, provide unwavering support from supervisors and work groups, and cultivate a culture centred on shared vision, collaborative interactions, constructive feedback, and equitable evaluation and recognition. Additionally, organizations serve as reservoirs of valuable data, information, knowledge, and wisdom. Through these efforts, organizations can effectively tap into intrinsic motivation. Research by Amabile (1998) suggests that motivation for creativity can be stimulated through six categories of management practices: challenge, freedom, resources, characteristics of work groups, supervisor support, and organizational support.

Furthermore, organizations assume a crucial role in ensuring the availability of sufficient resources and applying the appropriate pressure when necessary. Regarding resource limitations, it's not solely about the factual availability but also the perceived adequacy of resources. A similar situation arises with pressure: when it stems from a sense of urgency or intellectual curiosity, as suggested by Amabile (1988), it can be perceived as having a positive impact on creativity.

## 3. HRM PRACTICES FOR FOSTERING CREATIVITY

Indicators of organizational creativity represent the quality and quantity of new ideas, the degree of innovativeness, the development of systems supporting creativity, collaborative and communicative practices, as well as leadership support (Woodman et al., 1993). By implementing contemporary HRM practices, it is possible to influence the development of individual and organizational creativity (Amabile, 1996; Hamel, 2007).

HRM practices refer to organizational activities managing the pool of human resources and ensuring that these resources are employed towards the fulfilment of organizational goals. One of the lingering questions in HRM research is whether there is a single set of policies or practices that represents a “universally superior approach to managing people” (Chandler and McEvoy, 2000).

The internal environment of organizations strongly affects their HRM practices. The key internal factors are top management, business strategy, organizational culture, organizational structure and size, knowledge management, and HR policies. However, one of the most important factors is the top management. If top managers are transformational leaders and they demonstrate inspirational motivation, intellectual stimulation of others, individual consideration, and idealized influence, they can surely improve the creativity of employees in the organization (Zhang & Bartol, 2010).

Business leaders are responsible for creating a business strategy that prioritizes innovation to keep the organization competitive in the market. If they involve HRM in strategy development, then HRM practices should align with organizational goals and priorities (Gumusluoglu & Ilsev, 2009). They can facilitate desired organizational culture and thus influence the level of creativity in the organization by supporting experimentation, cooperation, risk-taking (Amabile, 1988; 1996), while promoting innovative thinking and diversity to develop abilities to overlook situations and solutions from different perspectives (De Jong & Den Hartog, 2007).

By building a creative organizational culture, HRM practices have an impact on creative skills development and provide a secure environment for fostering creativity of employees (Florida, 2002; Amabile & Kramer, 2011). Organizational design is one of practices that, through building an organizational structure, can promote cooperation between different teams and decrease bureaucratic barriers that have negative impact on creativity (Perry-Smith & Mannucci, 2017). Organizations that support teamwork and cooperation between employees can improve their ability to generate and develop creative ideas (Amabile, 1998; Sawyer, 2007).





According to McPherson (2008), there are many small organizations that do not institute formal HRM practices, whereas in large organizations, sometimes for each function, there is a need for a different HR departments (Jackson et al., 1989). Formal HRM practices essentially help to maintain consistency in all HRM functions. For instance, HRM practices that focus on knowledge management facilitate ideas and knowledge exchange among employees (Bock & Kim, 2002), and organize online forums and brainstorming workshops for new idea generations (De Jong & Den Hartog, 2007).

#### 4. CASE STUDY: ROLE OF HRM IN FOSTERING CREATIVITY DEVELOPMENT IN IT ORGANIZATIONS

Subject of this research is an IT organization of middle size, which employs 51 to 100 employees. The company declares itself as high-technological with domestic and foreign capital. The majority of its operations are present in Serbian market; at the same time, it has a significant presence on the global market. Due to a rapid digitalization of economy and society, the company is getting more requirements to provide creative solutions in order to support integration of existing into new systems that require digitalisation of business operations and to provide the adequate employees with knowledge about current and new operating systems. The pressure on team in Serbia is coming from global market initiatives, where rapid technological upturn led by AI engage all available resources to keep the pace with ever-changing market expectations.

HRM function is actively involved in all the activities related to organizational culture and people processes. One of the main challenges is to detect and attract the appropriate number and quality of employees, due to high competitiveness at the Serbian labour market. Besides company owners, HRM function is one of strategic business partners, while under the constant pressure from stakeholders represented by business leaders, employees, labour market and business clients.

In order to overcome these challenges and understand and identify key areas of future focus, organization decides to carry out research related to the role of HRM in fostering creativity development. Anonymity of organization was a prerequisite to publish this research due to the highly competitive nature of business market.

#### 4.1. METHODOLOGY

For the purpose of this qualitative research, an online questionnaire was used as the instrument for data collection. Thirteen out of fifteen invited employees from both the Research and Development and HRM departments have participated. Participants were randomly selected for this research.

The questionnaire consists of 34 questions, including 27 open-ended and seven closed questions. The closed questions require answers on a five-level Likert scale, where “1” represents the lowest rating and “5” the highest. This scale allowed for the differentiation of opinions. The questionnaire is divided into two parts. The first part focuses on collecting basic information about the participants that was used to understand their individual perspectives. This information was related with the responses from the second part of the questionnaire to identify any mutual relationship and/or trends. Hence, the aim of this research is to comprehend the importance of creativity in the IT organization, and the role of HRM practices in fostering creativity from the employees' perspective.

#### 4.2. RESEARCH RESULTS AND DISCUSSION

To comprehend the role of the HRM function in fostering the development of creativity, we examine the research findings in conjunction with pertinent HRM practices and delve into their contributions. Subtitles stated below (i.e. “main categories”) are based on the most prevalent comments from participants, including proposed HRM practices (i.e. “subcategories”), which are presented in Table 1.

When expressing views on the significance of creativity within the organization, participants underscored their full awareness of creativity as a direct contributor to the organization's competitive advantage. They claimed that creativity serves as a catalyst for initiating change as a prerequisite for innovation and empowers the company to respond effectively to market needs.

Consequently, the role of HRM in fostering creativity was deemed pivotal. HRM activities can attract and recruit creative employees, establish an environment conducive to creativity development at both the individual and group levels, and influence employee retention that reinforces the competitive advantage. Indeed, it was claimed that creativity indicators within the organization encompass various aspects: the quality and quantity of new ideas, the degree of innovativeness, the development of systems supporting creativity, collaborative and communicative practices, and leadership support (Woodman, et al., 1993).



#### 4.2.1. Strategic Orientation

Participants acknowledged the necessity for HRM to adopt a strategic orientation, so as to align itself with contemporary trends and competitive dynamics, as indicated by Gumusluoglu and Ilsev (2009). HRM is thus expected to shape the organizational culture and impact the climate for creativity development (Florida, 2002; Amabile and Kramer, 2011), through an approach that encompasses both individual and organizational facets. This approach aligns with the component model for individual creativity (Amabile, 1997), and organizational creativity development (Amabile, Burnside, and Gyskiewicz, 1995).

#### 4.2.2. Fostering Individual and Group Creativity

The significance of expertise, knowledge, and motivation was emphasized by participants, as some of these elements constitute two out of three major components of individual creativity (Amabile, 1997). They even anticipate HRM to recruit candidates who are not only knowledgeable but are motivated.

Although not explicitly stated, the acquisition of knowledge, expertise, and motivation can result from hiring candidates with diverse knowledge and skills. This was implied by participants' statements regarding knowledge sharing within multifunctional project teams. Thus, HRM's role extends to involving supervisors and subject matter experts in defining a) level of competencies required for recruitment, b) revisiting these requirements periodically based on business needs, and c) conducting regular reviews (SHRM, 2013). By recruiting candidates with diverse knowledge and skills, HRM not only fosters an environment for creativity development but encourages flexibility, openness, adaptability, originality, and the generation of a greater number of novel solutions that contribute to the success of teams and organizations in meeting market demands (The New York Times, 2014). Expectations concerning knowledge and motivation also extend to team members, as participants anticipate them to be adequately prepared and informed before meetings, enabling their active and meaningful participation.

#### 4.2.3. Facilitating Supervisor Support for Knowledge Sharing within the Organization

According to the participants, the expectation of knowledge extends not only to colleagues but also to mentors and supervisors to facilitate participation in discussions regarding emerging knowledge and trends. This underscores the significance of supervisor support in creating an environment conducive to organizational creativity (Amabile, Burnside, and Gyskiewicz, 1995). HRM role in supporting workgroups includes establishing conditions for collaboration and knowledge exchange (Bock & Kim, 2002).

#### 4.2.4. Facilitating Supervisor Support for Knowledge Sharing Outside the Organization

Participants highlighted the importance of knowledge sharing that extends beyond their organization, which encompasses learning and support groups outside the organization. This reflects an awareness of the significance of safeguarding proprietary information while assuming responsibility for sharing pertinent knowledge beyond the organizational boundaries. HRM role in facilitating knowledge sharing beyond the organization entails shaping an organizational culture that champions creativity. This can be achieved by fostering formal knowledge and experience sharing through participation in conferences, forums (De Jong & Den Hartog, 2007), seminars, lectures, workshops (Amabile & Khaire, 2008), and transparent communication with employees regarding the delineation of business secrets and the protocols for sharing information externally. These efforts should be reinforced through training, ethical workshops (Chang, Gong, & Shum, 2011), and administrative measures in the form of procedures designed to raise employee awareness and facilitate knowledge dissemination.

#### 4.2.5. The Significance of Training and Development

Participants also highlighted the importance of creative skills such as problem-solving, adaptability, change management, critical thinking, flexibility, agility, resourcefulness, non-standard thinking, leadership and communication skills, and emotional intelligence. In addition to recruiting candidates with these skills, HRM is expected to create an environment conducive to its development. This should align with participants' expectations, as HRM should organize training and workshops aimed at nurturing these skills (Amabile & Khaire, 2008; Gumusluoglu & Ilsev, 2009) and allocate time for employees to acquire and apply the required skills.

Participants emphasized the need for dedicated time for ideation and the presence of knowledgeable and motivated conversation partners who are open to communication and willing to constructively challenge the proposed solutions. HRM is expected to foster the atmosphere of trust by promoting collaboration and teamwork, improving communication skills, offering coaching, mentoring, and counselling.

#### 4.2.6. Setting Clear Expectations and System of Compensation and Rewards

Participants highlighted the importance of clear expectations and the establishment of a system of salaries, rewards, and recognition to incentivize creativity and innovation. HRM's role in articulating clear expectations



encompasses the establishment, organization, facilitation, evaluation, and monitoring of goal setting at both organizational and individual levels. This can be accomplished by implementing a prudent performance management system (Armstrong, 2009). Performance appraisals serve as a mechanism for acknowledging and rewarding creative contributions, thus motivating employees to engage in more creative endeavours (Oldham & Cummings, 1996). To evaluate the performance of creative work effectively, it is essential to possess an understanding of how to measure creativity at the individual level, product creativity, the creative process, and creative solutions (Rhodes, 1961). Consequently, HRM's role encompasses acquiring an understanding of these measurement techniques and applying the appropriate methodologies.

The establishment of a compensation and reward system to encourage creativity and innovation involves linking awards to the successful implementation of creative ideas (Amabile, 1996). Participants emphatically highlighted the significance of financial and non-financial incentives for stimulating creative work, as they serve to enhance motivation and commitment to creative endeavours. The participants explicitly acknowledged HRM's role in establishing compensation and reward systems.

#### 4.2.7. The Significance of Stimulating Creativity and Overcoming Barriers

HRM's role in stimulating creativity and eliminating barriers to creativity entails the recognition of stimuli, as well as promotion, monitoring, and the implementation of necessary corrections through regular two-way communication of all employees. This underlines the use of communication techniques and methodologies, such as team meetings to facilitate the exchange of new ideas among employees (VanGundi, 1992), group support systems that provide anonymity for participants (Dennis and Valacich, 1993), especially when handling larger groups (Gallupe et al, 1992) and utilizing creative problem-solving techniques (Ozborn 1953). In addition, participants explicitly acknowledged the pivotal role of HRM in terms of barrier removal, which Davis (1999) categorizes as learning and habits, rules and traditions, perceptual, cultural, and emotional barriers.

**Table 1.** Categories of HRM practices for fostering creativity in IT organization.

Main categories	Sub-categories
1. Strategic Orientation	<ul style="list-style-type: none"><li>• Understand business specifics and needs</li><li>• Build and promote creative organizational culture</li><li>• Monitor the labour market</li><li>• Align HR processes with contemporary trends and competitive dynamics</li></ul>
2. Fostering Individual and Group Creativity	<ul style="list-style-type: none"><li>• Hire for diverse knowledge, creative skills, and intrinsic motivation</li><li>• Design jobs together with subject matter experts</li><li>• Conduct regular job description reviews</li><li>• Organize individual and group workshops</li></ul>
3. Facilitating Supervisor Support for Knowledge Sharing within the Organization	<ul style="list-style-type: none"><li>• Introduce coaching and mentoring</li><li>• Introduce knowledge sharing</li></ul>
4. Facilitating Supervisor Support for Knowledge Sharing Outside the Organization	<ul style="list-style-type: none"><li>• Foster formal knowledge and experience sharing through participation in conferences, forums, seminars, lectures, and workshops outside the organization</li></ul>
5. The significance of Training and Development	<ul style="list-style-type: none"><li>• Organize training for fostering creative skills</li><li>• Allocate time for acquiring and applying required skills</li><li>• Organize leadership training</li><li>• Introduce Career development</li></ul>
6. Setting Clear Expectations and System of Compensation and Rewards	<ul style="list-style-type: none"><li>• Introduce Performance Appraisal System</li><li>• Organize goal settings and applying appropriate methodologies workshops</li><li>• Introduce Compensation and Benefits System</li></ul>
7. The Significance of Stimulating Creativity and Overcoming Barriers	<ul style="list-style-type: none"><li>• Introduce individual and group approach for overcoming barriers by monitoring, identifying, and organizing supporting activities</li><li>• Stimulating creativity through promotion, monitoring, and implementation of activities on individual and group level</li></ul>





## 5. CONCLUSION

The study has shown that HRM plays a pivotal role in fostering creativity in an IT organization. This role is complex because it involves supplying the organization with the most important asset, human capital (Boljanović et al, 2023) that proves necessary for survival in the highly competitive IT sector, the fastest-growing industry worldwide. In addition to human resources supply, the role of HRM is reflected in creating conditions for work, development, and self-actualization of employees, which consequently provide results that create a competitive advantage. Due to the war for talent that is particularly pronounced in the mentioned sector, retaining high-quality individuals becomes a challenge that organizations address by seeking solutions from HRM.

Theoretical research (Amabile & Khaire, 2008; Noumair & Kite, 2010; Piorkowska, & Zolnierczyk-Zreda, 2018) and the results of the case study presented in this paper indicate HRM strategic role in IT organizations. Since a large number of these organizations operate in the global market, the challenge is even greater because the business needs are complex while changes are continuous. HR professionals are expected to have full professional expertise, practical business acumen, and a high level of creativity to facilitate new and original solutions that should meet individual and organizational needs.

Presented research involves a fairly homogeneous group in terms of education, age, and job similarity. The differences were observed in terms of participants' needs and expectations. Contemporary organizations should foster a culture of diversity and inclusion to develop creativity and consequently, innovation. Hence, one solution is not always suitable for all employees, nor all the situations require the same HRM intervention. However, all solutions and activities related to the role of HRM in fostering creativity can be categorized into one of the modern HRM practices. The difference lies in the implementation of these practices, which is unique to each organization and depends on specific business needs. The success of implementing the proposed solutions also depends on the creativity of HRM professionals and management support.

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# CHANGES IN ENVIRONMENT, COMPANY POSITIONING AND CAREER DEVELOPMENT

Lepa Babić<sup>1\*</sup>,  
Sandra Sojkić<sup>2</sup>

<sup>1</sup>Ernst & Young,  
Belgrade, Serbia

<sup>2</sup>Msc student,  
Singidunum University,  
Belgrade, Serbia

## Abstract:

Considering the dynamic development of technology, the knowledge economy, and the overall improvement of the quality of life, new concepts have inevitably emerged in business practices within human resource management. Employment, the work of employees in a harmonious company environment, and the creation of opportunities for personal expression and progress, both on an individual and professional level, are important topics addressed in this paper. The system of values and the understanding of work ethics, as well as the ideal concept of a career, are constantly changing, and companies strive to respond to the new demands of employees who perform purposeful activities within the company, for them to fulfill their purpose: business success, social responsibility, and human resource development.

## Keywords:

human resources, contemporary environment, career development, human resource management, personal development.

## 1. INTRODUCTION

With the changes occurring daily, both in the business world and in other aspects of life, business practices in human resource management are also evolving. Globalization, the progressive growth of innovative technological solutions, demographic changes, downsizing, and high unemployment rates are the basis for these changes. The increasing share of young people in the workforce implies many talented candidates in search of employers who will facilitate their development both professionally and personally. Companies find themselves competing for the young talents, devising creative ways to offer better working conditions and paying increasing attention to human resource management. Fierce competition among employers has largely resulted in positive outcomes for young candidates, allowing them to choose between employers to get the desired working conditions (Snell, 2022).

Today's companies understand that the value of human resources is high, primarily because employees generate the value they deliver to customers and, consequently, revenue for the company, which is then reinvested in the employees' development, for mutual satisfaction. Satisfied employees, in addition to the increased productivity that enhances the company's chances of success, signal good working conditions within the company and communicate them to candidates. Talented candidates want to apply to work in a company where they will be satisfied, one that enables their development and the acquisition of new skills. Companies are compelled to adapt promptly to changes on the labor market and overall business environment if they aim to develop their business and employee network (Sharf, 2014).

Correspondence:  
Lepa Babić

e-mail:  
lbabic@rs.ey.com



## 2. LITERATURE REVIEW

The paper represents a synergy of the theoretical context and a review of relevant literature in the field of human resource management, which has been enhanced through the analysis of primary data collected through research. In the study of this topic, scientific papers on career development, career counseling, and contemporary trends in the field of human resources were used.

Human resource management is a strategically vital process for a company since employees directly impact the company's operations (Rotich, 2015). The contemporary labor market is oversaturated with employers and candidates, making it increasingly challenging to create distinctive competencies. Therefore, companies are turning to investment in their employees, transforming them into brand ambassadors. Developed technology for producing quality products and innovation, on its own, does not guarantee the success of a company. It can contribute to a company's progress only if qualified employees stand behind it (Sims 2006 & 2007).

### 2.1. Contemporary Trends in Human Resource Management

The factors that have significantly shaken the field of human resource management are globalization, rapid technological advancement, a significant generational gap between employees, unemployment, reduced workforce due to budget cuts, as well as changes in the understanding of the career concept and work ethics (Conlon, 2004). Companies need to direct their efforts towards studying contemporary trends on the labor market, creating human resource management strategies, and implementing technology and knowledge into their daily operations (Beardwell et al., 2004).

#### 2.1.1. Technology development

Changes in the field of technology have fundamentally altered the future of certain professions, business practices, internal communication, and all aspects of human life (Riccucci, 2012). With the advent of the internet, many activities have been simplified, both from the perspective of candidates and from the perspective of employees within a company. Traditional meetings have been replaced by Zoom and Teams meetings, while traditional job advertisements in newspapers and on television have been replaced by job search websites. International companies are outsourcing their call centers to countries with cheaper labor (Scullion et al., 2007). Computerization has made many professions obsolete, as they are now fully automated, but it has also given rise to new professions that require expertise in managing modern technology.

The selection and recruitment processes have been accelerated through the use of job posting websites, social media, and online candidate interviews. Thanks to technology, location and working hours flexibility has enabled remote work and a better balance between work and personal life, which are valuable benefits for employees. The development of technology has brought many advantages for human resource management but also many challenges (Dessler, 2013; Ivanchevich, 2010). Due to the arrival of international companies on the domestic market, there is a transfer of knowledge and technologies, transforming the modern labor market into a global one.

#### 2.1.2. Globalization

Information technology has not only connected the world but also brought changes like reduced cultural differences and English proficiency, allowing companies to hire globally. Job offshoring is common as production moves to cost-effective countries. Globalization broadens job options for candidates, challenging employers to adapt to the global market and enabling technology exchange. However, it can lead to lower salaries in lower-income countries. Operating globally requires HR departments to navigate diverse legal, cultural, linguistic, and ethical frameworks.

#### 2.1.3. Competition

Competition brings both opportunities and challenges for employers and candidates alike. Changes can be either good or bad, but they drive creativity, innovation, and new ways of thinking. Talented candidates and quality employers can choose, thus ensuring a variety of values are satisfied. Over time, many employers have led to an oligopoly, making international companies giants with the ability to offer the best benefits to employees in exchange for their productivity and, consequently, to hire high-quality workers. Young candidates without work experience typically get the opportunity for internships in such companies, which means career development for them and working for a company with a strong employer brand. For the company, it means the infusion of young innovative thinking and lower labor costs. Competition, in every sense, leads to greater proactivity and competition, reduces costs, and provides more choices for all players on the labor market.



#### 2.1.4. Demographic changes

Diversity in human resource management brings significant advantages for employers, but it also presents considerable challenges in adapting to different perspectives, ethnic backgrounds, cultures, and communication styles. Managing human resources that differ in terms of age, gender, education, race, religion, nationality, and culture requires extensive knowledge, adaptability, and patience. Differences should be respected and understood rather than ignored, as this is the only way to create a pleasant work environment and a flexible organizational culture. Different worldviews contribute to better ideas and team cohesion but present a challenge for managers.

When it comes to age diversity, companies today have three generations of employees, each with notable differences in their perception of work and the benefits they expect from their employers (James, 2002). Lester suggests in his work that "older employees are rigid and inflexible, younger employees are irresponsible and think they are always right, and those in the middle do not understand either the younger or older employees" (Lester et al., 2012, p. 351). Older employees embody a work culture and upbringing that emphasized loyalty to one employer, progression within one company, adaptability to all aspects of the job, and great responsibility. With changes in contemporary business, an increase in the number of employers, and higher employee turnover in companies, whether due to leaving jobs in search of better conditions or cost-cutting measures by employers, there have been changes in the perception of career and loyalty among young workers (Knowles et al., 2015). Continuous development seems more important to the younger generation, who still lack extensive work experience, so they seek companies that will facilitate their development through education and provide a strong work-life balance (McHanon et al., 2003). Young candidates have grown up in parallel with technological development and easily adapt to it, making them a valuable resource for companies, so efforts to understand their needs should not be underestimated.

#### 2.2. Career development

A career, as an abstract concept, can be understood in various ways, with a certain degree of subjectivity. Its meaning can be viewed from the perspective of the individual, but also from the perspective of the employer and development within a single company. Its scope also depends on whether a career is perceived solely in professional terms or if it represents an individual's lifelong development. In the past, it was common for employees to remain loyal to one company from the start of their career until retirement, and career development was seen

through the lens of progressing within that company's hierarchy, reaching top management positions. As workloads and responsibilities increased, so did benefits and position status (Schuler et al., 2014). Today, it is often talked about frequent changes in employers, jobs, as well as dramatic shifts in career paths and requalification (Filmer et al., 2010). In addition to the concept of a career, daily life and values have also changed, affecting expectations from employers and career development opportunities in modern times. It is crucial for employers to develop a career path for all employees to enable them to progress in their profession (Ivanchevich, 2010). Workers seek better working conditions and do not hesitate to leave an employer who does not provide the desired value package, no matter how unacceptable this may have seemed in the past. The desire for personal development and progress is particularly evident among the younger generation, that pursues lucrative professions, compete for leadership positions, and attend courses and training programs. The current job market is characterized by job insecurity and transactional relationships, which is a significant shift compared to older generations, who often spent their entire careers with a single company after securing their first job (Greenhaus & Callanan, 2006).

Career can be seen as "the role we play in life" (Zunker, 2012) if its broader context is considered. Each individual views their career in their own way, whether as professional or overall development. Companies can also view career development as an opportunity for all their employees to develop individually by working in the company, attending relevant courses based on their interests and skills. Clayton Alderfer sees a career as one of three basic needs of employees (along with existence and the need for connection with colleagues) (Alderfer, 1971).

Although the concept of employment has changed in the modern business world, the need for individuals to find a meaningful activity that aligns with their goals and interests, while providing some level of security and stability in the work environment, remains the same (Brown & Lent, 2013).

According to Super, an individual plays various roles throughout their life: family member, society member, citizen, student, partner, and someone who has their free time. Through stages and periods, while considering the influence of society, reference groups, family, and others, people develop and change their aspirations regarding careers and career development goals (Super et al., 1990).

##### 2.2.1. Types of careers

The changes discussed in the first chapter have led to the emergence of different types of careers and various understandings of the career concept. Traditional career understanding implies an employee's progression within





a single employer in a hierarchical manner (Flamholtz et al., 2004). Young people today do not accept the idea that career development requires a long period of gaining work experience and maturity. With the acceleration of life's pace, processes such as career development have also sped up, leading many young individuals to turn to entrepreneurship (Yaneva, 2018). Over time, as the workload increases due to adaptation to market changes, individuals within a company also embrace the activities of their colleagues, learning about new areas and expanding their competencies. Changes in the economy also influence frequent changes in individuals' career plans. The former security has been replaced by today's uncertainty. In this manner, employees acquire novel knowledge and attain the requisite qualifications for alternative employment opportunities. Subsequently, enticed by improved conditions offered by another organization, they opt to depart from their initial employer. Gradually, the understanding of a career ceases to be limited to one company and one type of job, as well as the responsibility of the company. It becomes an individual, multi-faceted path through various activities in different places that lead to a goal (Watts, 1998). In contrast to the earlier understanding of an employee, where their identity was closely tied to the company they worked for, along with a sense of loyalty, today an individual is employed by a company until the moment the employer ceases to meet the employee's expectations. This cycle of value exchange and satisfaction creation for both parties is an ongoing process. When one party stops receiving benefits in exchange for their engagement or work, the process ceases to function. Today, companies invest significant efforts in enabling employees to develop both personally and professionally. For example, Walmart, in addition to providing financial benefits, healthcare, and benefits related to spending more time with family, also offers various education and training opportunities for employees to facilitate their development (<https://careers.walmart.com/>). Although individuals manage their own careers today, employers play a significant role in building specific abilities and skills.

#### 2.2.2. Career development phases

When it comes to the individual, with a particular understanding of the career as a concept, their personal development begins with themselves. Self-assessment is an important initial step on the path of career development (CEB, 2002). Every individual should assess their affinities, knowledge, skills, talents, and predispositions and align themselves with a specific goal based on these traits. Employees are satisfied when they do a job they love, they are more productive, better at managing their time and activities, and consequently, they bring success to the company (White, 2012). "Choosing a profession is an expression of personality" (Holland, 1973), and later

the choice of employer is in line with personal values. For young people, the image of what their desired career development and path to success look like is usually unclear (Campbell et al., 2010). Self-assessment is, therefore, a good starting point. When knowing one's interests, skills, and talents, an idea of a desired profession can be formed. After self-assessment and observing opportunities in the environment and job market, it is necessary to set a specific goal as the beginning of the planning process. The goal is guidance in the process of finding the right path to a solution (Cappelen et al., 2015; Harris et al., 2014). When knowing the destination, the path to reach that goal needs to be determined (Tarasco et al., 2006).

### 3. METODOLOGY

To meet methodological requirements and fulfill the purpose of better understanding this area, the paper synergizes analysis of relevant literature and data collected through the research. The general scientific method used in this research is the hypothetico-deductive method. The goal of the formulated hypothesis is to prove or disprove facts, while also achieving the objectives. The sample consists of 84 respondents giving opinions on 24 statements in a survey. The hypothesis was formulated: "Candidates consider personal development to be an important factor in choosing an employer." The research was conducted through the Google Forms platform in July 2023, and the responses were assessed using Likert scale. The initial 4 questions are in the form of multiple choice and are of a demographic nature.

### 4. RESULTS AND DISCUSSION

The focus of this research is examination of the role employers play in the career development process of young candidates. It aims to understand how candidates perceive and evaluate the factors that attract them to potential employers in their professional lives. Additionally, the study explores the current business and labor market dynamics as they relate to career development.

This research involved 84 participants, encompassing both genders, with the majority being women (62.3 percent). The largest number of respondents belong to the younger age group - 18 to 35 years old (73.3 percent). A significant percentage of respondents have completed undergraduate and master's studies (64.3 percent).

The hypothesis has been confirmed based on the respondents' views: 51.2% of the respondents agree with the statement that personal development is crucial when choosing the employer, and that employers should provide employees with adequate education, training, and workshops.



Young candidates, who make up most of the respondents, aim to choose jobs that will positively impact their personal and career development. Respondents consider job satisfaction at a long-term level and have clearly defined goals, expecting the company to establish a career path. The conclusion is that the results are directly related to the age structure of the respondents. (Figure 1)

Furthermore, the research results indicate that 41.6% of respondents agreed with the statement that when choosing an employer when applying for a job, the brand and name recognition were important to serve as a steppingstone

for further career development. 28.6% of respondents were undecided in giving their opinion, while 29.8% were against it. (Figure 2)

On the market, both employers and candidates face significant competition, which is why this research has examined attitudes related to the influence of the company's brand on career development (Figure 3). It is interesting to note that 44% agreed with the statement, but a significant number disagreed (35.7%), and 20.2% of respondents were undecided.

Figure 1. The importance of education when choosing an employer.

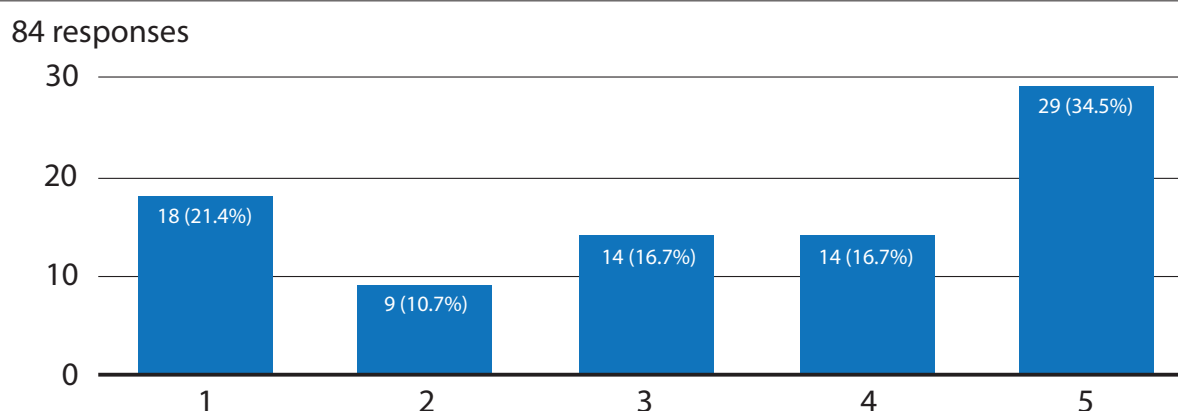


Figure 2. The importance of brand for career development.

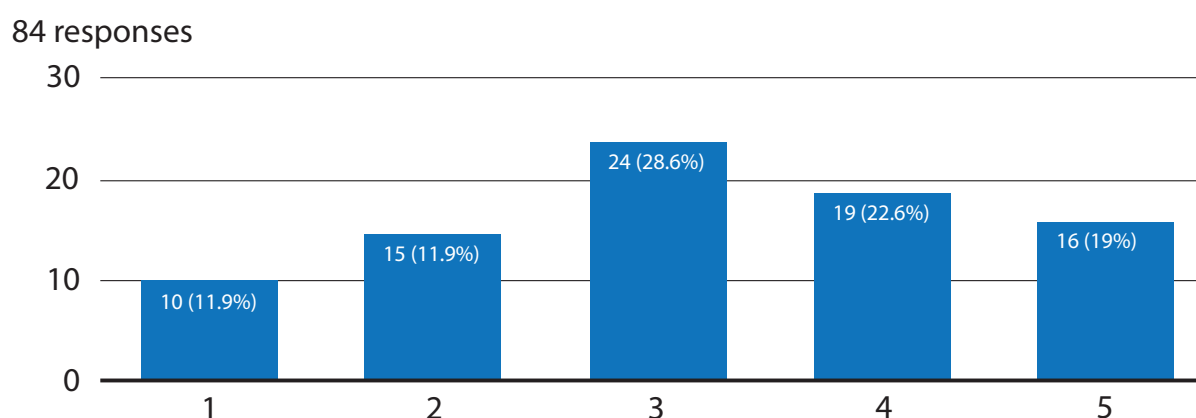
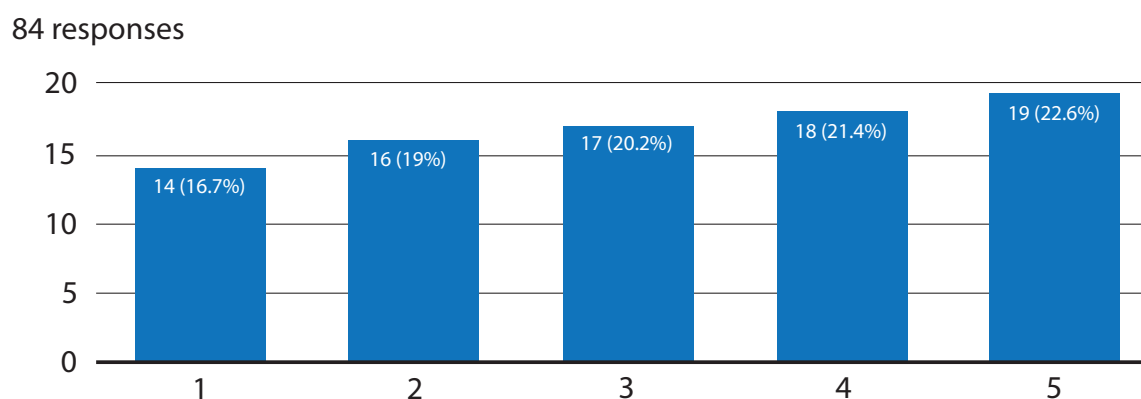


Figure 3. Company's market recognition as a factor for job applications.







Candidates aged 18 to 35, i.e., most respondents, prioritize jobs that positively impact their personal and career growth, through education. They seek long-term job satisfaction and expect companies to offer clear career paths. The research underscores the importance of employer branding in candidate choices, signaling favorable working conditions and employee happiness. Established brands are preferred for ongoing growth and future job searches. Based on the research it has been concluded that the role of the employer, as well as the company's brand, is important in career management.

## 5. CONCLUSION

Contemporary circumstances in the field of human resource management differ significantly from the past. What remains the same is the value of individuals as bearers of knowledge and skills within an organization, as well as individuals with specific interests and affinities. The progress of individual employees also affects the success of the company. This development occurs in parallel, and companies should direct their activities towards human resource management planning, from the recruitment process to creating a positive experience to be communicated to the public, as well as developing a career path that allows employees the opportunity and desire to stay and grow within the company. Globalization, unemployment, employee diversity, business liberalization, restructuring, and market saturation, coupled with technological advancements, have resulted in a global scenario with a large number of employers seeking talented candidates. Both companies and workers have significant opportunities for choice but also face intense competition.

Future research should delve deeper into the topic of employer branding's impact on individual career development and what sets apart talented employees and excellent employers. Developing employer brands, enhancing brand attractiveness, and defining the employee value proposition are crucial in the competitive landscape of attracting and retaining talent.

Specifically, further exploration should encompass the values that make an employer the best choice, including non-material benefits that candidates consider when selecting an employer and assess how creatively employers foster a positive work environment. Given that young people will soon comprise the majority of the working-age population, their attitudes are of paramount importance.

This research makes a modest contribution to understanding that talented employees seek quality employers, and satisfied employees lead to satisfied clients, fostering employer success. The exchange of value in the employment process contributes to the progress of all participants and enhances the overall quality of human life.

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# SERVANT LEADERSHIP'S ROLE IN ENABLING SUSTAINABILITY IN ORGANIZATIONS: AN OVERVIEW OF STUDIES

Ana Radulović<sup>1\*</sup>,  
Olga Epitropaki<sup>2</sup>

<sup>1</sup>Singidunum University,  
Belgrade, Serbia

<sup>2</sup>Durham University,  
Durham, England

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## Abstract:

Following the pandemic, organizations need to focus on strengthening their sustainability. As a measure of modern business success, organizational sustainability is affected by diverse factors. Nevertheless, the authors have only recently begun to examine the nexus between servant leadership and organizational sustainability. Servant leaders possess the know-how needed to successfully manage the complexities of organizational sustainability. In particular, environmentally specific servant leaders encourage pro-green outcomes in their organizations. This paper provides an overview of seven empirical studies which evaluate the effect of servant leadership and environmentally specific servant leadership on sustainability in organizations.

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## Keywords:

servant leadership, environmentally specific servant leadership, organizational sustainability.

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## 1. INTRODUCTION

Organizational sustainability entails meeting environmental, economic, and social demands without endangering future generations. It positively affects innovation in organizations, enhances management of risk and secures competitive advantage. After the pandemic, organizations need to reclaim their sustainability by demonstrating persistence, flexibility, and the capacity to rethink their routes to success. Organizational sustainability is affected by diverse factors such as organizational learning capacity, talent management, green intellectual capital, sustainable behavior, environmental human capital practices, green and employee performance (Batool, Mohammad, & Awang, 2022). Nevertheless, the authors have only recently begun to examine the association between servant leadership and organizational sustainability. Servant leaders enable their followers to actualize their full potential and motivate them to become servant leaders themselves. These leaders' actions are guided by their ethical values and they positively affect employees, organizations and communities. Therefore, servant leadership seem to be an appropriate approach to achieving organizational sustainability, which is regarded as an indicator of modern organizational success. Indeed, servant leaders possess the values, skills and willingness to successfully manage the complexities of organizational sustainability (Alafeshat & Tanova, 2019; Batool et al., 2022; Ying, Faraz, Ahmed, & Raza, 2020). Particularly, environmentally specific servant leaders can effectively model behavior of their subordinates and encourage their pro-green behavior in organizations (Gu & Liu, 2022; Hou, Gai, & An, 2023; Peng et al., 2022; Zafar, Tian, Ho, & Zhang, 2022).

Correspondence:  
Ana Radulović

e-mail:  
aradulovic@singidunum.ac.rs



This paper provides an overview of seven empirical studies which evaluate the effect of servant leadership and environmentally specific servant leadership on various outcomes in the field of organizational sustainability.

## 2. SERVANT LEADERSHIP THEORY

Servant leadership, on the surface level, appears somewhat paradoxical, as someone who is expected to lead others is also called upon to serve them. Even though this approach challenges our conventional assumptions about leadership, it also provides a unique viewpoint. This conceptualization was proposed by Greenleaf (1977), following his extensive experience in the corporate sector and desire to improve leadership processes. The essence of this approach is that servant leaders prioritize their followers over their own interests, empower them and enable to actualize their full potential by providing opportunities for material and emotional advancements (Northouse, 2021). Following, this approach is rooted in ethics since servant leaders place great emphasis on the betterment of the workplace, community and society in general.

Liden, Panaccio, and Meuser (2014) provided a model of servant leadership with antecedents, leader behaviors and outcomes. Antecedents include context and culture, leader attributes and follower receptivity. Dimensions of culture can significantly affect the manner in which servant leadership is achieved. For instance, this leadership approach may be more prevalent in low-power distance cultures (e.g. Nordic Europe), where power is evenly distributed across various layers of society. Leader attributes have a great impact on how individuals display their servant leadership since people vary according to their self-efficacy, moral development and emotional intelligence. Follower receptivity represents the extent to which a subordinate desires to be served by their leader. Servant leadership is effective when there is an alignment between a leader's propensity to serve and a follower's receptivity to being served. Indeed, Meuser, Liden, Wayne, and Henderson (2011) found that this alignment has a positive effect on subordinate output and organizational citizenship behavior and the reverse was found in the absence of this alignment.

The authors of the model propose a number of servant leader behaviors (Liden et al., 2014). Conceptualizing implies the leader understands the organization's direction, mission and intricacies. Emotional healing occurs when leaders recognize others' challenges and offer their help to overcome them. Putting followers first suggests prioritizing subordinate's interests and accomplishments above their own. Enabling followers' growth and success is achieved when leaders support follower career growth, provide mentorship and support.

Behaving ethically entails that leaders will never sacrifice their ethical principles for the sake of success. Empowering implies that leaders enable their subordinates to be independent, make decisions and be autonomous. Generating value for the community is achieved when leaders purposefully give back to the community by participating in local activities, and by motivating their employees to volunteer (Northouse, 2021).

The servant leadership outputs include subordinate performance and progress, organizational performance and impact on society. The outcomes regarding subordinates entail the realization of their full potential, effective job accomplishment and the desire to become servant leaders themselves. Servant leaders' impact on organizational performance encompasses positive effects on employees' organizational citizenship behaviors, and improved team effectiveness and potency (Hu & Liden, 2011). The outputs regarding societal impact include good treatment of employees, which results in their satisfaction and positive treatment of customers and creating jobs in the communities the organization operates (Northouse, 2021).

Robertson and Barling (2017) expanded the theory of servant leadership to the environmental sphere. Environmentally specific servant leadership (ESSL) is demonstrated when leaders guide, empower and groom individuals to become pro-environmental citizens. Leaders display authenticity, interpersonal cooperation, humbleness and support to individuals' pro-environmental efforts (Tuan, 2021). Environmentally specific servant leaders represent role models with environmental concerns who serve and enable their followers to achieve sustainable objectives of their organization and society (Faraz, Ahmed, Ying, & Mehmood, 2021). Both servant leadership and environmentally specific servant leadership have recently generated significant interest among scholars regarding their impact on individual and organizational outcomes. The following section provides an outline of the studies that documented their positive impact on sustainability in organizations.

## 3. THE EFFECT OF SERVANT LEADERSHIP ON ORGANIZATIONAL SUSTAINABILITY: STUDIES OVERVIEW

This section provides an overview of three articles in which servant leadership was examined as a key contributor to organizational sustainability and four articles which evaluate the impact of environmentally specific servant leadership on environmental outcomes. To begin with, Batool et al. (2022) investigated the impact of servant leadership on organizational sustainability. Organizational sustainability is a way of being and working that respects the ecological, societal and economic demands





without compromising the prosperity of the upcoming generations (Ong, Soh, Teh, & Ng, 2015). It favorably affects outcomes and innovation at work, improves risk management and gains competitive advantage by engaging stakeholders (Whelan & Fink, 2016). Following the COVID-19 pandemic, organizations have been trying to reclaim their sustainability by demonstrating endurance, adaptability, and willingness to explore new routes to success. In their study, Batool et al. (2022) applied quantitative methodology and collected 441 questionnaire responses from employees in the hotel industry in Malaysia. Their findings reveal that the proposed association is indirect and that operates through the mediating roles of creativity and psychological resilience. Creativity entails developing unique and relevant concepts for organizational sustainability (Amabile, 1997), whereas psychological resilience refers to the ability to demonstrate positive adjustment following stressful incidents on the job, with the aim of being more sustainable (Luthar & Cicchetti, 2000). The novelty of this study entails combining the elements of human capital and examining their impact on organizational sustainability.

Employees' Voluntary Green Behavior (EVGB) plays a vital role in achieving the targets of ecological sustainability within an organization (Ying et al., 2020). Importantly, leaders can stimulate this behavior among their subordinates. Therefore, Ying et al. (2020) examined the effect that servant leadership may have on EVGB via the mediating roles of psychological empowerment and autonomous motivation for the environment (AME). Psychological empowerment enables workers to feel competent and in charge while doing their job. This self-assurance regarding the empowerment is crucial for engaging in EVGB. The mediating role of psychological empowerment is examined since it is the essence of servant leadership. Furthermore, Autonomous Motivation for the Environment (AME) entails that one engages in behaviors that stem from one's inner goals and self-awareness (Hagger et al., 2014). Since AME fundamentally links servant leadership and EVGB, it is examined as the mediator of this relationship. The results based on dyadic data provided by 315 supervisor-subordinate pairs in the electric industry in Pakistan showed that the impact of servant leadership on EVGB is simply and serially mediated by psychological empowerment and AME. This research advances our understanding of how servant leaders may endorse environmental benefits in organizations among staff members.

Alafeshat and Tanova (2019) examined the ways in which servant leadership and high-performance work systems (HPWS) facilitate organizational performance, conceptualized in the form of employee satisfaction and employee retention. HPWS is defined as a blend of human resources practices that enhance worker skills, attitudes and productivity so that they contribute to the sustainable

competitive advantage (Datta, Guthrie, & Wright, 2005; Saks, 2006). Longitudinal data was collected from 300 subordinates within a private airline company in Jordan on three occasions separated by a one-week time lag. The results showed that servant leadership and HPWS routines enhanced employee retention and satisfaction, which are perceived as facets of organizational sustainability. The authors further investigated the way in which this effect unfolded and found the mediating role of employee engagement in this process. Employee engagement is viewed as a favorable employee attitude at work that instils loyalty to the organization and thus results in enhanced organizational performance and goal accomplishment (Robinson, Perryman, & Hayday, 2004). It was found that servant leadership and HPWS positively affect the results since they enhance employee engagement. Indeed, increased employee engagement leads to increased employee retention and satisfaction. Therefore, the sustainability of the aviation sector in Jordan vastly depends on enhancing employee engagement and understanding the importance of servant leadership (Alafeshat & Tanova, 2019).

Since Environmentally Specific Servant Leadership (ESSL) can contribute to the green behaviors of subordinates, Gu and Liu (2022) studied the ways in which green role modelling and employees' perception of CSR facilitate the link between ESSL and employees' voluntary green behavior (EWGB). A role model represents a perceptive construct that an individual creates on the basis of a person's characteristics demonstrated in social settings that the individual views as comparable to themselves and aspires to increase this comparability by mirroring those characteristics (Gibson, 2004). Therefore, environmentally specific servant leaders who respect and implement green policies and ecological principles are likely to represent green role models to their followers. CSR is defined as activities and procedures of organizations that consider stakeholders' prospects, as well as economic, social and environmental outcomes (Aguinis, 2011). As such, it fundamentally contributes to organizational sustainability (Porter, Kramer, Lenssen, & Smith, 2019). In particular, perceived CSR positively affects a number of individual-level outcomes such as worker creativity and performance, job satisfaction, identification, organizational commitment and organizational citizenship behavior (Gu & Liu, 2022). There are two types of EWGB behavior: in-role green behaviors, which the organization demands and rewards for a particular task (Ramus & Killmer, 2007), and extra-role green behaviors, which are employees' voluntary behaviors that the organization neither expects nor rewards (Paillé & Boiral, 2013). Gu and Liu (2022) collected survey data on two occasions from 512 employees within eight organizations in China. The results showed that ESSL is positively associated with both in-role green behavior and





extra-role green behavior of subordinates. Furthermore, it was shown that green role modeling mediates the link between ESSL and EWGB. Additionally, employees' perceived CSR was shown to moderate the mediating path from ESSL to EWGB via green role modeling (Hou et al., 2023). Gu and Liu (2022) suggest that organizations should encourage environmentally specific servant leadership and develop their own CSR policies and practices with the aim of encouraging in-role and extra-role green behaviors of subordinates, which subsequently enhance sustainability, ecological preservation and societal progress.

Considering the issues induced by unwarranted carbon dioxide discharges, companies are now faced with higher expectations for green progress and are looking for ways to enhance their green performance. Therefore, Hou et al. (2023) investigated the effect that environmentally specific servant leadership may have on organizational green performance and examined the mediating role of green creativity, as well as the moderating influence of power distance orientation in this relationship. Organizational green performance entails the efficiency of the software and hardware used in an organization's procedures regarding green goods or practices, such as energy saving, green product scheme, inhibition of contamination, recycling efforts or technological innovation. As such, green performance indicates an organization's growth potential. On the other hand, green creativity involves generating novel and applicable ideas or solutions regarding green products, services or processes. Being the foundation for general green innovation, green creativity is a stepping stone for the expansion of green products. Power distance orientation represents the extent to which people accept the unequal distribution of power within organizations. For instance, workers who score high on a power distance index are more cognizant of rank discrepancies during exchanges and thus tend to comply with decisions made by the supervisors. In contrast, those with low scores on power distance index tend to focus more on egalitarianism and are more critical of their leaders (Luo, Wang, & Tong, 2020). In their study, Hou et al. (2023) used a questionnaire to collect 576 responses from leaders and their subordinates in China. The results showed that ESSL positively affects green performance. Furthermore, green creativity mediates this relationship and power distance orientation moderates this association in a way that greater power distance orientation has yielded more significant link between ESSL and green creativity (Hou et al., 2023). This study enhances our understanding of ESSL and offers a new outlook on how to improve green performance in organizations.

Many organizations dissipate vast quantities of electrical power due to inefficient power consumption behavior. Therefore, Peng et al. (2022) investigated whether

environmentally specific servant leadership (ESSL) may enhance the energy-specific pro-environmental behavior (EPEB) of staff members within hospitals. The authors examined the mediating role of green self-efficacy (GSE) and green perceived organizational support (GPOS). Self-efficacy entails one's conviction that they are capable of effectively executing a particular undertaking (Bandura, 1977). Regarding the environmental perspective, GSE represents one's conviction that they can finalize various tasks in an environmentally friendly manner. Employees whose supervisor is concerned with ecological issues share the feeling that the organization creates a reassuring atmosphere in which their environmental outputs can be assessed favorably (Hongxin et al., 2022). Observing that an organization supports environmental programs will significantly encourage employees to behave in an ecologically aware fashion (Karatepe, Hsieh, & Aboramadan, 2022). Peng et al. (2022) collected data from 316 hospital employees in Pakistan via a survey. The results showed that a servant leader with green inclinations could significantly stimulate workers' EPEB, while GSE and GPOS mediated this link. The outcomes of this study could be beneficial to the medical field which could more efficiently decarbonize its processes by enhancing the power saving behavior of workers via ESSL, GSE and GPOS (Peng et al., 2022).

Since environmental processes and development of CSR depend on leaders, Zafar et al. (2022) studied the impact that environmentally specific servant leadership may have on triggering voluntary pro-environmental behavior of employees. Voluntary pro-environmental behavior (VPEB) represents the deliberate engagement of employees in the activities that concern protecting the natural surroundings above their job requirements (Lamm, Tosti-Kharas, & Williams, 2013). These behaviors contribute to the ecological performance of organizations, as well as to the general performance of organizations and their workers. Indeed, voluntary green behavior is consistent with beliefs, objectives and values of ecological and social responsibility. Environment leaders tend to inspire subordinates' identification with the organization, which contributes to their feelings of belongingness, partnership and identity (Al-Ghazali, Gelaidan, Shah, & Amjad, 2022). This identity enables employees to decidedly participate in VPEB in order to benefit their organization (Teng, Lu, Huang, & Fang, 2020). Data were collected from 434 employees within the textile industry in Pakistan via a questionnaire. The results showed that environmentally specific servant leadership affects VPEB in a serial mediation model involving psychological empowerment and organizational identity. This psychological process in organizations provides insights as to how organizations may obtain a superior level of sustainability and may enhance their ecological undertakings.



## 4. CONCLUSION

This paper provides an overview of seven empirical studies which examine the impact of servant leadership on various outcomes regarding organizational sustainability. In particular, servant leadership was found to positively influence employee creativity, psychological resilience, psychological empowerment, autonomous motivation for the environment (AME), employees' voluntary green behavior (EVGB), employee engagement, employee retention and satisfaction. Moreover, environmentally specific servant leadership (ESSL) was found to enhance green role modeling, employees' voluntary green behavior (EVGB), green creativity, organizational green performance, energy-specific pro-environmental behavior (EPEB), green self-efficacy (GSE), green perceived organizational support (GPOS), voluntary pro-environmental behavior (VPEB), psychological empowerment and organizational identity. Therefore, both servant leadership and environmentally specific servant leadership represent powerful tools for achieving organizational sustainability.

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# KEY INDICATORS OF THE QUALITY OF HUMAN RESOURCE POLICIES AND ACTIVITIES

Daliborka Đukić<sup>1\*</sup>,  
Filip Unić<sup>2</sup>

<sup>1</sup>The First Economics School,  
Belgrade, Serbia

<sup>2</sup>Recruitment Lead, MiNDS doo,  
Belgrade, Serbia

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## Abstract:

The era we live in is characterized by discontinuous changes that impose the necessity for the company's leadership to seek out new sources of competitive advantage. Innovative technology is no longer the dominant basis of differentiation. In the 21<sup>st</sup> century, marked by the rapid proliferation of technological innovations, a paradox that underscores the enduring significance of individuals as the primary drivers of differentiation emerges. Everything comes from human ideas. People innovate processes, define the production program, implement financial strategies. This leads us to the evolution of human resources management from an administrative to a strategic function, which allows it to connect people and organizational performance in a specific way. As the basic problem of human resources management is the lack of quantitative indicators and the causal relationship between investment in people and yield, a space for a set of indicators of quality of HR policies and practice is created. For the management, they represent a specific source of information and guidance for decision-making. The paper starts from the theoretical basics of human resources management, key indicators of the quality of HRM activities are presented, the discipline of human resources accounting is critically presented. The results of the research show that there is an insufficient development of human resources management in relation to the EU and countries in the region, but they show a tendency for improvement.

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## Keywords:

human resources management, quality of HR policies, human resources accounting.

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## 1. INTRODUCTION

Given that the 21<sup>st</sup> century is indeed the era of the internet revolution and changes in the behavior patterns of all economic entities, it is crucial to find an adequate response to the emerging situation. Therefore, company management turns to people, and measures the quality of human resource policies, realizing that people are the primary generators of competitive advantage. According to Ocean Tomo Study of Intangible Asset Market Value from 2020, intangible assets are now responsible for 90% of all business value.<sup>1</sup> The conventional approach views the human resources function as administrative and does not consider its strategic dimension. With the change in the paradigm of companies and the shift of the economy and management towards behavioral aspects, qualitative elements of business gain importance. Furthermore, the development of practice and theoretical literature in this area further affirms Human Resource Management (HRM). Today, it is advocated that people are the most important resource of any organization. These changes imply the desire of management to measure employee performance and examine the quality of human resource policies for control and improvement. The aim of this paper is to explore the way information is used and decisions are made regarding human resource management policies.

Correspondence:  
Daliborka Đukić

e-mail:  
daliborka.djukić@gmail.com

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1 <https://oceantomo.com/INTANGIBLE-ASSET-MARKET-VALUE-STUDY/>





Additionally, the authors' desire is to contribute to breaking the prejudices about the impossibility of quantifying the human resource management process. Moreover, this paper aims for an integrated and interdisciplinary approach to the study of HRM, linking it with finance, accounting, and psychology. The methods used in this paper include description, comparative analysis, and desk research. The description method helps in presenting the characteristics of contemporary HRM and tools for analyzing its policies. Comparative analysis is used to compare the prevalence and quality of HRM practices in Serbia, the EU, and some countries in the region. Finally, desk research is the method used to collect and process secondary data on the mentioned topic.

## 2. STRATEGIC DIMENSION OF HUMAN RESOURCE MANAGEMENT

Over the past 20 years, there has been a shift in the positioning of human resource management from a peripheral function to one of the main functions within companies. This evolution is due to changes in the environment, the search for new competitive advantages, increased organizational flexibility, the emergence of new employment arrangements, and so on. Human resource strategy can be seen as a company's intentions regarding employee management expressed through policies, philosophy, and procedures (Torrington et al, 2020). The strategy exists even if it is not explicit or written on paper. Strategic human resource management involves planning the use of human resources and activities to achieve the organization's goals. This concept emerged in the 1980s in the United States (Bogićević Milikić, 2017) and represents a new version of human resource management, constantly linked to organizational strategy.

In relevant literature, three theoretical models of strategic human resource management are recognized:

1. The Universal Model<sup>2</sup> advocates the existence of one best way to manage human resources within a company. This model emphasizes the fact that a high level of commitment is associated with high performance, without taking into account the competitive strength of the company. Guest suggests that the goals of human resource strategy are:
  - Strategic integration, which involves the full involvement of the human resources department in strategic planning;
  - Commitment, which refers to employees' perception of themselves as part of the company;

- Flexibility, which entails adaptability and modification in response to changes;
- Workforce quality.

2. The Fit Model<sup>3</sup> involves two forms of fit: external (where HR strategy fits into business strategy) and internal (when all HR policies within the HR department are aligned).

Between these two approaches lies the Harvard Model of HRM, which considers the interests of stakeholders and situational factors. This model is based on two main factors that influence the selection of human resource policies: stakeholder groups (shareholders, management, government, community, and unions) and situational factors (workforce characteristics, labor market, technology, legal, and social values). When the impact of these two groups of factors is analyzed, and work systems, compensation policies, and employment policies are formulated, the results are related to commitment, competencies, cost-effectiveness, and group alignment. All of these actions are taken with the aim of achieving favorable long-term consequences such as organizational effectiveness, individual well-being, and societal welfare.

3. The Resource-Based Model<sup>4</sup> emphasizes the importance of human resources in achieving competitive advantage. It argues that a company should continuously improve its employees' competencies to achieve its goals. Personal aspirations and employee goals should not be forgotten on this path.

One of the recent trends in human resource management is the consistency with the philosophy of total quality management, which focuses this function on customers. When we say customers, we mean managers, employees, or the strategic management team. Line managers cooperate with HR managers, making them clients. The strategic management team seeks analysis and solutions for people-related issues, and employee rewards fall within the HR sector, so employees can also be defined as clients.

### What is the current situation regarding HRM development in the region?

According to some data and research that conducted a comparative analysis between Slovenia and Serbia (Table 1), the situation is as follows:

1. In only 24.3% of Serbian companies, the head of the HR department was involved in the Board of Directors. This is significantly lower than the average for the European Union (55%) and Slovenia (57%).
2. In 55% of Serbian companies, performance assessment of the HR department is conducted. In Slovenia, this happens in 33% of cases, and in the EU, it is 39% of surveyed companies.

2 Torrington, D., Hall, L. & Taylor, S. (2020). Human resource management. Edinburgh: Pearson Education Limited, p. 69

3 Same, p. 67

4 Same, p. 69



**Table 1.** Primary Responsibility for Human Resource Policy Decisions (% of Companies).

	Slovenia (1999-2000)	Average EU (1998-1999)	Serbia (2006-2007)
<b>Recruitment and Selection</b>			
Line Manager	11	7	33.3
Line Manager in collaboration with the Human Resources Department	35	40	23.3
Human Resources Department in collaboration with Management	45	43	30
Human Resources Department	9	10	13.3
<b>Training and Development</b>			
Line Manager	13	7	37
Line Manager in collaboration with the Human Resources Department	32	38	13
Human Resources Department in collaboration with Management	46	44	33
Human Resources Department	9	11	17

Source: <http://www.doiserbia.nb.rs/img/doi/0038-0318/2009/0038-03180902157B.pdf>

3. The assessment of cost-effectiveness of the HR function is done by 32% of companies in Serbia and 36% in Slovenia.

It can be concluded that Slovenia is closer to EU results than Serbia for multiple reasons. First, the competencies of human resource professionals in Serbia and Slovenia differ. In Slovenia, studies and courses in this field have been available since the mid-1950s, while in Serbia, this happened much later. To adopt a strategic mindset among professionals in this field, it is necessary to acquire qualifications in business, human resource-related technologies, and change management. As much as 43% of employees in the human resources sector in Serbia have less than five years of experience in this field. The second reason relates to the traditional view of the human resources sector as predominantly administrative in Serbia. Third, in Serbia, it is rarely advocated that human resources are a source of competitive advantage. Instead, belief in technology and competitive advantage based on a company's financial strength is prevalent. As the fourth factor, a high degree of centralization and autocratic leadership is mentioned in Serbia, resulting in the formulation of strategy by a narrow circle of people without consulting line or middle managers.

### 3. INDICATORS OF HUMAN RESOURCE MANAGEMENT SUCCESS

In this field, the first work was published in 1984 by Jack Fitz-enz and is titled "How to Measure Human Resource Management." Later works are the result of the joint efforts of the Saratoga Institute, the American Society for Personnel Administration, and the Society for Human Resource Management. Now, we can list over 40 metrics

used to analyze the quality of human resource policies. As previously mentioned in the first part of this paper, human resource management is a complex set of activities. Accordingly, the set of success indicators in these processes is also numerous. There are various ways to classify these indicators, and in this paper, they will be classified based on the following activities:

1. Workforce Diversity
2. Organization of the Human Resource Management Function
3. Recruitment and Hiring
4. Employee Compensation
5. Employee Turnover

#### 3.1. Workforce Diversity

The term "workforce diversity" began to be used in the mid-1980s. Marginalized groups have less authority than others and are reserved for entry-level positions. There are still prejudices about specific groups. Workforce diversity can be measured in various ways, usually reduced to the participation of certain groups in the total workforce percentage, their rights, and obligations. Recruiters in the human resources sector insist on workforce diversity for innovation, maximizing talent potential, generating more ideas, and improving financial performance.

#### 3.2. Organization of the Human Resource Management Function

Key indicators of the quality of the organization of the human resource management function include: HR management costs per employee, average salary of employees



in this sector, the share of HR sector costs in total operating costs, the share of outsourcing costs in HR sector total costs, and the number of employees in the organization per one HR sector employee.

According to Gartner, most HR functions are spending between USD 1,350 and USD 3,800 per employee in 2018.<sup>5</sup>

### 3.3. Recruitment and Hiring

When discussing recruitment, it is defined as the process of attracting a sufficient number of quality candidates to fill job positions. Within this group of indicators, it is necessary to mention the following:

1. **Source of Candidates:** This method assesses how candidates came across job openings. It can be through referrals, job postings on websites, agencies or cooperatives, job fairs, or collaboration with universities.
2. **Selection Ratio:** This is the ratio of the number of hired employees to the total number of candidates in the organization.<sup>6</sup>
3. **Cost per Hire:** This is calculated by dividing the total recruitment costs by the number of recruited candidates. Internal costs include recruiter time (average hourly rate times hours spent on recruitment), manager time (manager's hourly rate times hours spent on recruitment), employee onboarding time (employee's hourly rate times hours needed for orientation), lost productivity, etc. External costs include advertising expenses, agency fees, candidate-related costs, training costs, etc. According to research by the Society for Human Resource Management, this amount ranges between \$3,000 and \$5,000, depending on the size and industry.<sup>7</sup>
4. **Recruitment Effectiveness:** Often measured by the yield ratio, which is the ratio of candidates who successfully completed the recruitment process to the number of candidates who entered the recruitment process. This can be illustrated with a job posting for an HR administrator position. 250 candidates applied, but only 50 resumes were suitable (yield ratio 5:1). Of these fifty resumes, ten candidates were invited for an interview (yield ratio 5:1). Only 5 out of 10 candidates attended the first interview (yield ratio 2:1). Out of those five, two made it to the final interview (yield ratio 5:2). One received a job offer (yield ratio 2:1), and that person accepted the offer (yield ratio 1:1). Recruitment effectiveness has significantly improved in recent years thanks to numerous software solutions that enable automatic resume scanning and, consequently, the selection of the best candidates.

### 3.4. Employee Compensation

Two common forms of evaluating employee compensation systems are the compa-ratio and turnover analysis. **Compa-ratio:** This is used to assess an individual's position in the pay range. It's calculated as the ratio of an individual's current salary to the midpoint of their pay range, multiplied by 100 to express it as a percentage. A compa-ratio of 100 means the actual salary matches the organization's pay policy. A compa-ratio above 100 indicates the employee is paid more than the company's policy, while a compa-ratio below 100 indicates the employee is paid less (Brown, K. 2018). **Turnover Analysis:** This is performed when a new employee is hired at a lower salary than the previous worker in that position. Turnover analysis is calculated using the following formula:

$$\frac{\text{Total turnover rate in general or individual wages}}{\text{Total percentage increase in average wages}} \quad (1)$$

Other indicators used in practice include:

1. **Average salary increase;** Indicates the competitiveness of the company in the labor market.
2. **Number of recommendations for reclassification vs. the total number of employees:** Reflects the company's competitiveness in the labor market.
3. **Percentage of overtime hours:** Reveals work-life balance and potential burnout.
4. **Ratio of the average salary in the company to the average salary in the industry or society:** Indicates the company's competitiveness in terms of compensation.

### 3.5. Turnover

The turnover rate is calculated as the number of employees who leave the organization during one year divided by the average number of employees in the organization. The result is multiplied by 100 to express it as a percentage.<sup>8</sup> Another way to measure turnover is the employee stability index, which is the ratio of the number of employees who have been with the organization for more than a year to the number of employees a year earlier. Managing turnover is important due to the costs associated with this process. There are direct and indirect costs related to replacing workers. Direct costs include advertising, training, time spent on filling the job vacancy, and selection costs. Indirect costs include orientation costs for new hires, decreased productivity, and costs related to the departure of candidates, such as the time spent (Table 2). The cost of turnover can also be calculated by multiplying the last year's salary by a coefficient ranging from 1.5 to 2.5, according to research by the Society for Human Resource Management annually.

<sup>5</sup> <https://www.gartner.com/en/human-resources/trends/budget-staffing-report>

<sup>6</sup> Sturman M. (2003). Utility analysis: a tool for quantifying the value of hospitality human resource interventions. *School of Hotel administration collection*

<sup>7</sup> <https://resources.workable.com/tutorial/faq-recruitment-budget-metrics>

<sup>8</sup> Bogićević Milikić B. (2017). *Menadžment ljudskih resursa*. Beograd: CID ekof. p. 524.



**Table 2.** Turnover Costs of Nurses per Employee in Australia.

Type of Costs	Activity	Amount
Direct costs	Advertising and Training	913\$
	Vacant Positions	21878\$
	Recruitment	1554\$
Indirect costs	New Employee Orientation	5072\$
	Productivity Decline	7380\$
	Employment termination	12457\$

Source: Roche M., Duffield C., Homer C., Buchan J. & Dimitrelis S. (2015).

Factors that are significant for turnover planning include job demand, resource mobility, and employees' psychological well-being. One method for turnover management is the analysis of employee satisfaction and exit interviews. Employee satisfaction analysis is a proactive tool that can help prevent further departures from the organization. It's essential to utilize the information gathered from employee satisfaction surveys effectively and generate practical ideas based on them. Exit interviews, on the other hand, are a reactive tool that forms an impression of the departing candidates and provides suggestions for improving human resource management processes.

#### 4.FINANCIAL TREATMENT OF HUMAN RESOURCES

Human resource accounting can be defined as a paradigm and a set of metrics for quantifying the effects of human resource strategies using costs and the value of people as an organizational resource. Human resource accounting is essential because it provides a framework for modern human resource management while also offering information for defining further guidelines regarding personnel strategies and policies. Regarding the financial treatment of human resource costs, it's necessary to mention that the primary use of these costs is to calculate indicators of human resource management success within the organization and for budget control. Currently, there is no international financial reporting standard that regulates this area, but International Accounting Standard 38<sup>9</sup> related to intangible assets allows for the valuation of non-material assets. Unfortunately, human resource costs are not found in reports for investors, which raises issues. In financial statements, the line item "total assets" does not clearly indicate the value of human capital, and there are no indications of how much an organization has invested in its employees. Traditionally, accounting treats every dollar spent on investing in employees as a period cost.

This means that the company's result will be lower during investment periods, leading to the paradox of worse performance when, in fact, the company begins to prosper by investing in its employees. This can create a conflict between long-term and short-term goals, potentially leading to shortsightedness in employee investment by traditional accounting.

There are several methods to overcome the problem of presenting human resource costs in financial statements. The first option is to create a separate report in which all significant investments in human resources will be shown. The second option is to include these costs in the intangible assets report, categorizing them by types. This method was proposed by Arthur Andersen & Co. and allows for a breakdown of intangible asset costs by categories. The third method is to include these costs in a financial report that is not subject to audit.<sup>10</sup>

##### 4.1. Valuation of Intellectual Capital

Intellectual capital can be defined as invisible assets, including employees' competencies and business knowledge that are beneficial for a company's operations.<sup>11</sup> Two key elements of the intellectual capital framework are strategy and measurement. Strategy refers to the acquisition of knowledge and its impact, while measurement pertains to human resource accounting and the financial framework. When it comes to the valuation of any asset, it essentially means assigning a monetary value to a particular category. In the valuation of intellectual capital at the organizational level, whether it's monetary or non-monetary valuation, the value-added coefficient of intellectual capital is often used (Table 3).

9 <https://www.ifrs.org/issued-standards/list-of-standards/ias-38-intangible-assets/#:~:text=IAS%2038%20sets%20out%20the,monetary%20asset%20without%20physical%20substance.>

10 Flamholtz E. (1999). *Human resource accounting*. New York: Springer science+Business media. str. 34.

11 Same, p. 548.

**Table 3.** Methods for Valuation of Intellectual Capital.

	Nemonetary valuation	Monetary valuation
<i>Organizational intellectual capital valuation</i>	Intellectual Capital Index Business IQ	Market-to-book value ratio Tobin's Q Invisible balance sheet Calculated intangible value Added economic value
<i>Individual intellectual resource valuation</i>	Scandia Navigator Balance Scorecard Intangible Assets Monitor Value chain score board Dynamic intellectual capital valuation Danish guidelines MERITUM guidelines Value creation index Intellectual capital rating	Human capital cost accounting Inclusive valuation methodology Intellectual property valuation Technology Broker The value explorer

Source: Radić S. (2016).

Hermanson developed two methods for evaluating human capital. The first method is called the Unpurchased Goodwill Method<sup>12</sup> and assumes that the reason for achieving a return rate higher than the industry average lies in high-quality individuals who are not included in official financial reports. The advantages of this method include objectivity and cost-effectiveness, as it utilizes all information from publicly available sources. The main limitation of this model is that earning is influenced by various factor, so goodwill does not belong to HR alone. Second, the model does not suggest how to estimate the contribution rate of HR to determine the HR value. When the industry as a whole is declining, the valuation of goodwill based on HR as suggested by the model does not explain the valuation (Das et al, 2012)

Human capital is calculated using the following formula (Table 4):

$$(PU - LAU * rB) / rB \quad (2)$$

*In this formula:* PU represents the profit of company U, LAU stands for the assets of company U, rB is the efficiency rate of the sector (expressed as sector profit as a percentage of total assets, e.g., 10%).

## 5. CONCLUSION

In this paper, we explored the application of key indicators of HR quality policies in contemporary practice. We examined the dimensions of HR management, the impact of HR policies on a company's value, the economic justification for using HR information systems, and the importance of specific indicators for making business decisions related to HR policies and overall business strategy. Based on the research results, several conclusions can be drawn. Firstly, human resource management has both value and cost dimensions. HR roles include strategic, operational, and administrative functions. The strategic role adds the most value (comprising 60% of the total value created by these three roles), while having the lowest cost dimension (only 10% of the total costs of all three roles). The administrative role has the highest cost dimension (60% of the total HR costs) but the lowest value dimension (around 10% of the total value of all three roles). Secondly, a connection was established between the HR system and the accounting value of a company. As early as 2001, Becker demonstrated that a 35% improvement in the HR system resulted in a 10-15% increase in accounting value.

**Table 4.** Human Capital Valuation Example.

Company	A	B	V	G	Sector Average
Total assets estimated by market value	100	50	200	150	125
Annual profit	15	5	25	5	12,5
Profit as a percentage of total assets	15%	10%	13%	3%	10%
Excess profit/loss compared to the average	5%	-	3%	-7%	
Human capital	50	-	50	-100	

Source: Streich D. (2009).





The essence is to identify key indicators of HR policies and practices in HR management, monitor them, and continuously improve them. This allows for measuring improvements in the HR system. The conclusion that there is a positive relationship between improving HR practices and activities and the growth of accounting value is somewhat logical. Companies that invest time and money continuously in their employees and improve their HR strategies will undoubtedly be perceived more favorably by their investors.

In conclusion, there has been a significant shift and progress in the HR system. From a traditionally administrative and secondary function to a strategically important supporting function in a company, it took a lot of effort, work, and research. The hard work of numerous HR experts and changes in the social and other frameworks in which the competitive game is played have helped the affirmation of HR management and increased its prevalence.

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# THE IMPACT OF EMPLOYER BRANDING ON THE IT RECRUITMENT PROCESS

Maja Mirović<sup>1\*</sup>,  
Nataša Stanišić<sup>2</sup>

<sup>1</sup>Student,  
Singidunum University,  
Belgrade, Serbia

<sup>2</sup>Singidunum University,  
Belgrade, Serbia

## Abstract:

In the fast-paced world of IT recruitment, the significance of employer branding has grown immensely. This research explores the substantial impact of employer branding on the hiring of IT professionals. Faced with a competitive market and a continuous demand for skilled IT talent, organisations must distinguish themselves to attract top candidates. This research investigates how a well-defined employer brand can significantly impact the recruitment process in the IT sector. It explores the critical elements of an effective employer brand, such as the company's mission, values, work culture, and employee value proposition (EVP). Furthermore, it delves into the strategies and communication channels that resonate with IT professionals, emphasising the importance of online platforms and IT-specialised recruitment methods. The findings highlight the strong link between a robust employer brand and successful IT recruitment, revealing effective strategies for securing top talent in a competitive landscape.

## Keywords:

employer branding, recruitment, IT.

## 1. INTRODUCTION

In today's dynamic business environment, attracting and retaining qualified talent is a key challenge for organisations. The concept of employer branding is gaining increasing importance. Employer branding refers to the strategy by which organisations build their identity as an employer, and communicate their values, culture, and employee benefits, to attract the most qualified candidates. This process is increasingly recognised as a key factor in successful recruitment and building a formidable team. Through this paper, we will explore various aspects of employer branding and its role in recruitment, providing insight into the significant link between effective employer branding and the successful attraction of qualified candidates. Through the analysis of relevant theoretical concepts and a case study, we will consider the recruitment process and the application of employer branding in practice, to provide a deeper understanding of this topic and its impact on modern organisations.

## 2. EMPLOYER BRANDING

The term employer branding refers to the creation and maintenance of an ideal image, as well as the corporate identity of the company. The term itself was mentioned for the first time in 1990 by Simon Barrow, and then, together with Simon, Tim Ambler defined the term employer branding in 1996 (Barrow & Ambler, 1996). Employer branding includes the opinions of employees, impressions that candidates have obtained through job advertisements, social networks, job interviews, as

Correspondence:  
Maja Mirović

e-mail:  
maja.mirovic.19@singimail.rs



well as information provided by acquaintances who work at that company. All these components together shape the company's reputation and image as an employer both in the public and among potential candidates. Every employer has its own brand, which can be positive or negative. That is why it is important to actively work on building and improving the brand. The importance of employer branding is becoming more important day by day, and internal and external branding are equally important. Employer branding is key to building a reputation, attracting candidates and talents, employee retention, preventing dissatisfaction in the workplace (The Value Of Employer Branding, 2023).

### 2.1. How to successfully define the company brand?

Defining the brand involves shaping the identity and positioning of both the organisation and the employer within the market. It aims to build a brand that attracts and retains the target group, builds trust, and creates long-term brand value. For the brand to be successfully defined, the employer goes through the necessary steps. It is necessary that the employer understands the target group and researches their needs and values to be able to shape a brand that will fit well with them, clearly establish the company's mission and vision, and identify the core values to be communicated through the brand, identifies brand values that will differentiate it from competitors, develops a visual identity that reflects the brand's personality and values. Maintains its brand, every contact with employees (as internal branding) and every touch with the public (as external branding) must maintain a positive impression of the brand, and it is necessary that the employer monitors and adjusts the performance of the built brand, analyses the results and measures success, because defining the brand is a process that is constantly being developed.

Defining an employer's identity involves crafting a mission, vision, and brand values. The mission clarifies the organisation's actions and goals, while the vision outlines an inspiring future. These elements should complement each other. Brand values define the organisation's beliefs, forming its foundation (Brand Identity, 2023). Brand communication encompasses all elements forming a brand's identity. It should be authentic, appealing, and relevant to establish an emotional connection with the target audience (Brand communication, 2023). Creating a visual identity involves corporate design, which includes elements like logos, typography, colours, and layout. Consistent use of this design across communication channels enhances brand recognition and awareness, setting it apart in the market and forging emotional bonds with the audience (den Held, 2023).

Internal branding involves establishing a brand identity within a company and ensuring it is embraced by employees. The primary aim is to empower, motivate, and align employees with the organisation's goals and values. This is achieved by communicating the brand's vision, mission, and values, offering training and support, fostering teamwork, and recognising achievements. Strong internal branding leads to higher employee engagement, loyalty, and productivity, which, in turn, enhances external branding and the company's market reputation (Mitchell, 2002). The Employee Value Proposition (EVP) is a unique set of offerings that a company provides to employees as part of its business strategy. It includes benefits, values, work culture, and growth opportunities in exchange for their commitment. The EVP is crucial for employer branding, aiming to establish the company as an attractive employer. Its key goals are attracting, retaining, and motivating talent while nurturing long-term relationships. An effective EVP sets the company apart in the job market, attracting candidates who align with its culture and values. Key components of EVP include benefits, career development, work culture, business mission, and work experience (Šta je EVP?, 2023).

External employer branding encompasses the strategies and practices a company employs to cultivate and uphold its brand image in the external sphere, focusing on how it projects itself as an appealing employer to the broader community. Establishing a positive reputation is crucial for drawing in high-calibre talent. This entails activities such as managing online reputation, delivering favourable candidate experiences during the recruitment journey, and maintaining transparent and authentic communication with potential employees and the public. Moreover, employee engagement is a significant factor in external employer branding. Content and engaged employees can serve as brand advocates, exerting a positive influence on the organisation's image among potential candidates. Monitoring in employer branding involves collecting, analysing, and tracking data to assess brand perception and strategy effectiveness. Methods like surveys, social media tracking, feedback analysis, and retention rate monitoring are employed. Insights from this monitoring help organizations refine their branding strategies to better attract talent in the labour market. Creating a brand strategy is essential for its successful marketing. Each successfully defined brand has a different branding strategy, but they all have a focus on creating an emotionally engaging and authentic experience for their audience (Brand strategy examples, 2023).

Corporate responsibility is a crucial aspect of employer branding, as it signifies an organisation's commitment to societal and environmental responsibility. Firms practicing corporate responsibility enhance their reputation, gain a competitive edge, and achieve long-term success.



They actively engage in addressing social issues, environmental protection, human rights promotion, and community improvement. In today's business landscape, corporate responsibility is vital as consumers, investors, and employees expect companies to take ethical actions and contribute positively to society (Fernando, 2023).

### 3. RECRUITMENT

Recruiting is the second of the six processes in human resource management, following planning and succeeded by selection, employee training and development, career development, and finally, employee performance evaluation and compensation determination. The recruiting process entails identifying qualified candidates to fill open positions (Jackson & Schuler, 2009). How the recruitment process will take place depends on the economy where it occurs. Recruiting in the IT industry is quite a demanding process due to the nature of the job. Successful recruitment brings highly qualified experts crucial for the company's technological development. Organisations must be flexible and innovative to attract and retain top IT talent.

The characteristics that distinguish recruitment in the IT sector from recruitment in other sectors are Dynamism – The IT industry is changing day by day. Technologies advance rapidly, and not following trends makes evaluating and finding ideal specialists increasingly challenging. Shortage of talent – The extensive demand for senior candidates results in a talent shortage in our labour market. Technical skills - Candidates must have specific technical skills, as they significantly influence their recruitment. Technical interviews - For recruiters to know that someone is an ideal candidate, they should conduct a technical interview. Primarily, it involves a technical task, questioning, or code examination. The interview's complexity varies based on the candidate's targeted position level. Continuous learning and development - The rapid advancement of IT technologies means that professionals must continuously improve their skills and follow trends to be more attractive to recruiters. Teamwork and agility – Teamwork is just one of the characteristics of an IT company workplace and it is vital to an optimal work experience. To swiftly adjust to market changes and promptly meet market demands, candidates should possess the crucial trait of agility (Tegze, 2020). IT recruiter is a demanding position which requires professional knowledge and understanding of the specifics of the IT industry, technology, and trends.

Recruitment planning involves identifying the need for fresh staff by systematically analysing the organisation's current human resources and future requirements. This process includes job analysis to create comprehensive job descriptions, and facilitating recruitment, selection,

and performance evaluation. In the dynamic IT industry, monitoring technology trends and workforce capacity is crucial for ensuring a high-quality professional team and efficient recruitment planning (Đorđević Boljanović, 2022). Internal recruitment involves moving existing employees within the organisation, either through transfers or promotions based on qualifications and past performance. It helps retain talent, boost motivation, and reduce recruitment costs. However, it may lead to a lack of fresh perspectives and competition, potentially causing stagnation and reduced employee motivation (Đorđević Boljanović, 2022). External recruitment involves the use of various methods to bring in external experts for new positions. While it can be costly, it brings fresh perspectives and ideas to the organisation. The choice between internal and external recruitment depends on factors like the position, industry, urgency, and budget (Đorđević Boljanović, 2022). Advertising in recruitment involves creating a job description and specific job advertisements. These ads are tailored to the job description and are promoted through various communication channels to attract a broad audience of potential candidates, filling the open position (Đorđević Boljanović, 2022). Employment agencies serve as intermediaries between employers and candidates, aiding in the recruitment and selection process. They come in several types, including general agencies for all industries, specialised agencies for specific industries, executive agencies for managerial roles, temporary agencies for seasonal and substitute positions, and headhunting agencies for key expert positions within organisations. Online recruiting, which involves attracting and finding candidates through digital platforms, is increasingly popular among employers due to its wider reach and efficient candidate filtering. Various online platforms and professional networks, such as LinkedIn and specialised job websites, offer quick and cost-effective ways to connect with potential candidates. This approach also taps into a global talent pool, supplying access to a diverse range of skilled individuals (Đorđević Boljanović, Dražeta, Babić, & Dobrijević, 2020). Referral recruiting, which involves sourcing candidates through employee referrals or personal contacts, is gaining popularity due to the assumption that successful employees will recommend suitable candidates. Some organisations even offer incentives to employees whose referrals are hired. However, it can lead to issues like team homogeneity, nepotism, internal conflicts, and biased recommendations, potentially affecting the objectivity of the hiring process (Đorđević Boljanović, 2022). Recruiting through universities aims to attract and hire young talent but can be costly if scholarships are involved. On the other hand, job fairs offer a more cost-effective strategy for direct interaction with candidates, allowing employers to assess skills and present their brand effectively, while candidates gain insights into the employer and open positions.



Active talent search, particularly in IT, involves identifying and engaging highly skilled candidates, often for senior positions. This approach is commonly associated with headhunting, where recruiters actively seek out potential candidates who may not be actively job hunting. In IT, platforms like LinkedIn and Github are vital for such searches. LinkedIn offers a vast network for recruiters but requires effective search strategies, including Boolean search. Github, primarily for developers, supplies technical insights and can be filtered by location, programming language, and more. Once a candidate is found, recruiters can initiate direct contact and explore further collaboration (What is a headhunter, 2023).

Job advertisements play a crucial role in attracting candidates. They should be concise, clear, and include essential details like job title, work mode, company description, job responsibilities, qualifications, benefits, application instructions, and a transparent selection process. Common mistakes to avoid are lengthy, generic ads with irrelevant information and unclear communication (Job Advertisement, 2023). Creating visuals for social media to accompany job advertisements is essential for grabbing the audience's attention. These visuals should align with the brand identity, be informative, and tailored to the specific social media platform's image format. Engaging and creative visuals can enhance user interaction and reach a broader audience (How do you create engaging visual content, 2023).

Figure 1. Job advertisement.

### Java Developer

Belgrade, on-site

**About the company**

Our client has been a leading Serbian software company for 30+ years, specializing in the development and implementation of its own high-quality software products and solutions. The company's systems support energy production and supply, telecommunications, trade, manufacturing, public administration, pharmaceutical companies, property management, and hotels.

We are currently looking for a Java Developer (Medior/Senior) to join our client's team of more than 60 IT engineers.

**Qualifications:**

- 3+ years of experience
- Java
- Databases (Oracle, SQL)
- Spring Core
- REST web services
- A degree in a technical field or equivalent work experience
- Solid command of the English language
- Bonus: Experience with ERP systems

We'd love for you to apply, even if you feel you don't meet every requirement in this post. We are looking for great people, not just those who check every box.

**What's in it for you:**

- Opportunity for growth and development with quarterly performance reviews and promotions
- Flexible hours
- Salary range MEDIOR EUR 1300-1700 net, SENIOR EUR 1700-2100 net
- Budget for your professional development
- Private health insurance
- Annual bonuses and 13th month salary
- Sports activities
- Team building activities twice a year
- Rooftop DJ parties at the end of each month

If this sounds like you cup of Java, APPLY NOW by sending us your CV!

**The selection process is straightforward and take only 2 weeks.**

## 4. CASE STUDY

This case study focuses on the recruitment and initial interview phases conducted by "Friendly HR" for a client company seeking a candidate for a job vacancy. The process began on April 12 and concluded on June 28, 2023. The process began by creating a well-optimised job advertisement based on client-provided information. This job advertisement was published on poslovi.infostud.com to reach a broader audience. Additionally, an attention-grabbing visual for social media, specifically LinkedIn, was crafted to engage potential candidates. Active talent search techniques, such as Boolean search on LinkedIn and Recruitin.net, were employed to find suitable candidates for the role. Once potential candidates were found, personalised communication was initiated. A candidate's profile was analysed using the Crystal plugin, supplying insights into their communication style and personality. This analysis guided the creation of tailored messages for candidates. Following candidate responses, the process moved to interview scheduling. Well-prepared interview questions, employing various interviewing methods, were used to gain a deeper understanding of candidates' skills, experiences, and motivations.

Source: (Jobs, 2023).





#### 4.1. Visual for social media

The visual that will be posted on social networks, primarily on the LinkedIn platform, shows an illustration of a desktop computer on the monitor of which code in the Java programming language is written (Figure 2). The code itself prints the most essential information from the job ad, namely the position to be filled, the required experience, and the salary range. The code has a syntax error, and thus, as said in the post description, the idea is for a potential candidate to recognise it. The more users of the platform interact with the post, "like" or comment, the more "walls" the post will appear on and the greater the chance of finding a potential candidate. The post description is as follows: "If you understand what's wrong here, read the entire ad at the link in the comment!"

#### 4.2. Headhunting and candidate contacting

The Boolean search on LinkedIn and the Recruitin.net website was used for the method of active talent search for this paper. Once potential candidates were found, Github was used to determine their qualifications and required skills for the given position. Analysing the LinkedIn profile of one of the candidates that was found, using the Crystal extension on Google Chrome (Figure 3), we arrived at a way to approach him (Figure 4).

#### 4.3. Interview

The interview is a panel by way of organisation, structured type with behavioural and situational questions. The interview was formed exclusively for the needs of hiring a candidate for whom the client has a vacant position - Java Developer. Some of the questions for the interview are: What kind of work fulfils you the most? What motivates you to work hard at work? What got you interested in programming? Why did you decide to study Java? how would you behave in a situation where you have a deadline, and you cannot finish the work because someone else who has not completed their part of the work is slowing you down? Can you describe to me a situation if you would have to adapt to changes in the work environment or project? How would you adapt and how would it affect you and your work? How would you react if you had to use a programming language at work that is not characteristic of your job description? How would you overcome it? Do you have any questions?

At the end of the interview itself, it is important to mention the next steps in the selection process and to leave enough time between the candidates for questions and concerns of the candidate. In this step, it was not possible to offer a preliminary job offer as the first round of interviews was conducted by the employment agency. If the candidate successfully passes to the next round, the company does it itself, and then the salary and other benefits are negotiated, up to the signing of the contract.

Figure 2. Social media visual.



Source: (Friendly HR Job Java Developer, 2023).





Figure 3. The result of the "Crystal" analysis of the candidate's LinkedIn profile.

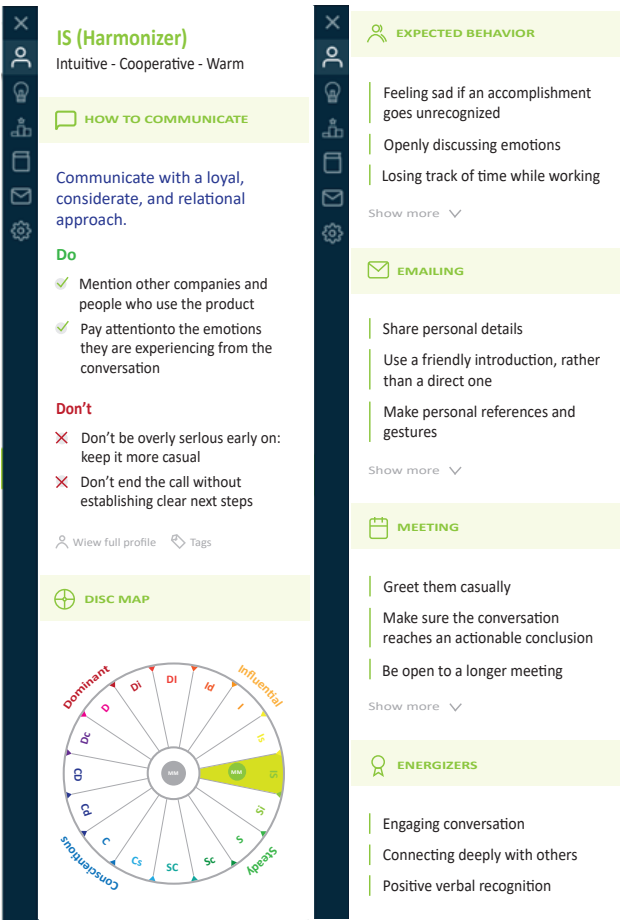


Figure 4. Example of a message sent to the candidate on LinkedIn.

Hey \*\*\*,

I hope you are well (and other formal phases). I am contacting you on behalf of the "Friendly HR" agency whose client is currently looking for a Senior Java Developer for the design development and maintenance of an ERP system. I am looking for a person who is good with Java, Oracle and SQL databases, and from looking at your profile I concluded that you have all these skills, The location is Belgrade, we work in an agile team, from the office, and the company has been working for 30 years and has about sixty employees.

The starting net salary is between 1700 and 2000 EUR with the possibility of quarterly advancement. Working hours are flexi, and a 13th salary, budgets for education, private health, and sport activities are included.

The selection process is no longer than two weeks, and I am open to all information. What do you think of this offer, do you have any questions?

#### 4.4. Case study conclusion

In this case study, we analysed the recruitment and selection process for an open position, focusing on four key activities: creating a compelling job ad, designing engaging social media visuals, actively searching for top talent, and crafting effective interview questions. The job ad was

thoughtfully crafted to attract a broad and relevant audience with clear language detailing qualifications, responsibilities, and the company's culture and brand values. Creative social media visuals effectively boosted the job opening's visibility, engaging potential candidates active on social platforms. Active candidate sourcing allowed us to discover highly qualified talent through research and



networking, with a focus on one candidate. Our interview questions, particularly situational ones, helped assess adaptability, problem-solving, and other abilities. These efforts culminated in a successful recruitment process, resulting in the ideal candidate moving to the next interview stage with the recruitment agency's client. The candidate was successfully hired on June 28, 2023.

Employer branding had a significant impact on the effectiveness of filling a position in this case study. Through the implementation of the employer branding strategy, the employment agency managed to attract a greater number of qualified candidates for the open position. This was achieved by creating a positive reputation for the employment agency as an organisation that cooperates with desirable employers that offer attractive working conditions, career development opportunities and employee support. Through this case study, it was seen that the quality of the employer's brand had a significant impact on the candidate's interest in the position. The agency actively promotes the culture, values, and benefits that the client offers to employees on social networks and other platforms. Through a visually appealing post, it created a strong impression among the target group of candidates. Also, through an active search for candidates, the company attracted potential talent who were already familiar with the brand and motivated to apply for the position. This approach to recruitment enabled a more efficient selection process. Employer branding contributed to increasing the visibility of the employment agency on the labour market, attracted qualified candidates and desirable employers, and shortened the time needed to fill a position.

## 5. CONCLUSION

Recruiting top talent is crucial for building a formidable team, and employer branding is a key part of achieving this goal. This paper supplies valuable insights into the significance of employer branding as a recruitment strategy. By effectively communicating an organisation's values, culture, and employee benefits, a compelling employer brand can be created that resonates with the target audience. This approach enables attracting the right candidates who align with the organisation's vision and values. In the digital age, potential candidates have access to a wealth of information about companies through online platforms. Therefore, a strong employer brand can create a positive perception and attract candidates, making the organisation an employer of choice. The presented case study confirms the importance of employer branding throughout the recruitment and selection process. High-quality employer branding can help organisations stand out in the labour market, attract talented individuals, and

create a positive employer reputation. This paper can serve as a foundation for further research into employer branding strategies, a crucial factor for organisations' success in attracting talent. On the other hand, a weak or negative employer brand can discourage talented individuals from considering employment opportunities with the organisation. Conducting further research into the long-term effects of employer branding on organisational development and competitiveness in the labour market is also recommended. Exploring modern technologies and trends that can influence employer branding strategies is vital to remain relevant and attract the most talented candidates in modern recruiting practices.

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# EDUCATION REIMAGINED: EY BADGES AND DEGREES

Sonja Jovanović<sup>1\*</sup>,  
Lazar Dražeta<sup>2</sup>

<sup>1</sup>Ernst & Young,  
Belgrade, Serbia

<sup>2</sup>Singidunum University,  
Belgrade, Serbia

## Abstract:

"EY Badges and Degrees can be seen as a contemporary 'symphony' of perpetual curiosity, where each 'note' represents a valuable lesson, and every day of a program is a new movement in one's career path. Lifelong learning is the art of staying young at heart and sharp of mind. It's the thrill of diving into uncharted oceans of knowledge, unearthing gems from the depths of wisdom. Like a chameleon, we adapt and evolve, painting our minds with the vibrant hues of experience. Similarly, organizations follow the same path. With each lesson learned, we weave a richer 'tapestry' of existence. In this boundless classroom, age is just a number, and the thirst for knowledge becomes the elixir of everlasting youth and constant improvement and change, reminding us that the journey is as precious as the destination. This is a story about an organization that enables people to grow, explore, and stay relevant for today and tomorrow. And it does so in a unique way."

## Keywords:

EY Badges, EY Degrees, Life-long learning, Change.

## 1. INTRODUCTION

Human nature thrives on curiosity, that relentless urge, drives us to unearth, absorb, and evolve. It is the catalyst that transforms mere existence into a journey of self-discovery and growth, enhancing both our lives and self-value. This pursuit of ideas and striving, whether personal or professional devotion, is the essence of our lasting endurance.

"The concept of lifelong learning serves as a sustainable and dynamic force that goes beyond the confines of traditional classrooms. It recognizes that our pursuit of knowledge extends beyond institutional boundaries and forms the foundation for mutual learning and the development of practical skills essential in a rapidly changing world (Güven, 2020). In reality, human aspirations extend far beyond formal education and job descriptions. We learn not for the benefit of others, but for our own personal fulfillment, driven by an innate thirst for knowledge. As Edwards Deming, the father of total quality management, once stated, 'People are born with intrinsic motivation, self-respect, dignity, curiosity to learn, and joy in learning.'" (Macht, 2016).

Drawing from Senge's timeless wisdom (1994), an ever-evolving organization with perpetual learning treats developed skills not just as mere individual possessions but tools that, when wielded, refashion the very core of the collective. He imagined a dynamic ecosystem where knowledge finds no stagnant pools, only a continuous flow that elevates all. "Organizations learn only through individuals who learn." In this narrative, Senge's legacy is a vibrant thread weaving business success tapestry.

Correspondence:  
Sonja Jovanović

e-mail:  
sonja.jovanovic@rs.ey.com



"Elevating this very concept, the multinational company Ernst & Young (EY) introduced the global initiative: EY Badges. A harmonious 'tapestry' connects the threads of exploration, growth, and fulfillment. Each EY employee holds the key to delving into the realms of personal advancement. Diving deep into subjects like curiosity, adaptability, an expansive mindset, mindfulness, and inclusion is enabled by the Leadership Pillar of EY Badges. Those eager to delve into cutting-edge technological solutions are encouraged to explore the Technology Pillar. This dynamic guide leads through the intricate realms of data science, data integration, the wonders of artificial intelligence (AI), the security expertise of blockchain, the digital fortress of cybersecurity, quantum computing, and a treasure trove of solutions from industry titans like SAP, IBM, ServiceNow, Microsoft, and much more."

"Finally, there is a business pillar – a captivating pathway that unlocks the enigmatic realms of business acumen, financial wizardry, the artistry of marketing, and the challenges of supply chain dynamics, with an array of over 25 specific industry sectors (from agribusiness and manufacturing to insurance, banking, telecommunications, oil & gas, to name just a few)."

EY Badges allow people to immerse themselves in meticulously selected e-learning resources from EY, Udemy, Skillsoft, Coursera, SAP, TED Talks, Get Abstract, and more, provoking new ideas and rethinking the future. Learning something new requires us to leave the comfort zone of our stable cognitive structure through mental re-examination and possible changes in our basic assumptions that guide our behaviour (Schein, 2016). Therefore, with each step, EY employees are not just learning; they are earning the emblem of knowledge, the Learning Badge, which represents a unique certificate of personal achievement, much like learning criteria used by academia to evaluate what knowledge and skills the trainee or student is able to demonstrate after completing a course (Spector, 2021). To go one step further and earn one of four available levels of badges, such as Bronze, Silver, Gold, and Platinum, learners are encouraged to implement what they have learned and demonstrate their knowledge and experience in the given area.

With a total of 16 badges, people unlock the door to the prestigious EY Tech MBA certificate. Alternatively, they can seize 12 badges, paving the way to the coveted Master in Business Analytics (MBAN) or Master in Sustainability (MSuS) offered in collaboration with the esteemed Hult International Business School, which holds the triple crown of accreditations. This groundbreaking initiative marks the first instance of an organization of this magnitude extending such an opportunity across its entire ecosystem.

## 2. CHANGING THE NARRATIVE WITH EY BADGES AND DEGREES

"The process of organizational learning is based on an organization's ability to acquire, develop, and transfer new knowledge (through knowledge management methods) to enhance organizational performance. These interventions ultimately shift the organization's capabilities from simple day-to-day problem-solving to a process of continuous, ongoing improvement (Cummings and Worley, 2015). This is a long-term practice with a far-reaching impact on an 'intelligent organization'.

The EY Badges program serves as a dynamic bridge to change, thrusting individuals into a realm where learning is an adventurous voyage. This transformative journey cultivates a mindset of continuous growth while transforming the ever-changing tides of industries into opportunities for evolution. With EY Badges, change becomes a matter of personal and professional metamorphosis, turning every twist and turn in this journey into a milestone toward success.

Change is imperative. However, driving an organizational change is strongly influenced by internal and external factors. Key drivers of change, such as flexibility and creative action, are often impeded by strong internal barriers deeply rooted in the current mechanistic divisions within the organizational structure (Morgan, 1998), as well as an array of external forces that shape the modern workplace (Robbins & Judge, 2022).

Within the Badges and Degrees program, change takes the spotlight, outshining traditional ranks, where the compass points toward continuous growth and innovation. The program blurs the lines between disciplines, allowing individuals to embark on an inspiring journey of transformation and boundless potential.

## 3. EY BADGES AND DEGREES: THE MINDSET AND SKILLSET

In the whirlwind of our rapidly evolving world, the EY Badges initiative has proved to be a navigational tool guiding employees toward the horizon of tomorrow's skills. It's a dynamic force that shapes talents, opening portals to transformative experiences, and etching unique paths forward. This resourceful program stands as a resilient link, connecting the dedicated EY community to the ever-shifting realms of the organization and the global job scape. However, it is not confined to the present, but extends into the future, ensuring EY employees remain steadfast while taking advantage of relevance.

Contemporary learning and development practices cannot be assessed in isolation, merely as a part of HRM function, but rather as a whole within the broader organizational context (Ford, 2021). However, no transforma-





tional change can occur without significant organizational learning and innovation. Employees must learn how to accept new behaviours and implement new strategic decisions. This typically involves a 'trial-and-error' approach, with employees undertaking new behaviours, assessing their aftermath effects in the workplace, and making adjustments if necessary. The learning process is likely to be a considerable effort with a lot of intrinsic rewinding in terms of perceiving, thinking, and behaving. Hence, it has to be governed by the organization's future vision with all the values and norms that support it, at all levels of the hierarchy, regardless of position (Cummings and Worley, 2015).

As part of NextWave's strategy, EY continues to invest in employees' skills and empower them to build the careers they want, in a way that suits them. That is why all EY employees can pursue EY Badges and EY Degrees. In the record of EY's innovation, 2017 marked the birth of EY Badges, a transformative journey of personal and professional growth that serves more as a star map, guiding participants toward the constellations of tomorrow's successes. Among these valuable achievements, EY Degrees have emerged, each holding a market value of over \$40,000. Within this prestigious collection lies the coveted EY Tech MBA, a constellation earned through 16 respective EY Badges. These badges span all three pillars, namely Technology, Leadership, and Business. Yet, the journey doesn't end there, it crescendos with the Capstone projects where mastery takes its final bow.

In the realm of opportunity, every employee is a potential protagonist, regardless of their position or rank. The EY Degrees beckon like a stage, where innovation and learning take the spotlight. To enter the program, there are two keys. The first is a bachelor's degree or its equivalent, paired with three years of professional experience. The second is a decade of professional adventures, either at EY or elsewhere.

However, this isn't just a journey for the academic elite. Seasoned employees can enter the program regardless of whether they have a university degree or not. This online qualification, awarded by Hult International Business School, is the first-ever fully accredited corporate MBA. This marks a 'first' not just for EY but for any large organization.

#### 4. EY BADGES LEARNING OFFERING

EY Badges serve as a pledge of personal skills, always ready for further improvement. Badges are 'portable,' meaning that if a holder decides to pursue a different path from EY, they will accompany this person in whatever career they choose. Hence, a Badge is a testament to personal mastery. It is not just a token, but a declaration

that a holder has delved deeper, beyond the textbook, and truly grasped the essence of the subject. For this reason, the acquired knowledge is not merely theoretical; it represents real 'know-how'."

The potential is enormous. EY offers a dazzling collection of over 300 badges, covering diverse areas such as wellbeing and quantum computing - neatly categorized into the pillars of technology, leadership, and business. Their purpose is comprehensive. The technology pillar builds the future-focused skills that EY people need in emerging and adaptive technologies, enabling them to stay ahead of the curve with innovative solutions and a strategic perspective. The leadership pillar develops the transformative mindset that EY people need, in order to lead with purpose, to inspire, and to build effective teams, thus driving organizational success. The Business pillar explains how businesses work and develops the skills needed to innovate and transform the working world.

#### 5. EXPERIENCE PART: IMPLEMENTING WHAT HAS BEEN LEARNED

"Once the e-learning modules (offered for each badge) are completed, employees are required to submit evidence of their experience in the chosen field by submitting the Experience Evidence Form. This is not just a mere testimony of achievement but a portal to reflect on candidates' accomplishments through a narrative that intertwines the scope of learning and experience as a reflection of personal discovery. This process of reflection, apart from the critical self-thinking necessary for the acquisition of knowledge, enables us to design personal patterns convenient for the next period dedicated to reflection. This is also the way organizations recognize the process of collective learning that constantly occurs in the workplace (Shaw, 2002).

In contrast, there are challenges that stand in the path of development. In this narrative, they become opportunities to showcase resilience and growth. Candidates are encouraged to discuss their mistakes and difficulties, coming from their initial attempts to implement what they have learned through internal or client projects. But the story doesn't end with the candidates' words. Upon entering the attester, a mentor on the grand stage of this path, confirms that the necessary experience has occurred, been recognized, and acknowledged."



## 6. EY DEGREES: PRE-REGISTRATION

By completing more than half of the required Badges, learners can pre-register their interest in becoming a part of the EY Degrees program and indicate which Tech MBA, MBAN, or MSuS cohort they would like to join. They also need to submit three attested Experience Evidence Forms (one for each pillar) for a quality check. The EY Masters team advises the learner of the outcome and provides feedback on the Quality Review, enabling the learner to replicate this quality standard across all their reflection papers.

Mastery of the English language is a necessary journey as learners undertake an English Language Assessment. This digital odyssey, designed for non-native English speakers, serves as a compass to ensure adeptness at the recommended English language level (defined as B2 within the EFSET test).

Once the submitted documents have been reviewed the Badges are confirmed to meet the requirements, and the Experience Evidence Forms are found to be written in an adequate business English language, learners will be formally invited via email to join the cohort."

## 7. STUDIES WITH HULT INTERNATIONAL BUSINESS SCHOOL

Hult International Business School is renowned for its skill-focused approach to education and its commitment to practical learning. It is regularly ranked as one of the top business schools in the world by three prestigious international accrediting bodies, namely AACSB International, AMBA, and EQUIS (Hult International Business School, 2023). As a global hub for aspiring business leaders, it is connected to a multitude of industries, offering students the opportunity to engage with seasoned professionals, gain insights, and potentially launch their careers. The student body mirrors a microcosm of the business world itself fostering cross-cultural communication and the ability to navigate the nuances of global business. This has proved to be truly beneficial for EY employees worldwide, as human capital constitutes the most precious asset in the market value of contemporary organizations (Ocean Tomo, 2020).

The Pillar Insight Modules consist of three sets of live module sessions, each representing one of the pillars of the Tech MBA: Frontiers of Technology Impacting Business; Leading in the Digital Era; and a Competitive Business Simulation: Applying Core Concepts. Each set will include a series of six or seven synchronous sessions, with each session lasting three hours. Every learner in the program is expected to attend and participate in each module.

Each pillar module will feature integrative simulations and varied innovative assignments. Learners are expected to be on camera, participate in critical discussions and breakout sessions, draw on key concepts, and synthesize their learning at the end of each course. The combination of the modules will help learners propose enhanced, or potentially new ways of working, further integrating their knowledge into practice.

"The capstone group challenge is the final task that EY Degrees candidates will complete under the guidance of the Hult International Business School. Candidates will work as a team to develop either an EY NextWave strategy initiative or an EY Ripples initiative, using all the combined learning and experiences from across the three pillars. The Capstone Challenge is a 10–12-week program where candidates work virtually in teams of three to five. Candidates attend a series of mandatory, virtual workshops delivered by Hult International Business School."

## 8. CONCLUSION

EY Badges and Degrees represent a modern education program, embraced by a visionary global entity. In a world where change is the only constant and the horizon of knowledge keeps shifting, the EY learning program stands as a beacon that defies convention and ushers in an era of lifelong learning like no other. It is a genuine perpetual evolution with no boundaries worldwide. Amidst the bustling realm of business, EY recognizes its most precious asset - human capital. It encourages people to step beyond their comfort zone, in order to explore uncharted realms of learning. And what is the reward for this bold journey? It is knowledge, a badge of honour, and a globally recognized testament to the dedication to professional and personal growth. It is a narrative where an organization does not just provide a service but nurtures personal aspirations, fuels career ambitions, and weaves success stories. Navigating the world of EY Badges and Degrees is a genuine partnership, a journey where EY doesn't just guide but propels. It is a world where investment is in minds, vision, and consequently, in the future of its participants.



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# MOTIVATING SUCCESS: A STUDY OF EMPLOYEE EMPOWERMENT'S LINK TO CUSTOMER SATISFACTION AND SALES PERFORMANCE

Marina Prebeg\*

PhD candidate,  
Singidunum University,  
Belgrade, Serbia

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## Abstract:

Empowering employees is a key factor in organisational success, as it boosts motivation and improves individual performance. The aim of this paper is to determine the link between employee empowerment and customer satisfaction as well as sales performance. Sixty ( $n = 60$ ) employees of a renowned insurance company in Serbia completed two surveys. Data was collected through use of surveys digitally delivered to participants. The data was analysed using SPSS 21.0. The findings of this study show a positive relationship between employee empowerment and customer satisfaction. Empowered employees demonstrate a greater sense of ownership and responsibility, leading to improved customer interactions and increased satisfaction levels. The results highlight the key role of the employee empowerment in achieving customer satisfaction and sales performance. This study provides valuable insights for managers and decision-makers who want to implement effective empowerment strategies that bring positive results for both the employees and the organisation as a whole.

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## Keywords:

employee empowerment, motivation, customer satisfaction, sales performance.

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## 1. INTRODUCTION

In the dynamic and competitive landscape of contemporary business, the link between the motivation/empowerment of employees and satisfaction of customers, as well as performance of the sales in the company stands as a crucial determinant of an organisation's success. Employee empowerment, often synonymous with motivation, represents the empowerment and encouragement of employees to take initiative, make decisions, and contribute proactively to the organisation's goals (Baird & Wang, 2010; Chen & Mau, 2009). Customer satisfaction, on the other hand, remains at the core of every business's pursuit (Davis, 2008). Consequently, organisations strive relentlessly to enhance customer satisfaction as a strategic imperative. This research delves into the complex interaction between employee empowerment, motivation, and its profound consequences on customer satisfaction levels and sales performance, offering potentially critical insights into the core of organisational success. Employees possess valuable knowledge and expertise, and their willingness to engage can be cultivated through opportunities facilitated by management, aligning with the principle of empowerment. (Baird & Wang, 2010). Despite the abundance of literature on empowerment, Dimitriadis (2005) claims that there hasn't been much empirical investigation into this topic. Additionally, especially within the insurance industry, the empowerment could be a strategy for firms to improve employee well-being or to lessen unanticipated negative effects.

Correspondence:  
Marina Prebeg

e-mail:  
marina.prebeg@grawe.rs





The notion of empowerment is outlined through two perspectives, distinctively researched by several studies (Spreitzer, 1995; Greasley et al., 2008; Boudrias, Gaudreau, Savoie & Morin, 2009; Baird and Wang, 2010; Kazlauskaite, Buciuniene & Turauskas, 2011; Abu Kassim, Yusoff & Fong, 2012): a) The structural approach encompasses policies, practices, and organisational frameworks that grant employees the autonomy to make decisions and exert influence over their work. It embodies the concept of power-sharing between employers and their subordinates. b) The approach based on psychological perspective that emphasises the extent to which individual employees perceive amount of control they have over their own actions and activities. According to Bandura (1989), rather than being entirely independent or solely dictated by external circumstances, employees actively interpret their environments and are shaped by their perceptions, not just the reality around them, while Al-lawam and other authors (2023) concluded that leadership role is pivotal in motivation of employees, thus impacting sales performance and satisfaction of customers. Consequently, employees' perceptions of their work surroundings take precedence as the main factors influencing empowerment, surpassing the objective and tangible aspects related to the context of the work itself (Spreitzer, 1996). Based on the above-mentioned studies and the overall importance of the motivation/empowerment of the employees, it is crucial that research on the topic is continuously performed, to follow the pace of changes in the business landscape.

## 2. LITERATURE REVIEW

In the contemporary business arena, the critical importance of customer satisfaction and sales performance within a dynamic market environment is undeniable (Evanschitzky, Sharma, & Prykop, 2012). It acknowledges the increasing sophistication of customers' choices and the growing competition among companies. Sales, as a cornerstone of the market, has been extensively studied, with attention given to the nuances and complexities it entails (Roman & Ruiz, 2005; Chen & Mau, 2009; Alrubaiie, 2012). The performance of sales has historical roots, with early studies by Williams (1910) and Strong (1925) focusing on sales rules and the psychology of sales representatives (Kennedy et al., 2001; Roman and Ruiz, 2005). Van Thang and Nghi (2022) highlight the importance of the management to develop strategies in order to improve the results of employees, based on empowerment methods, implying that the interaction between salesperson and customer is highlighted as a critical determinant of sales outcomes, underscoring the importance of mutual understanding and adaptability (Davis, 2008). Additionally, acknowledgment of the growing significance of customer satisfaction in today's business landscape, is now often regarded as a key indicator of organisational quality

(Divsalar et al., 2007; Shariatpanahi et al., 2001). Ghafari (2010), as well as research conducted by Mahmudian (2002) touches upon the relationship between sales strategies and financial performance, particularly in industries like food and insurance. To conclude, importance of adapting sales strategies to changing market demands and customer preferences are also of the crucial matter (Nikolaos et al., 2010). Evidently, in contemporary landscape of the business, the paramount significance of sales performance and satisfaction of customers stands as the key indicator for sustained success and market prominence, which is further explained throughout this study.

The studies conducted by Isimoya and Bakarey (2013), Rawal (2015), and Abuzaid (2018) underscore the critical link between employee motivation, that is, empowerment, customer satisfaction, and sales performance within the insurance industry. Isimoya and Bakarey's (2013) research in the Nigerian insurance sector illuminated the positive correlation between the empowered employees and heightened customer satisfaction levels, a finding that has profound implications for business success. Rawal (2015) further reinforced this notion by identifying predictors of employee engagement, shedding light on key factors that contribute to a motivated workforce. Additionally, Abuzaid (2018) demonstrated the tangible impact of employee empowerment on achieving strategic success in Jordanian insurance companies. The current scientific paper builds upon these foundational studies, emphasising the enduring importance of this topic. As businesses evolve, it remains imperative to continue researching and refining our understanding of how empowering employees directly influences customer satisfaction and, consequently, sales performance, offering invaluable insights for industry practitioners and academics alike. The primary objective of this study was to thoroughly examine the relation between employee empowerment (motivation) and both customer satisfaction and sales performance.

## 3. METHODS

### 3.1. Sample

Sixty male and female ( $n = 60$ ) employees of a renowned insurance company in Serbia completed two surveys. Approaching frontline staff at a well-known insurance company in Serbia was done with the understanding that they operate as a connection between clients and organisations, which enhances the process of service delivery (Chow, Lo, Sha, & Hong, 2006; Liang & Jung, 2010). To specify what the frontline employee positions mean, Melhem (2003) identifies several positions as frontline jobs in the insurance industry, including managers, mentors, sales representatives, insurance consultants and agents and other employees who bear responsibilities directly related to customers.





### 3.2. Procedures and Measurements

Data was collected through the use of digital surveys delivered to participants. Surveys were answered by participants and returned via mail. For the purpose of this research, two questionnaires were used. The first survey on "employee empowerment" consisted of four statements, while the second survey focused on "sales performance and customer satisfaction" consisted of 12 statements. Both surveys were based on a Likert scale, where value 1 indicates the statement "completely disagree", while the value 5 indicates the statement "strongly agree".

First survey, which focused on employee empowerment, as mentioned above, consisted of four statements: 1) I feel empowered to make decisions in my role (E1); 2) I have the authority to resolve customer issues without seeking approval from a supervisor (E2); 3) I feel that what I do belongs to me and therefore I feel responsible (E3); 4) My initiative in improving work processes is encouraged (E4).

Second survey consisted of the following statements: 1) The response of our organisation to the needs of clients (Q1); 2) Quality of communication with clients (Q2); 3) Overall customer service satisfaction (Q3); 4) Clients are satisfied with our products/services (Q4); 5) Users regularly provide feedback (Q5); 6) I believe more training and development opportunities are needed (Q6); 7) I feel sup-

ported by my superiors in my daily tasks (Q7); 8) There is room for improvement in our communication with clients (Q8); 9) Our organisation should invest more in collecting customer feedback (Q9); 10) I have witnessed positive changes in customer satisfaction during my time here (Q10); 11) I have suggestions for improving our sales strategies (Q11); 12) I feel motivated by the level of empowerment the company provides (Q12).

### 3.3. Statistical Analysis

The information was analysed using IBM SPSS 21.0. Descriptive statistics were calculated (mean values and standard deviation) for all the variables. The normality of the distribution of data was assessed using the Kolmogorov-Smirnov test and Pearson's correlation analysis was used to determine the correlation between customer empowerment and sales performance.

## 4. RESULTS

Baseline characteristics of the sample, in total, are presented below in Table 1.

Table 2 shows the values of Pearson's correlation on relationship between employee empowerment, customer satisfaction and sales performance. The main findings of this study show that there is positive correlation between

Table 1. Descriptive statistics of the sample.

Variables	Mean ± Std. Dev.
N=60	
Age (years)	41.4 ± 10.4 y
Length of employment (years)	4.6 ± 4.1 y

Legend: N: Number of participants; y: Years.

Table 2. Results of correlation analysis (Pearson's correlation coefficient).

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
E1	.001	.007	.006	.001	.017	.970	.034	.221	.617	.007	.722	.007
E2	.075	.138	.005	.006	.023	.423	.615	.465	.622	.269	.258	.391
E3	.001	.074	.032	.136	.403	.533	.018	.007	.071	.007	.238	.015
E4	.074	.032	.136	.403	.533	.018	.007	.071	.007	.238	.015	.005

Legend: E1: I feel empowered to make decisions in my role; E2: I have the authority to resolve customer issues without seeking approval from a supervisor; E3: I feel that what I do belongs to me and therefore I feel responsible; E4: My initiative in improving work processes is encouraged. Q1: The response of our organisation to the needs of clients; Q2: Quality of communication with clients; Q3: Overall customer service satisfaction; Q4: Clients are satisfied with our products/services; Q5: Users regularly provide feedback; Q6: I believe more training and development opportunities are needed; Q7: I feel supported by my superiors in my daily tasks; Q8: There is room for improvement in our communication with clients; Q9: Our organisation should invest more in collecting customer feedback; Q10: I have witnessed positive changes in customer satisfaction during my time here; Q11: I have suggestions for improving our sales strategies; Q12: I feel motivated by the level of empowerment the company provides.



many variables. Firstly, positive correlation was shown between E1 and Q1, Q2, Q3, Q4, Q5, Q10, Q12 ( $p = .001; .007; .006; .001; .017; .007; .007$ , respectively). Furthermore, positive correlation has been found between E2 and Q3, Q4 ( $p = .005; .006$ , respectively). Additionally, there was a positive correlation between variable E3 and variables Q1, Q3, Q7, Q8, Q10, Q12 ( $p = .001; 0.32; .018; .007; .007; .015$ , respectively). At last there was a positive correlation between variable E4 and variables Q2, Q6, Q7, Q9, Q11, Q12 ( $p = .032; .018; .007; .007; .015; .005$ , respectively).

## 5. DISCUSSION

The aim of this study was to analyse the relations of employee empowerment (motivation) on customer satisfaction and sales performance. The main findings of this study show the correlation between variables were statistically significant. As mentioned, results of this study show that there is a significant positive correlation between importance in employees motivation (empowerment) and its effect on customer satisfaction, as well as sales performance, closely related to the previous. Research on employee empowerment and its effect on sales performance and satisfaction of customers has started quite recently, in the last few decades as many of the scientific papers indicate (Isimoya & Bakarey, 2013; Rawal, 2015; Abuzaid, 2018).

As an example, in the Pakistani commercial banking sector, Nareem and Sait (2010) identified no discernible link between employee empowerment and customer satisfaction. However, similarly to the results of this study, the research from Isimoya and Bakarey (2013), has shown similar results on impact of employee empowerment and satisfaction of customers as well as quality of customer service. Furthermore, the study revealed that when employees possessed a significant degree of influence and autonomy in their roles, they were better positioned to take into account the unique preferences of customers, enabling them to provide a personalised level of service. The resemblance between the two studies investigating the impact of employee empowerment on customer satisfaction and sales performance can be attributed to their shared focus on evaluating the interconnectedness of these variables within their respective contexts. Another example of the positive impact of employee empowerment on performance of sales workforce is found within the study from Al-Dmour, Yassine and Al-Dmour (2019), who conducted the research and empirical study on employees in five-star hotels. Authors concluded that the impact of both structural and psychological environment had the impact on sales performance of employees. As seen from the previously mentioned studies, the employee empowerment can exert a salutary influence on sales performance across diverse industries, irrespective of sector-specific nuances.

## 6. LIMITATIONS OF THE STUDY

This study has limitations that should be considered. The first limitation is the small sample that was included in the study. Namely, by increasing the sample, the generalisation of the results to the general population would be simpler. Secondly, insurance companies are subject to change. Management structures, policies, and strategies may evolve over time, potentially influencing the validity and the applicability of research findings for implementing results in future organisations.

## 7. CONCLUSION

The study's findings indicate a positive association between employee empowerment and customer satisfaction. Empowered employees demonstrate a heightened sense of ownership and accountability, resulting in improved customer interactions and heightened levels of satisfaction. Furthermore, the findings show an important relationship between employee empowerment and sales performance, demonstrating that engaged and empowered individuals contribute to higher sales results and revenue production. The findings emphasise the critical significance of employee empowerment in improving customer satisfaction and sales performance. This study gives significant insights for managers and decision-makers who want to implement effective empowerment measures that benefit both the people and the company as a whole.

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# ECO-GUILTY PLEASURE: UNDERSTANDING THE UNSUSTAINABLE CONSUMER BEHAVIOUR

Ivana Brdar\*

Singidunum University,  
Belgrade, Serbia

## Abstract:

This paper provides insights into the psychological and social aspects of the 'eco-guilty pleasure' paradox, consumer behaviour that contradicts their sustainability awareness. The aim of this paper is to understand why individuals often persist in unsustainable consumer practices despite being aware of their negative environmental impact. By examining relevant theories and research in the field of consumer psychology and behaviour, this study offers a deeper understanding of the factors shaping such behaviour and proposes strategies for changing unsustainable habits to preserve the environment. Understanding the psychological and social mechanisms behind the 'eco-guilty pleasure' phenomenon contributes to the development of effective strategies that encourage consumers to adopt sustainable consumption habits.

## Keywords:

'eco-guilty pleasure', consumer behaviour, consumption habits, sustainability.

## 1. INTRODUCTION

In the current societal context, there is an increasing awareness of the urgency of environmental conservation and the need for sustainable living (Cakanlar et al., 2023; Kirsten & Biyase, 2023; Zeng et al., 2023). Consumers worldwide are becoming more informed about the ecological challenges we face and are increasingly making sustainable choices in their consumption (Brdar, 2023; Živković & Brdar, 2018). However, despite growing environmental awareness, there exists a paradoxical phenomenon in which consumers consciously choose unsustainable products or services, despite being aware of their negative environmental impact (Gallo et al., 2023; Jin et al., 2019; Moser, 2016). This phenomenon will be recognized as an 'eco-guilty pleasure.' It poses a challenge for researchers, marketing experts, and brands striving to promote sustainable values and encourage consumers to make more environmentally responsible choices. The question arises: why do consumers, despite their awareness of ecological implications, often succumb and opt for unsustainable consumer options that satisfy their immediate desires and needs? The aim of this paper is to gain a deeper understanding of the psychological and social mechanisms behind the 'eco-guilty pleasure' phenomenon to identify key factors influencing such consumer behaviour. Through this insight, we intend to provide guidelines and strategies to help overcome this paradox and encourage consumers towards more consistent sustainable choices.

Correspondence:  
Ivana Brdarć

e-mail:  
ibrdar@singidunum.ac.rs





## 2. LITERATURE REVIEW

### 2.1. Theories of consumer behaviour and sustainability

Theories of consumer behaviour and sustainability serve as the foundation for understanding the motivations and factors that influence consumers' choices towards more sustainable options (Balderjahn et al., 2023; Čapienė et al., 2022; Hazaea et al., 2022). These theories provide insights into the psychological, social, and economic factors shaping consumer behaviour in relation to sustainability and aid in identifying key intervention points to promote sustainable consumption (Živković & Brdar, 2018).

Rational choice theory assumes that consumers make rational decisions based on maximizing their benefits and minimizing costs (Lahno, 2007; Quackenbush, 2004). When it comes to sustainability, consumers are likely to opt for sustainable choices if they believe it will bring them greater benefits or satisfaction (Meise et al., 2014). For example, a consumer may choose a sustainable product because they believe it is of better quality and more durable than unsustainable alternatives. Social norms theory suggests that consumers often make decisions in line with the norms and values of their social group or community (Gaymard, 2014; Young, 2015). If sustainability becomes an accepted and desirable norm within a specific social group, consumers are likely to choose sustainable options more frequently to fit in and meet their community's expectations (White et al., 2019). Expectancy-value theory emphasizes that consumers make choices based on their perception of expectations and values related to a particular product or service (Shepperd & Taylor, 1999). If consumers believe that sustainable products or services will have more benefits for the environment or for themselves personally, they are likely to be more inclined to choose them compared to unsustainable options (Brach et al., 2017). Sustainable behaviour theory specifically focuses on understanding consumer behaviour in the context of sustainability (Banytė et al., 2020). Sustainable behaviour encompasses various aspects, including recycling, reduced consumption, support for sustainable brands, and other environmentally responsible practices. It explores the motivations, barriers, and strategies consumers use to adopt and maintain sustainable consumption patterns (Vainio et al., 2020). Social influence theory investigates how consumers are influenced by others and society in their consumer choices (Ward, 1978). For instance, social pressure, the influence of friends, family, or media campaigns can impact consumer decisions regarding sustainability. This theory underscores the importance of societal engagement in promoting sustainable values and consumption. The desire for group affiliation and fear of social exclusion can motivate people to adopt sustainable habits, even if they hadn't practiced them previously (Salazar et al., 2013).

Combining these theories helps create a more comprehensive understanding of consumer behaviour regarding sustainability. Different consumers may be motivated by different factors, so it is crucial for marketing strategies and interventions aimed at promoting sustainability to recognize these diverse motives and tailor their approaches accordingly. Simultaneously, societal engagement, education, and raising awareness about the importance of sustainable behaviour are also paramount in effecting positive change and supporting sustainable consumption.

### 2.2. The role of marketing strategies in shaping sustainable consumer habits

The role of marketing strategies in shaping consumer habits, especially in the context of sustainability, is deeply complex and pivotal in understanding how consumers make purchasing decisions and use products or services (Živković & Brdar, 2018). Marketing strategies play a role in shaping consumers' perceptions of products, creating demand for sustainable options, and supporting behaviour change (Hazaea et al., 2022).

Marketing campaigns are often used to educate consumers about environmental issues and solutions. For instance, Patagonia launched the "Don't Buy This Jacket" campaign to emphasize the importance of reducing consumer consumption and extending the lifespan of products. This campaign raised awareness about over-consumption and contributed to promoting sustainable consumer habits (Patagonia We're in business to save our home planet., 2022). Companies that highlight their sustainable practices often attract consumers who support environmentally responsible brands. In that way they enhance brand perception. For example, Unilever launched the "Sustainable Living Plan" to improve its ecological reputation and build loyalty among consumers who identify with sustainable values. This led to increased brand loyalty (Unilever PLC, 2021). Daily, we encounter marketing manipulations, promoting unsustainable consumer choices, aimed at grabbing attention and often conflicting with sustainability. Marketing campaigns often strive to establish deep emotional connections between consumers and products or brands. They use narratives that evoke empathy, happiness, or nostalgia to make consumers develop a sentimental attachment to the product (Živković & Brdar, 2018). This emotional connection often overshadows consumers' environmental awareness, making them less inclined to consider the negative impacts of the product on the environment. To attract environmentally conscious consumers, some companies use "green" labels or eco-friendly tags on their products. These labels imply that the products are environmentally acceptable, even if it may not necessarily be true. Consumers can be misled into choosing unsustainable options, believing they are





making a sustainable choice. This tactic is often referred to as "greenwashing" (Jong et al., 2017). Marketing campaigns often employ tactics that create a sense of urgency among consumers. This includes limited offers, time-limited promotions, and messages suggesting that now is the right time to make a purchase (Kacen et al., 2012). This pressure for quick buying decisions can prompt consumers to make hasty choices and purchase products that may not align with their sustainable values.

### 3. FACTORS INFLUENCING ECO-GUILTY PLEASURE

'Eco-guilty pleasure' represents paradoxical behaviour in which consumers continue to engage in unsustainable consumer habits despite being aware of their negative environmental impact. This paradox involves an awareness of environmental issues while simultaneously practicing unsustainable consumer habits. The factors influencing 'eco-guilty pleasure' constitute a crucial area of research that analyses consumers' contradictory behaviour regarding sustainability.

The cultural context can significantly impact 'eco-guilty pleasure.' In societies where consumerism is deeply ingrained, and where consumer identity is often linked to status, individuals may feel pressure to continue unsustainable consumption patterns, despite being aware of environmental issues (Paolo & Stan, 2014). In the United States, per capita energy consumption is significantly higher compared to many other countries (Maguire, 2023). This factor is partially a result of the cultural emphasis on individualism and a consumer-centric way of life, which can lead to 'eco-guilty pleasure' as consumers retain unsustainable habits. Interaction with friends, family, and social groups can have a strong influence on consumer choices. If the consumer's environment supports unsustainable habits or does not set expectations for sustainable behaviour, 'eco-guilty pleasure' may result from this social pressure (Paolo & Stan, 2014; Salazar et al., 2013). For example, adolescents may feel pressured to purchase fast fashion to conform to social norms, even though they are aware of the negative impacts of this industry on the environment. The price of sustainable products and services is often higher compared to their unsustainable alternatives (Pieters et al., 2022). This can limit access to sustainable options, forcing consumers to choose cheaper but unsustainable alternatives. For instance, organic products often come with higher price tags than conventional ones, which can limit access to sustainable options for budget-conscious consumers.

A lack of education on environmental issues and sustainable alternatives can contribute to 'eco-guilty pleasure.' Consumers who are unaware of the impact of their

choices on the environment and society may uncritically continue unsustainable consumer habits (Paolo & Stan, 2014). Consumers often have different values and priorities in life. For example, some consumers may prioritize economic gain or personal comfort, while others may prioritize environmental preservation (Hu et al., 2016). In some cases, consumers may feel limited in choosing sustainable options due to a lack of alternatives in the market or infrastructure supporting sustainable habits (Sheoran & Kumar, 2020). For example, a lack of bike lanes or public transportation can force people to use private cars, even if they would prefer to reduce their ecological footprint.

#### 3.1. Consumer cognitive patterns maintaining the eco-guilty pleasure paradox

Consumer cognitive patterns play a crucial role in maintaining the 'eco-guilty pleasure' paradox. These patterns develop within the consumer's mind and are often used as mechanisms to justify or rationalize unsustainable choices. Here are several cognitive patterns contributing to this paradox:

- **Cognitive Dissonance:** Cognitive dissonance occurs when an individual experiences internal conflict between their values and actual behaviour (Živković & Brdar, 2018). For example, a consumer who considers themselves environmentally conscious may feel conflicted when purchasing a product with a large ecological footprint. To reduce this dissonance, consumers may justify their choices or suppress awareness of the negative ecological consequences.
- **Procrastination:** Consumers often delay making changes in their consumption habits towards sustainability (Paolo & Stan, 2014). The procrastination of these changes, such as transitioning to more sustainable products or reducing consumption, may stem from a fear of losing comfort or familiarity.
- **Defensive mechanisms and justification:** Consumers may employ defensive mechanisms to rationalize their unsustainable choices. Consumers frequently justify unsustainable choices with arguments like "everyone else does it" or "I have no other choice" (Cutright et al., 2011). This can include minimizing environmental issues, denying the seriousness of the problems, or shifting responsibility onto other factors.
- **Information Overload:** An excessive amount of information about environmental issues and sustainable alternatives can lead to apathy and confusion (Meise et al., 2014; Paolo & Stan, 2014). Consumers may feel overwhelmed by information and give up on attempting to make sustainable choices.



- **Perceived Lack of Impact:** Consumers may perceive their individual contributions to environmental issues as negligible and believe that their choices have no significant impact on global ecological challenges (Grimmer & Miles, 2014). This perception can lead them to exert less effort in making sustainable decisions.
- **Temporal Discounting:** Consumers often prioritize immediate gratification and comfort over long-term ecological goals (Arbuthnott, 2010). Delaying immediate satisfaction for the sake of long-term resource preservation can be challenging for many consumers.

All these cognitive patterns often work together, creating a mental equilibrium that supports the 'eco-guilty pleasure' paradox. Understanding these patterns can help develop strategies to overcome this paradox and encourage consumers to make sustainable choices.

### 3.2. Consumer emotional patterns maintaining the eco-guilty pleasure paradox

The emotional component of sustainable consumption represents a key factor shaping our choices as consumers. It deeply connects our emotions, values, and identity with the products we purchase and the services we use (Živković & Brdar, 2018). This emotional connection can be a driver of sustainable choices but can also pose challenges when facing the 'eco-guilty pleasure' paradox.

When discussing the emotional component of sustainable consumption, it is important to understand how our emotional response to products and brands is formed. The emotional appeal of sustainable products can arise from the sense of satisfaction we get when we know we are contributing to the protection of the planet and society (Wang & Wu, 2016). The feelings of pride and fulfilment that come with sustainable choices can be powerful motivators for many consumers. For example, using products produced without harmful chemicals or buying local products can bring a sense of moral fulfilment and contribution to the greater good. On the other hand, the emotional appeal of unsustainable products often relies on immediate gratification, convenience, and social prestige (Arbuthnott, 2010). Marketing campaigns often play a crucial role in establishing an emotional connection with unsustainable products. By using compelling narratives, appealing to emotions, and creating visual attractions, brands can establish a deep emotional bond with consumers (Alčaković et al., 2019). For example, fast-food advertisements often depict happy families enjoying meals together, creating a sense of connection and happiness associated with that brand. Emotional rewards and feelings of satisfaction play a crucial role in reinforcing unsus-

tainable consumer choices. When consumers make unsustainable choices, such as buying cheap, fast-decaying products or using disposable plastics, they often experience immediate emotional rewards. The feeling of satisfaction comes from the convenience, immediate pleasure, or ease of using these products. These feelings often stem from immediate gratification, comfort, and aesthetic pleasure that certain products or services provide (Phillips & Baumgartner, 2002). This immediate sense of satisfaction can be a powerful motivator for consumers and often outweighs longer-term considerations of environmental and societal implications. In many cases, consumers tend to prioritize their immediate needs and desires, disregarding the long-term effects of their choices. Personal experiences and habits also shape the emotional connection to unsustainable products. If we have become accustomed to certain products or brands throughout our lives, we may develop an emotional attraction to them and feel comfortable using them (Amatulli et al., 2020). In the 'eco-guilty pleasure' paradox, consumers often face a conflict between these emotional components. The guilt and concern about environmental issues may clash with the immediate pleasure or social prestige that comes with unsustainable choices (Amatulli et al., 2020; Paolo & Stan, 2014). This emotional conflict can create internal tension that makes it challenging to make sustainable decisions.

Managing the emotional component of sustainable consumption requires a deep understanding of our own values, emotions, and consumer identity. It involves strengthening the emotional connection to sustainable choices, exploring alternatives that provide satisfaction and comfort, and aligning our social identity with sustainable values. Emotional intelligence and environmental awareness play a crucial role in overcoming the 'eco-guilty pleasure' paradox and making sustainable consumer decisions that align with our values and emotions.

## 4. OVERCOMING THE PARADOX: STRATEGIES TO PROMOTE SUSTAINABLE CHOICES

Overcoming the 'eco-guilty pleasure' paradox requires thoughtful application of various strategies to encourage sustainable choices. Three key strategies that can be implemented to address this paradox. Education and raising awareness about sustainability play a crucial role in empowering consumers to make sustainable choices. Activities such as educational programs, awareness campaigns, and workshops can help consumers better understand the environmental and social consequences of their choices (Kuźniar et al., 2021). Through education, individuals can become more aware of their role in preserving the planet and motivated to take sustainable steps. As the second, promoting sustainable alternatives and innovations is also



key to overcoming the paradox. Brands and companies can develop sustainable products and services that are affordable, practical, and attractive to consumers. Innovations in environmental technologies, recycling, and energy efficiency can transform the market and offer sustainable alternatives that meet consumer needs. An example of this is Tesla, a company that has become synonymous with electric cars. Their Model 3 has become popular due to its sustainable technology and performance (Tillman, 2020). The third strategy - the influence of social media and influencers in promoting sustainable behaviour is becoming increasingly significant (Dekoninck & Schmuck, 2022). Campaigns and actions that promote sustainability through social media can inspire people to change their habits and make sustainable choices (Perrault & Clark, 2018). When influencers endorse sustainable brands and products, it can further encourage consumers to turn to sustainable alternatives. Combining these strategies can create a positive framework for overcoming the 'eco-guilty pleasure' paradox and enable consumers to engage in sustainable behaviour without internal conflicts.

## 5. CONCLUSION

The 'eco-guilty pleasure' paradox represents a complex challenge in contemporary society, where consumers often grapple with an internal conflict between their awareness of environmental issues and unsustainable consumption habits. It's important to recognize that no one is perfectly environmentally responsible, but every step towards reducing our negative impact on the environment is significant. By gradually adopting more sustainable lifestyles and supporting initiatives that promote environmental responsibility, we can hope to reduce this contradiction between our "eco-guilty pleasures" and our environmental values over time. Further research is also essential. A deeper understanding of the emotional and psychological aspects of this paradox can aid in developing more effective strategies for promoting sustainability. Additionally, researching the cognitive, social, and cultural factors that shape consumer habits can provide valuable insights into different contexts and communities. In summary, overcoming the 'eco-guilty pleasure' paradox requires a multidisciplinary approach that encompasses education, innovation, and social influence. Only through a combination of these factors can we create an environment in which consumers make sustainable choices with satisfaction and without internal conflict, thereby achieving a positive impact on the planet and society.

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# GREEN POWER OF INFLUENCERS: SHAPING SUSTAINABLE CONSUMER BEHAVIOUR IN THE TOURISM INDUSTRY

Ivana Brdar\*

Singidunum University,  
Belgrade, Serbia

## Abstract:

In the era of widespread social media use, travel influencers have become immensely popular, serving as a significant source of inspiration for travellers globally. This paper aims to examine how travel influencers not only stimulate travel but also influence tourists' behaviour, particularly in the context of sustainability. The goal is to understand the extent to which these influencers shape tourists' preferences for sustainable travel, encompassing choices related to eco-friendly destinations, responsible itinerary planning, environmentally conscious lodging selections, and sustainable activity preferences. Furthermore, this paper scrutinizes the perceived credibility and trustworthiness of travel influencers among tourists and explores their potential role in shaping eco-conscious attitudes. By gaining a comprehensive understanding of how travel influencers impact tourists' sustainable behaviour, industry stakeholders can devise more effective marketing strategies and cultivate collaborations that cater to the distinctive preferences and concerns of this target audience within the tourism sector.

## Keywords:

travel influencers, consumer behaviour, sustainability, tourism industry, travel decisions.

## 1. INTRODUCTION

The rapid rise and widespread adoption of social media platforms have brought about a transformative impact on various facets of our lives. This digital evolution has been extended to the tourism industry, fundamentally altering the way travellers consume information, make decisions, and connect with destinations (Chamboko-Mpotaringa & Tichaawa, 2023; Hermanto et al., 2023; Mude & Undale, 2023; Wu et al., 2023). Within this context, sustainability has become an increasingly vital consideration. The tourism industry has witnessed a substantial transformation due to social media's influence. These digital platforms now serve as influential tools, significantly shaping travellers' journey planning and experiences (Živković et al., 2014; Živković et al., 2016; Wei et al., 2023). Social media channels have become integral parts of travellers' lives, playing roles as virtual travel guides, sources of inspiration, and platforms for sharing travel experiences (Nasution et al., 2023). The visual appeal of social media, coupled with its capacity to connect people, has created an immersive and interactive environment for travellers and industry stakeholders alike. Of particular relevance to sustainability, social media has democratized information access in the tourism sphere (Schönherr et al., 2023). Travellers can now readily access a wealth of information, including destination recommendations, eco-friendly travel tips, and user-generated reviews (Blaer et al., 2020; Nasution et al., 2023). Real-time updates on sustainable travel trends, events, and news empower tourists to make environmentally conscious choices during their trip planning. Furthermore, this information about democratization empowers tourists to share their sustainable travel experiences, contributing to a collective knowledge base (Arica et al., 2022).

Correspondence:  
Ivana Brdar

e-mail:  
ibrdar@singidunum.ac.rs





Within this evolving landscape, travel influencers have emerged as instrumental figures, wielding significant influence over tourists' behaviour. They leverage their recommendations, visually appealing content, and engaging narratives to sway travellers' decisions not only in terms of destination selection but also in choosing eco-friendly accommodations, sustainable dining options, and eco-conscious exploration. In response to this influence, destinations and tourism businesses are increasingly partnering with influencers to enhance their sustainability-focused promotional efforts (Bican & Brem, 2020). However, it is essential for influencers to bear the responsibility of delivering high-quality and genuine content to instil trust and establish themselves as reliable sources of sustainability-related travel information (Ramos-Soler et al., 2019). The aim of this paper is to assess how these influencers affect tourists' sustainable travel choices and examine their credibility among tourists, with a focus on their role in shaping eco-conscious attitudes. The expected outcome is a better understanding of how travel influencers impact tourists' sustainable behaviour, leading to more effective marketing strategies and collaborations within the tourism sector.

## 2. LITERATURE REVIEW

### 2.1. From Clicks to Check-Ins: The role of the Internet and social media in modern tourism marketing

The Internet marketing, also referred to as online marketing, harnesses digital platforms and methodologies to promote brands while targeting specific market segments. It's essential to recognize that the Internet marketing isn't the sole method for generating interest and awareness about a product. Its primary aim is to channel traffic to the advertiser's website through diverse means (Alčaković et al., 2021). One of the foremost advantages of the Internet marketing is its potential to reach a vastly larger audience compared to traditional methods, thanks to the global reach of the Internet (Jović, 1999; Liu et al., 2013). Additionally, this marketing approach empowers organizations to focus on potential customers who are inclined towards sustainable consumer behaviour (Kurdi et al., 2022). Several online methods, including email marketing, social media marketing, text messaging, banner ads, and affiliate marketing, provide organizations with opportunities to engage consumers with sustainability in mind (Gvaramadze, 2022; Živković & Brdar, 2018). The Internet serves as a conduit for businesses to advertise, communicate with customers, and facilitate sustainable consumer behaviour (Brdar, 2023). A well-executed Internet strategy can profoundly impact the effectiveness of sustainability-focused marketing and product sales. The significance of the Internet marketing for sustainable business success arises from

the heavy reliance on the Internet by both businesses and customers, making it crucial for businesses to implement structured Internet marketing practices (Mathews et al., 2016; Živković & Brdar, 2018).

In the context of sustainability, social media plays a pivotal role in shaping consumer behaviour within the tourism domain (Cheng & Edwards, 2015; Pearson et al., 2016). It influences sustainable travel inspiration, the creation of authentic eco-friendly experiences, online booking with sustainability in mind, and the impact of influencers on sustainable travellers. Social networks also facilitate the sharing of sustainable travel experiences and reviews and enable destination management through sustainable engagement and interaction. This underscores the profound influence of social media on sustainability-conscious consumer behaviour in the tourism sector, emphasizing the need for destinations and tourism entities to adapt to evolving sustainability dynamics (Gaffar et al., 2020; Hadianfar, 2021; Shen et al., 2020).

### 2.2. Influencers in the Spotlight: Understanding Their Role in Modern Marketing

In today's digital age, influencers have become a dominant force in the realms of marketing, entertainment, and social influence. An influencer, broadly defined, is an individual who possesses the ability to sway the opinions, behaviour, and decisions of a substantial number of followers, often through various online platforms such as social media, blogs, or video content (Jin et al., 2019; Kim & Kim, 2022). The rise of influencers can be attributed to the evolving landscape of media consumption. Traditional advertising channels are no longer as effective as they once were (Hanekom & Scriven, 2002). Consumers are increasingly turning to social media and digital content for information, entertainment, and product recommendations (Umashankar et al., 2023). In this context, influencers offer a unique bridge between brands and consumers. Influencers come in various forms, each catering to specific niches and demographics. What sets them apart is their authenticity and relatability. Their followers often perceive them as trustworthy figures, as their recommendations and endorsements feel more genuine than traditional advertisements. Here are several classic categories of influencers:

- **Lifestyle Influencers:** These influencers share their everyday life experiences, including travel, fashion, food, family life, and more. Their audience follows them for inspiration and advice on improving their lifestyle (Gerrath & Usrey, 2020).
- **Beauty and Makeup Influencers:** These influencers are experts in makeup, skincare, and beauty. They provide tutorials, product reviews and tips for achieving specific looks (Sokolova & Kefi, 2020).



- **Fashion Influencers:** Fashion influencers focus on style and clothing. They promote clothing brands, create fashion combinations and inspire their audience with their outfit choices (Quelhas-Brito et al., 2020).
- **Travel Influencers:** These influencers explore the world and share their travel adventures. They inspire their followers to explore new destinations, provide travel tips, and share beautiful photos and video content (Asdecker, 2022).
- **Fitness Influencers:** Fitness influencers promote a healthy lifestyle, exercise, and nutrition. They share workouts, recipes, and motivate their audience to take care of their physical health (Durau et al., 2022).
- **Food Influencers:** Food influencers are experts in food and culinary arts. They share recipes, restaurant recommendations, and photos of delicious dishes (Robinson & Field, 2015).
- **Gaming Influencers:** These influencers engage in video gaming and stream their gaming sessions. They attract an audience that shares a passion for gaming (Kim & Han, 2009).
- **Tech Influencers:** Tech influencers follow the latest technological trends, devices, and software. They provide reviews and advice on tech products (Trivedi & Sama, 2020).
- **Environmental Influencers:** Environmental influencers are dedicated to promoting sustainable practices, recycling, waste reduction, and everything related to protecting the planet (Dekoninck & Schmuck, 2023).

The power of influencers lies in their ability to create engaging and relatable content. They use their personal experiences, stories, and expertise to connect with their audience. Whether it's sharing their daily routines, providing product reviews, or documenting their travels, influencers offer a glimpse into their lives that resonates with their followers (Asdecker, 2022). For brands and businesses, influencers provide a direct channel to their target audience. Instead of broadcasting messages to a broad and often disinterested audience, they can collaborate with influencers who have already cultivated loyal and engaged followers within the desired demographic. This targeted approach yields higher engagement rates and a more significant return on investment (Jin et al., 2019).

### 3. SUSTAINABILITY SHAPERS: THE GREEN INFLUENCE OF TOURISM INDUSTRY INFLUENCERS

Travel influencers hold substantial influence over consumer behaviour in the tourism context, and their role is closely intertwined with sustainability considerations. In the digital age, social networks have been transformed into hubs of sustainable information and inspiration. Influencers have emerged as pivotal figures, engaging their target audience in ways that directly impact their sustainable travel preferences (Abou-Shouk & Hewedi, 2016; Seeler et al., 2019). Travel influencers primarily wield their influence through travel inspiration, crafting a compelling mix of visuals, videos, and narratives that showcase various adventures and sustainable experiences. They ignite a strong desire for sustainable travel by presenting viewers with transformative and eco-conscious journeys, aligning with the growing trend of sustainability (Kilipiri et al., 2023; Palazzo et al., 2021; Reyes-Menendez et al., 2020). Additionally, travel influencers play a pivotal role in shaping genuine and immersive sustainable experiences for modern-day tourists (Agyeiwaah et al., 2021; Xiang & Gretzel, 2010). In response to changing preferences, travellers increasingly seek to immerse themselves in local culture, explore lesser-known places, and embrace sustainability. Influencers facilitate this trend by connecting travellers with local communities, revealing authentic and sustainable experiences beyond traditional tourist routes (Reyes-Menendez et al., 2020). Their digital narratives and storytelling techniques resonate strongly with eco-conscious travellers, guiding them towards sustainable exploration (Shen et al., 2020). Furthermore, travel influencers significantly influence travellers' sustainable choices regarding accommodation, dining venues, and activities during their trips (Lee et al., 2021). Their endorsements and reviews hold substantial weight in the decision-making process, acting as valuable social proof of the sustainability and authenticity of destinations and service providers. This influence is particularly potent among discerning travellers who actively seek reliable information and authentic sustainable experiences (Kilipiri et al., 2023; Latif et al., 2020). Furthermore, influencer-driven promotions contribute to the long-term perception of a destination. Positive portrayals and reviews foster a favourable image, sustaining interest over time and solidifying the destination's reputation as an attractive and sustainable place for travellers (Jun & Yi, 2020). Beyond traditional advertising, influencers inject authenticity and enthusiasm into their content, building trust and credibility among their audience (Lee et al., 2021).



Influencers can significantly impact sustainable tourist behaviour in several ways:

- **Inspiration for Sustainable Travel:** Influencers often promote destinations and experiences that are environmentally friendly and responsible. Through their content, they can inspire their followers to consider sustainable travel options, such as eco-tourism, visiting national parks, or staying in environmentally certified accommodations (Sultan et al., 2021).
- **Education on Sustainability:** Influencers can act as educators on sustainability by providing information about environmental challenges in specific destinations, offering guidance on proper behaviour towards nature and culture, and raising awareness about environmental conservation (Caldevilla-Domínguez et al., 2021).
- **Recommendations for Sustainable Choices:** Through their recommendations and reviews, influencers can steer tourists toward sustainable options, including eco-friendly tours, locally sourced food, and other activities that support local communities and the natural environment (Kilipiri et al., 2023).
- **Promotion of Waste Reduction and Recycling:** Influencers can encourage tourists to practice waste reduction and recycling during their travels, contributing to the preservation of nature and reducing the negative impact of tourism on the environment (Cao et al., 2023).
- **Advocating Responsible Animal Interaction:** Influencers can inform tourists about ethical animal interactions during their travels, promoting visits to reserves and conservation centres instead of activities that involve the exploitation of wildlife (Zhang et al., 2023).
- **Engagement with Local Culture and Communities:** Influencers often explore local culture and support local communities. Through their content, they can encourage tourists to engage in sustainable tourism activities that benefit the local population (Kilipiri et al., 2023).
- **Encouragement of Low Environmental Impact Travel:** Influencers can promote ways of travel that reduce the ecological footprint, such as using public transportation instead of private vehicles or staying in accommodations that practise environmentally sustainable measures (Cao et al., 2023).

## 4. CONCLUSION

The influence of travel influencers on consumer behaviour within the tourism context is not only significant but also holds a direct connection to sustainability considerations. Through inspiring content, authentic sustainability recommendations, and direct engagement with their dedicated audience, influencers exert a profound and widespread impact on traveller preferences. Simultaneously, they cultivate a propensity for exploring sustainable destinations and participating in eco-conscious experiences. Travel influencers play a vital role in promoting sustainable tourism by showcasing eco-friendly destinations, responsible travel practices, and sustainable experiences. Their ability to narrate authentic sustainability stories resonates deeply with sustainability-conscious travellers, encouraging them to make responsible choices during their journeys. In an era where sustainability is a growing concern, influencers have the potential to drive travellers towards more sustainable and responsible travel decisions, ultimately contributing to the conservation of natural and cultural resources. Furthermore, their role as advocates for sustainable tourism brands and destinations amplifies this influence. As the digital landscape continues to evolve, partnerships with travel influencers become increasingly essential for tourism enterprises seeking to gain a competitive edge and attract discerning and sustainability-minded travellers. This area offers significant potential for further research, providing an opportunity to gain a deeper understanding of the intricate mechanisms underpinning the influence of travel influencers and their pivotal role in shaping patterns of sustainable tourism consumption and the industry. Understanding how influencers can effectively promote sustainability in tourism is crucial for the industry's long-term viability and positive impact on the environment and local communities.

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# THE ODYSSEY OF STRATEGIC INVESTING IN ARTIFICIAL INTELLIGENCE (AI) STARTUPS

Miloš Petković<sup>1\*</sup>,  
Enkjhin Jambal<sup>2</sup>,  
Juan Camilo Bolivar Mesa<sup>2</sup>,  
Farshid Emdadi<sup>2</sup>

<sup>1</sup>Singidunum University,  
Belgrade, Serbia

<sup>2</sup>Berlin School of Business  
and Innovation,  
Berlin, Germany

## Abstract:

This paper investigates the dynamics and challenges faced by strategic investors in the context of Artificial Intelligence (AI) startups. As the landscape of financial markets evolves, strategic investments in AI startups have gained considerable attention due to their potential for disruptive innovation and substantial returns. However, the unique characteristics of AI ventures pose distinctive challenges to investors, necessitating a comprehensive understanding of the underlying factors that shape the investment landscape. Drawing on literature review analysis, this research explores the strategic decision-making processes, investment strategies, and performance outcomes of strategic investors in the AI startup ecosystem. The study uncovers the key determinants that influence the success or failure of strategic investments in AI startups, including the evaluation of technological capabilities, market potential, business models, and strategic alignments. The findings provide valuable insights for both investors and entrepreneurs, offering guidance on effective strategies for navigating the complex landscape of AI investments. By shedding light on the odyssey of strategic investing in AI startups, this research contributes to the existing literature and informs stakeholders on maximizing the benefits and mitigating the risks associated with investments in this rapidly evolving domain.

## Keywords:

corporate strategy, investments, startups, artificial intelligence.

## 1. INTRODUCTION

In the rapidly evolving landscape of modern technology, artificial intelligence (AI) stands as one of the most transformative forces, reshaping industries, and societies at an unprecedented pace. The ever-growing potential of AI to revolutionize businesses has led to a meteoric rise in AI startups, representing the vanguard of innovation in this domain. The entrepreneurial endeavors embarked upon by these AI startups, however, are far from a smooth and unerring journey. Rather, their odyssey of strategic investing is laden with challenges and opportunities that dictate their fate in the fiercely competitive market.

"The Odyssey of Strategic Investing in AI Startups" delves into the enthralling narrative of these pioneering ventures, shedding light on the intricacies of their journey, the risks they encounter, and the strategic decisions they make in pursuit of success. As the dawn of the fourth industrial revolution breaks, the allure of AI startups has garnered immense interest from investors, venture capitalists, and policymakers, alike. This research paper seeks to provide a comprehensive understanding of the dynamics that underpin the investment landscape in AI startups, exploring the factors that shape their strategic choices and eventually impact their growth and survival.

Correspondence:  
Miloš Petković

e-mail:  
mpetkovic@singidunum.ac.rs



The pivotal role of AI startups in shaping the technological trajectory of the world has captured the imagination of stakeholders across various sectors. Investors, eager to capitalize on the transformative potential of AI, are navigating through uncharted waters, seeking opportunities that yield substantial returns while mitigating inherent risks. As the AI startup ecosystem continues to mature, it becomes evident that merely riding the wave of innovation is inadequate for sustainable success. Discerning investors must adopt a strategic approach that aligns with the unique challenges and distinct characteristics of AI startups, acknowledging the intricate interplay between technology, market dynamics, and regulatory landscapes (Petković & Cao, 2021).

By delving into case studies and analyzing market trends, this research paper uncovers the diverse strategies employed by AI startups to secure funding, build partnerships, and expand their market presence. We examine the critical role of visionary leadership, the importance of nurturing innovation, and the art of identifying promising startups amidst a sea of competitors. Moreover, we explore the impact of evolving ethical considerations, data privacy concerns, and regulatory frameworks on the investment decisions surrounding AI startups, emphasizing the growing need for responsible investing in this transformative domain.

The journey of strategic investing in AI startups is akin to an epic voyage, fraught with perils and laden with unexplored opportunities. As we navigate the course of this research paper, we invite readers to embark on an intellectual odyssey that unravels the mysteries surrounding the world of AI startups. By comprehending the nuances of strategic investing in this domain, stakeholders can equip themselves with the knowledge needed to make informed decisions, navigating the turbulent seas of the AI startup landscape with astuteness and foresight (Petković & Del Real Ramirez, 2020). Together, we venture forth into uncharted territory, driven by the collective pursuit of unraveling the enigma of AI startup success in an ever-changing world.

## 2. EVALUATING NEW BUSINESS OPPORTUNITIES IN AI INDUSTRY

In today's rapidly advancing technological landscape, the AI industry has emerged as a hotbed of innovation and transformation, presenting entrepreneurs and businesses with unprecedented new opportunities. As AI continues to permeate various sectors, from healthcare and finance to manufacturing and retail, it has sparked a wave of excitement and curiosity, with the potential to reshape the way we live and work. The convergence of big data, powerful algorithms, and computing capabilities

has unlocked a realm of possibilities, paving the way for groundbreaking ventures that harness the untapped potential of AI.

Certain players have chosen to reinforce the momentum that AI has had in areas of considerable profit such as data analysis, hyper-automation of processes, supply chain optimization, among others. However, the AI opportunities that will really have an impact on society and will represent the business opportunities that will be on everyone's lips, is not based on the 4.0 industry created in the twentieth century, but in the 5.0 society belonging to the twenty-first century.

The speed with which technology has advanced in recent decades has not been the same as the speed with which humanity has been able to adapt and cope with all these novelties. As a result of this disparity of capabilities, humans have perceived two sides of technological dynamism. On one hand, daily life has become easier, connectivity and even treatments and disease prognoses have evolved in a way that could not have been conceived a few years ago. On the other side of the coin, there is an unanticipated scenario. Increasing emotional disorders, hoarding of energy and natural resources, as well as vulnerability in the privacy of each person, are just some of the circumstances that distress humanity.

It is from there, that the 5.0 society separates the vision focused on the industry with which the discoveries have been developed since the industrial revolution and shifts that interest to an understanding where the human being is the center of technological advancement and innovation (Pereira et al., 2020). On this change of spectrum, the business opportunities related to AI will be all those that seek to produce happiness, satisfaction, make people feel fulfilled and seek to improve the quality of life (Pereira et al., 2020).

The quest to strengthen aspects of the population's lifestyle will start in the health area where the main protagonists will be the mental health assistants - which will be the ones who can provide support and guidance to individuals struggling with stress, anxiety or depression — along with the emotional intelligence enhancers — AI tools can analyze language patterns and emotional cues in conversations to provide feedback on improving emotional intelligence. At the same time, to promote work-life balance, AI will begin to embrace niches of art and rehabilitation music where AI-generated art and music can be used in therapeutic settings to promote relaxation, creativity, and emotional expression.

It is correct to acknowledge a path has been traced throughout this paper on the niches suitable for exploiting AI and securing a position in the industry of the future. However, it is important to emphasize that the products resulting from these efforts will not have the same strength and impact in all regions - regardless of their level of development.





Actors interested in being part of the emerging business opportunities within the 5.0 society will have to consider the current reluctant position of various actors towards the free movement of AI.

It is well known that AI relies heavily on gigantic amounts of information — the product of big data — to feed its learning mechanisms and thus have a better performance and accuracy within the tasks assigned to it. This capability is hindered by the various regulations that are being applied around the world. The amount of information that big data can collect is being limited across the European Union and the United States through practices like pseudonymization. Since this technology seeks to collect vast amounts of information from any available and untargated resource, the use of it under conditions with human-created biases, accessibility restrictions or masking of information would harm its output, affecting precision and accuracy (Zarsky, 2017).

Considering this type of delay in the maturity level of AI, the race to gain a competitive advantage in the business that is the responsibility of this type of technology will be divided into distinct categories of actors. On the one hand, those players who will focus their efforts on adapting innovations to a myriad of regulations will grow exponentially. On the other hand, there will be places where the limits of AI can be explored without any ties, such as China, where they are motivated to challenge the capabilities of innovative technologies. Finally, some actors will accelerate the next level of AI where with few inputs complex training can be generated with high accuracy and outstanding performance, approaching mimicry with the human brain.

### 3. FINANCING NEW AI VENTURES

As the world embraces the transformative potential of AI, it becomes evident that AI-powered ventures are leading the charge in technological innovation. However, funding such ventures presents unique challenges due to the substantial investments required for AI technology development and talent acquisition (Kelnar, 2019). In this comprehensive exploration of financing options for AI startups, we aim to shed light on the current AI startup financing landscape, examining both the most and least utilized approaches in the industry.

The growth of AI investment has witnessed an exponential rise in AI startups globally. According to the Artificial Intelligence Index Report (2019), the global private AI investment in 2019 surpassed an impressive \$70 billion. This included over \$37 billion in AI-related startup investments, \$34 billion in M&A transactions, \$5 billion in IPOs, and Minority Stake valued at approximately \$2 billion. Between 2014 and 2019 (until November 4<sup>th</sup>), a total of 15,798 investments were made in AI startups, with

an average investment of approximately \$8.6 million per venture. Over the years, global investment in AI companies surged from \$1.3 billion in 2010 to a staggering \$40.5 billion in 2018, displaying an impressive average annual growth rate of 48% (Brynjolfsson et al., 2019).

Notably, starting in 2015, AI startups have been able to raise more capital than traditional software companies, indicating the increasing attractiveness of the AI sector to investors (Brynjolfsson et al., 2019). These figures demonstrate the robust growth and significance of AI investment, underscoring its potential impact across industries.

Geographically, the United States continues to dominate the AI startup landscape, leading in the number of funded startups and consistently securing significant AI funding. On the other hand, the European start-up ecosystem is steadily maturing, with one in six European AI companies classified as 'growth' - stage companies with funding exceeding \$8 million (Brynjolfsson et al., 2019). This trend underscores the growing momentum and potential of the European AI market.

In the case of the AI startup financing options, it is like other new ventures, such as bank loans, government funding, venture capitalists, crowdfunding, and individual investors. However, our literature research indicates that due to the unique nature of AI startups, some traditional funding sources may not be as popular, while certain options are more prevalent than those typically seen in other software or hi-tech companies.

Venture capital and business angel financing have been widely acknowledged as crucial funding sources for young and innovative firms (Block et al., 2018). These financing avenues also play a significant role in fueling growth and innovation in AI startups, as highlighted by Kelnar (2019) who identifies them as the most popular types of investors in the AI industry. A compelling example of this phenomenon is observed in Generative AI, which, despite being a fraction of the total investments in AI, has experienced remarkable growth. Just in the first five months of 2023, generative AI secured an impressive \$12 billion in funding. This substantial growth is a result of the support from venture capital and other private external investors, as demonstrated by an average compound growth rate of 74 percent annually between 2017 and 2022 (Micheal et al., 2023).

Furthermore, various literature suggested that government investors show a greater inclination towards investing in AI startups compared to software startups (Vermeer, 2019). For instance, the work of Lagendijk et al. (2018) highlights the Dutch government's prioritization of investing in AI companies. Particularly, the Dutch Government took an initiative-taking step in 2019 by introducing the Strategic Action Plan AI (SAPAI), which emphasizes investment in AI. As part of this forward-





thinking initiative, the government collaborated with sixty-five companies to explore AI opportunities (Vermeer, 2019). These efforts demonstrate the government's recognition of the significant role AI plays in driving innovation and economic growth. Moreover, government support for startups extends beyond financial investment. Initiatives such as creating tax exemptions for startups, providing interest-free loans, and implementing accelerator and incubator programs are part of the broader ecosystem-building approach (Kshetri, 2018). These measures not only ease the process of starting a new company but also foster a supportive environment for startups to thrive and innovate. By providing financial, regulatory, and ecosystem-building support, governments can significantly benefit many startups, including those in the AI domain.

On top of the significant investors for AI ventures mentioned earlier, there is another emerging option for funding AI startups. Large incumbents such as Intel, Google, or Johnson & Johnson are adopting a unique approach by taking a minority stake in innovative young firms instead of acquiring them and integrating them into their own organizations. These startups remain independent, and with the support of these incumbents, they can further develop their promising technologies and explore new markets (Block et al., 2018). More favorably, companies like Google, Amazon, IBM, and Microsoft (GAIM) play a pivotal role in the AI ecosystem. They provide the platform, AI infrastructure, development environments, and 'plug-and-play' AI services that are widely used by developers and consumers of AI (Kelnar, 2019). Positioned as powerful platforms supporting the provision of AI, these companies have the potential to accrue substantial value and drive innovation in the AI industry. Their contributions help create a thriving ecosystem for AI startups and foster innovation in the AI domain.

On the contrary, bootstrapping, crowdfunding, and bank loans are the least used financing options for AI ventures. Typically, bootstrapping emerges as a suitable approach for businesses that do not require excessive funding in the initial stages. Nevertheless, AI-powered companies often demand considerable investments, making traditional Friends, Family, and Fools (FFF) funding less prevalent in this domain (Warzyńska, 2020). Moreover, crowdfunding is seldom employed as a financing method for high-tech companies, especially those harnessing advanced technologies like AI (Corea, 2017). Additionally, traditional bank loans and other debt are not commonly favored for financing new or growing ventures (Leach & Melicher, 2021).

Overall, the soaring investments in AI ventures signify immense confidence in the transformative potential of AI technologies and their significant impact on various industries worldwide. By understanding the financing landscape and tapping into the support from various

stakeholders, AI startups can continue to thrive and drive innovation in the fast-paced and ever-evolving world of AI entrepreneurship.

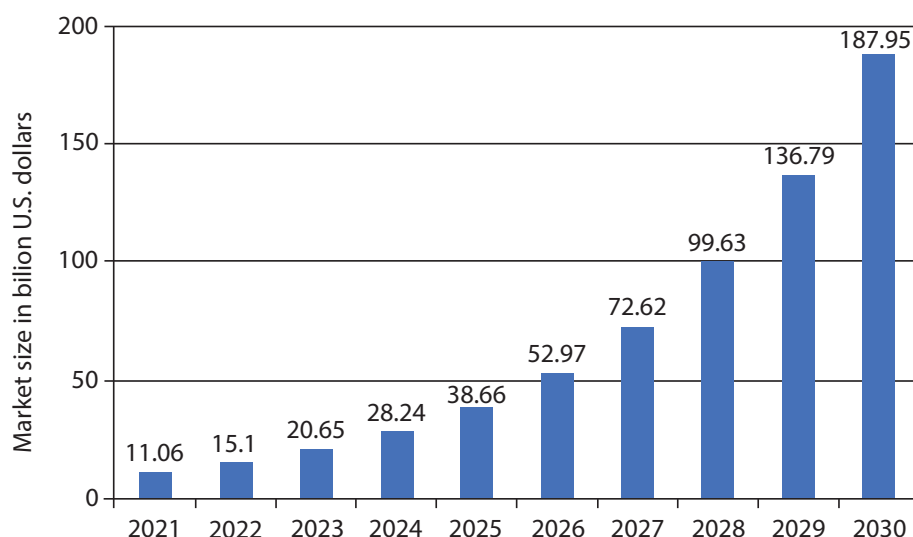
#### 4. STRATEGIC FINANCIAL PROJECTIONS AND EXIT STRATEGY

Competing in fast markets based on AI, from self-autonomous vehicles to ChatGPT, requires the growth of companies in this field in accordance with the growth of this phenomenon in various dimensions. To understand how fast such a market is, it is enough to know that the mentioned market is anticipated to experience an expansion at a CAGR (compound annual growth rate) of 35.6% from 2023 to 2030, where AI's market size will reach USD 109.37 billion (GRAND VIEW RESEARCH, 2023). According to Figure 1, even if a company relying on AI in healthcare earns 1 billion dollars in 2023 (approximately 4.8% of the total revenue) and cannot follow the predicted 16 percent growth in 2030 and keep more or less its current income, in the target year, will only contribute half a percent of the total revenue, which practically indicates a significant decrease in its market share.

That is why startups should have an ambidextrous approach, according to White and Bruton (2017), in markets based on AI, in a way that exploiting efficiently their current resources while exploring future resources for planned growth. Planned growth could be in the format of a product development process where companies have determined strategies to follow or surpass the AI market demands through new product platforms, derivatives of existing product platforms, Incremental improvements to existing products, and/or fundamentally new products (Ulrich et al. 2020). Based on such a growth plan, AI startups predict the future cash flow and required financial resources comprising startup, first, second, -round, mezzanine, and liquidity-stage financing (Leach and Melicher, 2018a). A bitter consequence is that every new round of financing needs issuing new shares which will be extracted from AI startup owners' shares. This process leads to owners' control dilution. On the other hand, such agile businesses are likely to score high on the Classification Guidelines for Completing the VOS Indicator™, according to Leach and Melicher (2018b), one of which is IPO potential <2 years. The above concepts warn entrepreneurs that they should also determine exit strategies from the very beginning of their business design. The good news is that this exit does not mean the end, but rather a new beginning. However, the exit strategy can be chosen among the options comprising systematic liquidation, outright sale, or going public depending on the conditions and owners' preferences.



**Figure 1.** Artificial intelligence (AI) in healthcare market size worldwide from 2021 to 2023.



Source: Statista.com/statistics/1334826/ai-in-healthcare-market-size-worldwide

According to Petty et al. (1999), willing and able buyers may come and go quickly, and the markets for initial public offerings often move quickly between being “hot” or “cold.” For example, the intermediaries of investment banks have several options that they must prioritize investment options through due diligence to persuade investors to invest. Therefore, business owners should always be ready for the opportunities available in the harvesting stage by providing the projected financial statement based on the desired growth. An important aspect in this context is calculating the future venture worth based on the desired growth and not the history of the company because what investors are looking for is to know whether the return on their desired investment will be provided based on the projected growth. Such estimates will be possible through one of the methods comprising discounted cash flow, venture capital valuation, and so forth.

## 5. CONCLUSION

The paper has traversed the captivating landscape of AI entrepreneurship, exploring the challenges and triumphs faced by startups in their quest for success. Our journey through this research paper has revealed that the world of AI startups is not a mere reflection of conventional investment paradigms; it is an enigmatic realm where bold visionaries and pragmatic strategists navigate the uncharted waters of technological disruption and market volatility.

Throughout this exploration, we have witnessed the pivotal role of strategic decision-making in shaping the trajectory of AI startups. From securing initial funding to building strong partnerships and scaling operations, every step taken by these innovative ventures is laced with profound implications for their future. We have observed

that strategic investing in AI startups requires a delicate balance between risk-taking and prudence, as well as an unwavering commitment to fostering innovation.

The success stories of some AI startups inspire awe and optimism, while the cautionary tales of others offer valuable lessons. Visionary leaders armed with deep industry insights and a commitment to ethical practices have emerged as driving forces behind transformative startups. These leaders recognize that the journey to success is not a solo endeavor but a collaborative effort that involves engaging stakeholders from diverse backgrounds, including researchers, developers, investors, and policymakers.

In our quest to understand the strategic investment landscape, we have uncovered the significance of responsible investing in AI startups. As this domain becomes increasingly intertwined with sensitive ethical and regulatory considerations, investors must prioritize sustainable growth over short-term gains. By prioritizing ethical AI practices, data privacy, and social impact, investors can create an environment that fosters innovation and earns the trust of the public, fortifying the longevity of AI startups.

Moreover, this research paper has highlighted the profound impact of market dynamics on strategic investing in AI startups. In a rapidly evolving landscape, where technological advancements unfold at breakneck speed, investors must remain agile and adaptable. The ability to discern opportunities, pivot when necessary, and capitalize on market shifts is critical in determining the survival and prosperity of AI startups.

As we conclude this odyssey, we must acknowledge that the journey of strategic investing in AI startups is far from over. It is an ongoing expedition that requires continuous learning, evolution, and a willingness to embrace change. The symbiotic relationship between investors and



startups will continue to shape the future of AI and define the boundaries of human innovation. To prospective investors, policymakers, and industry stakeholders, we offer the wisdom gained from this research paper: approach the world of AI startups with a curious mind, a strategic vision, and an unwavering commitment to ethical and responsible practices. Embrace the uncertainty of the voyage, for it is in the uncharted waters that the most transformative discoveries are made.

In closing, "The Odyssey of Strategic Investing in AI Startups" seeks not only to enlighten but also to inspire. May this exploration serve as a guiding beacon for those venturing into the dynamic realm of AI entrepreneurship, steering them towards making informed decisions and shaping a future where technology and humanity harmoniously coexist, propelling us ever forward into a world of endless possibilities.

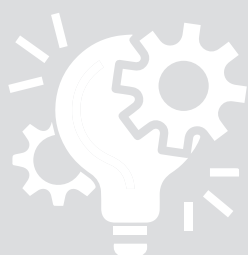
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## PROJECT RESEARCH ARTICLES



## PROJECT RESEARCH ARTICLES

There are three papers that present the research in the fields of Corporate Governance (2) and Circular Economy (1).

The first paper in the field of corporate governance presents the results of CA19130 - Fintech and Artificial Intelligence in Finance - Towards a transparent financial industry (FinAI). Digital technologies are vastly used in the financial sector which also tends to be the greatest driver in the digital transformation of the economy. The aim of Financial technology (FinTech) is to compete with and support the established financial industry in the delivery of financial services. The objectives of this projects are to improve transparency of AI supported processes in the Fintech space, to address the incongruence between the proliferation in AI models within the financial industry for risk assessment and decision-making, and to develop methods to examine the superiority of products across the asset management, banking and insurance industries.

The first paper intends to examine the impact of the German Supply Chain Due Diligence Act on Serbian companies that are potentially part of the supply chain of German companies. The aim of the research is to investigate whether Serbian companies are ready for the usage of the German Act. The sample included 46 companies that are members of the German-Serbian Chamber of Commerce (AHK) in 7 relevant industries: automotive parts production, logistics and transport, construction, metal and metal processing, agriculture and food, textile and clothing, and chemical. The source of the information is data published on the sites of those companies for the period 2020-2022. Research results show that Serbian companies are mostly aware of the need to align with international standards regulating human rights and environmental protection. The results indicate that certain companies stand out in this regard and those are the following: Brose, Continental Automotive, Leoni Wiring Systems Southeast, Holleman transport, Nelt Co, Xella Serbia, Knauf Insulation, GEZE, Delta Agrar, Henkel Serbia, and Elixir Group.

The second paper in the field of corporate governance features an interdisciplinary study resulting from the aforementioned CA19130 project and from ORCA-LAB project (All-Optical Reservoir Computer Architecture based on Laser Bistability).

The ORCA-LAB project examines the ways in which novel all-Optical Reservoir Computer Architectures (ORCAs) that rely on the force of the innovative adaptive nonlinear nodes (NNodes), could be implemented in a demanding financial forecasting environment, as one of many possible applications. As a superb type of recurrent neural networks (RNNs), reservoir computers (RCs) are exceptionally powerful in temporal classification, regression and Big-Data prediction, while, due to training effortlessness, they demonstrate superior performance in comparison with other RNNs and AI architectures and models. The project objectives include the stimulation of progressive all-optical delayed-feedback RC architectures based on novel adaptive nonlinear node, the testing of hardware implementation of DF-RC based on adaptive nonlinear node and the application of RC in a case-study of financial market time-series prediction.

The second paper notes that many studies aim to apply machine learning in stock price prediction as one of the challenging trends in fintech. Fintech enables other stakeholders to make better/optimal financial decisions which will improve their wealth and satisfaction. This paper presents the initial stages in examining the potential application of basic machine learning algorithms for the prediction of stock prices on the Belgrade Stock Exchange (BELEX). The results showed that future research is needed to increase dataset and improve quality of data in order to adapt modern and more advanced machine learning methods to achieve higher accuracy in forecasting stock prices. The additional value of this research is the database that combines data from the BELEX, indicators of the company's success and economic parameters of Serbia's growth in the period from 2010 to 2022 and is the basis not only for this but also for future research.

The third paper in the field of circular economy presents the results of the project supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Grant No. 0801-417/1). The aim of the paper was to develop a specific replicating conceptual model for the establishment and maintenance of a circular supply chain for biogas production at the community level. The village Ilandža (Serbia) was selected to pilot the model, with four main goals: risks and benefits identification, spatial analysis, crops and by-products evaluation, and capacity building and sustainability.



The research showed that a balanced application of energy crops cultivation and by-product utilization can result in biogas supply chain sustainability. Biogas production actions should be planned according to areas, energy crops, and by-products priority lists developed participatory. Entrepreneurs' capacities should be strengthened enough to implement such a comprehensive model. A monitoring system should be defined as participatory and should be applied during the implementation of each community-driven biogas project. Also, evaluation of strategies should be conducted after each project. All stakeholders must be informed of the importance of sustainable community-based entrepreneurship and actions.







# ARE SERBIAN COMPANIES READY FOR THE GERMAN SUPPLY CHAIN DUE DILIGENCE ACT?

Lidija Barjaktarović<sup>1\*</sup>,  
Danko Kalkan<sup>2</sup>

<sup>1</sup>Singidunum University,  
Belgrade, Serbia

<sup>2</sup>Ernst & Young d.o.o.,  
Belgrade, Serbia

## Abstract:

The subject of the research is to determine the impact of the German Supply Chain Due Diligence Act on Serbian companies that are potentially part of the supply chain of German companies. The aim of the research is to estimate whether Serbian companies are ready for the usage of the German Act. The sample consists of 46 companies that are members of the German-Serbian Chamber of Commerce (AHK) in 7 relevant industries: automotive parts production, logistics and transport, construction, metal and metal processing, agriculture and food, textile and clothing, and chemical. The source of the information is data published on the sites of those companies for the period 2020-2022. Research results show that Serbian companies are mostly aware of the need to align with international standards regulating human rights and environmental protection. Our research shows that certain companies stand out in this regard and those are the following: Brose, Continental Automotive, Leoni Wiring Systems Southeast, Holleman transport, Nelt Co, Xella Serbia, Knauf Insulation, GEZE, Delta Agrar, Henkel Serbia, and Elixir Group.

## Keywords:

the German Act, human rights, environment, due diligence, sustainable supply chain.

## 1. INTRODUCTION

In the second half of the last century, the United Nations General Assembly (UNGA) recognized various increasing environmental problems (E) accompanied with the ascent of living standards of the world population. Accordingly, the UNGA introduced different commissions and working groups in order to define adequate acts, frames, and guidelines for achieving sustainable development. (CFA Society United Kingdom, 2021). Consistent with this, the UN Guiding Principles on Business & Human Rights (UNGP) were introduced in 2011. It is a global framework for states and companies to prevent, address, and remedy human rights (HR) abuses committed in business operations. The UNGP consists of 31 principles deployed under 3 pillars: (1) the state's duty to protect HR, (2) the corporate responsibility to respect HR, and (3) access to remedy.

Due diligence (DD) represents the process which companies have in establishing risk management, in order to recognize, prevent, and decrease current and potentially negative influences in the area of HR and E in the supply chain. Partners in the supply chain, buyers, and sellers share a common responsibility in the fulfillment of requirements and the decreasing of risks related to HR and E (OECD, 2011).

It should be mentioned that the UN's and OECD's guidance have voluntarily impacted companies' businesses. In order to become obligatory, some economies have been introducing specific laws on DD, including Germany, the United Kingdom of Great Britain, France, and the Netherlands.

Correspondence:  
Lidija Barjaktarović

e-mail:  
lbarjaktarovic@singidunum.ac.rs



The Federal Republic of Germany adopted The Supply Chain Due Diligence Act (SCDDA, or the German Act) in 2021 with two-stage implementation from 01/01/2023 (Bundestag, 2021). The integration of SCDDA implementation (discussed in the second chapter) represents an introduction for the European Directive on corporate sustainability DD, whose proposal was adopted in the first half of 2022 (European Commission, 2022), and whose application is expected to start in 2024-2025.

Having in mind that Germany is one of the most important Serbian export-import partners; this means that the SCDDA has a potential influence on Serbian companies that are part of the supply chain of German companies (RBH, 2023). Accordingly, the subject of the research is to determine the impact of the SCDDA on Serbian companies that are potentially part of the supply chain of German companies. The aim of the research is to estimate whether Serbian companies are ready for the usage of the German Act.

On August 28, 2014 in Berlin, the project titled “Supplier Initiative of the Western Balkans” began as part of Berlin’s initiative. The purpose of the project is to provide concrete and effective support to the countries of the Western Balkans (WB) in their efforts to strengthen their economy. The aim of the regional B2B (business-to-business) project is for German companies to find suppliers from targeted industrial areas in Serbia and the countries of the WB. German companies are mainly interested in the sector of metal processing, automotive parts production, plastic processing and plastic parts production, as well as suppliers to the electrical industry. The German-Serbian Chamber of Commerce (AHK) is a project owner for WB region, and they have proceeded it together with BME (Bundesverband Materialwirtschaft, Einkauf und Logistik.V.). Last year in Stuttgart, there were 24 German companies and 105 suppliers from the WB (out of which 30 are located in Serbia, i.e., 28.6% of all WB suppliers).

According to Ernst and Young (EY) (2023), the industries which will be affected by the SCDDA are the following: textile and clothing, the electronic industry, agriculture and food, mining and other extractive industries, construction, the metals and minerals supply chain, palm oil industry, and the fishing industry.

The research consists of five chapters. The introduction chapter is the first. The German Act is presented in the second chapter. Methodology is the subject of the third chapter. The Research results are presented in the fourth chapter. The last chapter is the conclusion.

2. THE GERMAN ACT

The German Act (Bundestag, 2021) has influence on all German (domestic-owned) and foreign-owned companies with a regional office in Germany:

- (I) Applicability starting from: (1) 2023 for companies with at least 3,000 domestic employees, (2) 2024 for companies with at least 1,000 domestic employees,
- (II) Covering: (1) own business area at home and abroad, (2) supply chain related to all products and services include: direct suppliers (contractual partners) and indirect suppliers - event-related with substantiated knowledge.

These companies have a DD obligation to provide performing business in compliance with E and HR protection in the total supply chain. Legal positions protected under the German Act are clearly defined and relate to HR and E.

In accordance with the SCDDA, companies are obliged to have the following: (1) a policy statement and internal responsibilities, (2) HR and E risk management and risk analysis (annual, event-related), (3) preventive measures and remediation, (4) a grievance mechanism,

Figure 1. E and HR coverage area of the SCDDA.

E	HR
Non-environmental friendly handling	Child labor
Collection, storage and disposal of waste	Forced Labor
Production and use of persistent organic pollutants (Stockholm Convention)	Slavery
Production of mercury-added products, use of mercury and mercury compounds,	Disregard for occupational health and safety
Treatment of mercury waste (Minamata Convention)	Disregard of freedom of association
Export and import of hazardous waste (Basel Convention)	Unequal treatment in employment
Harmful contamination of soil, water and air	Hiring/use of private/public security forces in violation of HR
Harmful noise emission and excessive water consumption	Withholding of adequate wages
Unlawful eviction and unlawful deprivation of land, forest and waters	



(5) effectiveness-tracking of measures and mechanisms (annual, event-related), (6) internal documentation and external reporting (annual, 4 months after forecasted year ends). If these conditions are not met, the company will face penalties.

The law mandates that companies are required to assume responsibility for their upstream supply chain, while also distinguishing between suppliers that are directly and indirectly engaged. In accordance with SCDDA, companies are also obliged to: 1) do the assessment of risk at the same time as they identify a violation of E and HR in the supply chain in the case of any of their indirect suppliers, 2) take proactive and efficient measures to continue sustainable business.

It can be observed that the SCDDA establishes an overall set of requirements which covers introduction of risk management system that will be in compliance with E and HR in supply chain, i.e, provides sustainable supply chains. Establishment of risk management in sustainable supply chain involves: increased trust, reduced costs, additional growth, and improved transparency and DD multipliers. It implies a five-step approach to achieve regulatory compliance and create direct value:

- 1. Access status quo (gap analysis) - identify, assess, and prioritize potential risks and opportunities to take action at the right time;
- 2. Define strategy – define appropriate, as well as effective, measures and objectives of a sustainable supply chain;

- 3. Shaping transformation – implementation process, structures, and systems to operationalize transformation;
- 4. Monitor and optimize – use real-time transparency along the supply chain to improve the effectiveness of measures;
- 5. Report and communicate – collect reliable information efficiently, and communicate effectively with the stakeholder to build trust.

Finally, it should be mentioned that companies will be subject to penalties if they do not perform business in accordance with the SCDDA.

Figure 2. SCDDA requirements for the companies.

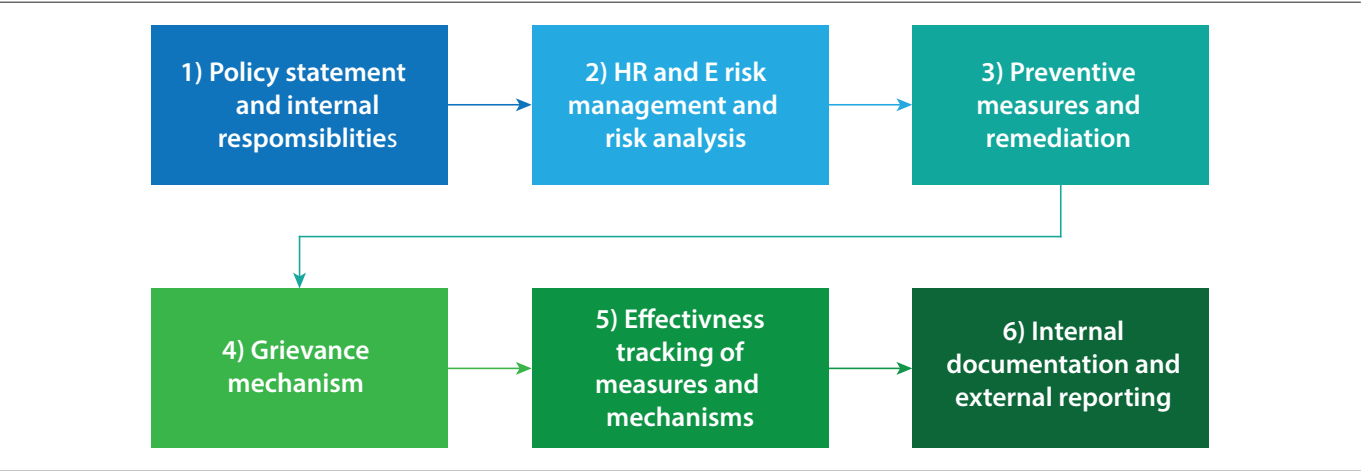


Figure 3. SCCDA Five-step approach.







### 3. METHODOLOGY

The basis of the research is relevant to companies' that are members of AHK as of July 31, 2023. The final sample of chosen companies is based on criteria defined by:

1. Information based on the site of AHK - industries affected by the SCDDA are: metal processing, automotive parts production (automotive), plastic processing and plastic parts production, and electrical industry; AHK recognizes logistic and transport as an important industry for the entirety of the Serbian economy, and they have established a separate committee in order to improve the business environment.
2. Meeting with representatives of the Serbian Chamber of Commerce in charge for Responsible Business Hub (RBH) held on August 4, 2023. RBH is the first service center established by the Serbian Chamber of Commerce in cooperation with German Organization for International Cooperation (GIZ) in order to improve the ability of suppliers based in Serbia to adapt and comply with these new regulations and requirements in the first quarter of 2023. In accordance with it, RBH had questions from companies that perform business in the following industries: automotive, metal and metal-processing, textile, and food industry.
3. EY Research (2023) –companies that will be influenced by the SCDDA perform business in the following industries: textile and clothing, electronics, agriculture and food, mining and other extractive industries, construction, metals and minerals supply chain, the palm oil industry, and the fishing industry.

It used to be a three-step analysis, in which authors cross-checked information (financial and non-financial) on the sites of AHK, the Serbian Business Register Agency (APR), and companies (and their headquarters or groups or holdings in the period of 2020 to 2022), members of AHK, in the period from August 8-August 14, 2023.

As of July 31, 2023, there have been 423 members of AHK. In the first phase of analysis, on the basis of information related to the country origin of AHK's members (37 members are not located in Serbia i.e., 8.7%), and industry that is not impacted by SCDDA (211 members, i.e., 49.9% where export-import and domestic trade and distribution account for 32.23%); media, communication, and publishing (11.37%); hospitality, tourism, and health (10.43%); auditing, accounting, and consulting services (9.48%); lawyers (9%); financial intermediaries and consultants (9%); real estate services (4.74%); education (3.9%); representative offices (3.79%); pharmacy (3.32%); associations (1.9%); retail chains (0.95%) - 248 companies

are excluded from further analysis for the purpose of this paper (58.6% of all AHK members). Therefore, the focuses of further analysis are 175 AHK's members, i.e., 41.4%.

In the second phase of defining a relevant sample, the focus was on the targeted industries, and whether the company is a producer or a distributor/trader. Accordingly, 52 (i.e., 29.71% of the sample of 175 AHK's members) companies in 8 industries were identified: 13 in automotive, 12 in logistics and transport, 6 in construction, 5 in metal and metal processing, 5 in electronics, 5 in agriculture and food, 4 in the textile industry, and 2 in the chemical industry (proposal of authors on the basis of their activity and the influence of the SCDDA).

In the third phase, a targeted sample of companies in adequate industries, i.e., impacted by the SCDDA, was identified. On the basis of further analyses, 6 companies were excluded: 1 in the construction industry (because the representative was organized as a holding company and the information of basic activity is not in construction) and 5 from the electronics industry (because 1 of them is already a subject of research in the metallurgy industry – Inmold group Požega; while 4 of them are connected companies of German big companies which are already influenced by the SCDDA, i.e., they adjusted their business model in accordance with the requirements – Siemens' 2 companies: Siemens d.o.o. Belgrade and Flender d.o.o. Subotica, SAP West Balkans d.o.o. Belgrade and Robert Bosch d.o.o. Belgrade. As such, the final sample consists of 46 companies (26.29% of the sample of 175 AHK's members) in 7 relevant industries. Accordingly, the subject of analysis is the following:

1. Automotive industry (13): Auto-kabel d.o.o. Mionica, Boysen Abgassysteme d.o.o. Subotica, 4M Specijalni alati d.o.o. Novi Banovci, Brose Belgrade d.o.o. Pančevo, Continental Automotive d.o.o. Novi Sad, DAD Dräxlmaier Automotive d.o.o. Zrenjanin, Gomma Line d.o.o. Kragujevac, Grammer System d.o.o. Aleksinac, KNOTT Autoflex YUG d.o.o. Bečej, Koenig Metall d.o.o. Ivanjica, Leoni Wiring Systems Southeast d.o.o. Prokuplje, Vorwerk Autotec Serbia d.o.o. Preljina, ZF Serbia d.o.o. Pančevo;
2. Logistics and transport (12): Fercam d.o.o. Beograd, Gebrüder Weiss d.o.o. Beograd, Hödlmayr Zastava d.o.o. Kragujevac, Holleman transport d.o.o. Beograd, ISCO d.o.o. Zrenjanin, M&B Trans d.o.o. Novi Slankamen, M&M Militzer & Münch Transport & Logistics d.o.o. Dobanovci, Milšped Group Beograd, Nelt Co d.o.o. Beograd, Perić Trans Company d.o.o. Beograd, Schenker d.o.o. Novi Banovci, Union Šped d.o.o. Beograd;
3. Construction (5): GP Gradjevinar d.o.o. Beograd, Jadran d.o.o. Beograd, Xella Srbija d.o.o. Beograd, Knauf Zemun d.o.o., Knauf Insulation d.o.o. Zemun;



4. Metal and metal processing (5): GEZE d.o.o. Zrenjanin, Grindex d.o.o. Kikinda, Inmold group Požega, M-Inox Konstrukt d.o.o. Šabac, Mecafor Products d.o.o. Kikinda;
5. Agriculture and food (5): Dr. Oetker d.o.o. Simanovci, Delta Agrar d.o.o. Beograd, Meggle Srbija d.o.o. Kragujevac, Carl Kuehne d.o.o. Sremska Mitrovica, Mamminger Konserven–SRB d.o.o. Gospodjinci;
6. Textile and clothing (4): 8. Mart d.o.o. Subotica, FALKE Serbia d.o.o. Leskovac, Luss textile d.o.o. Raška, Proleter AD fabrika čarapa Ivanjica;
7. Chemical industry (2): Henkel Srbija d.o.o. Belgrade and Elixir group Šabac.

In the text that follows, only the name of the company without legal form and headquarters will be used.

#### 4. RESEARCH RESULTS

The basic characteristics of the sample are presented in Appendix/Table 1. The sample consists of 46 privately owned companies, mainly in foreign equity ownership (80.43%), which perform business in 7 industries, accordingly: 28.26% automotive industry, 26.09% logistics and transport, 10.87% construction, 10.87% metal and metal processing, 10.87% agriculture and food, 8.7% textile and clothing and 4.34% chemical industry. Furthermore, foreign equity ownership structure per industry is as follows: 100% automotive, 100% textile and clothing, 80% metal and metal processing, 80% agriculture and food, 66.67% logistics and transport, 60% construction, and 50% chemical industry. Five AHK members are registered as a group of connected companies (Delta Agrar, Inmold group, Elixir group, Milšped group, Knauf), where 80% are in domestic ownership (italic font in Appendix/Table 1).

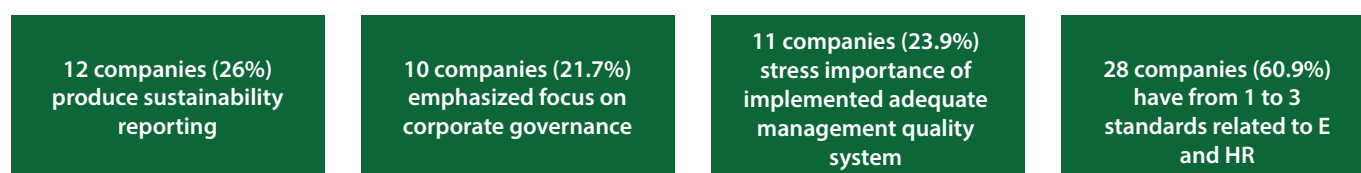
It is important to take note that the companies are located evenly in all Serbian regions. Furthermore, it can be observed that all the analyzed companies are aware of the importance of sustainability in business and its impact on E, social and governance issues. However, they have different practices in publishing non-financial information (in terms of quality and quantity) on their sites.

Accordingly, own way (unique in the meaning of analyzed companies) in performing sustainable business is clearly emphasized by 2 companies (4.35%): ZF (automotive industry) and Mecafor Products (metal and metal processing industry).

12 companies in the sample (26.09%) published sustainability reports on the group level. They are: (1) 4 in automotive (30.77%): Brose, Continental Automotive, Leoni Wiring Systems Southeast and ZF; (2) 2 logistics and transport (66.67%): Holleman transport and Nelt Co, (3) 2 in construction (40%): Xella Serbia and Knauf Insulation, (4) 2 chemical industry (100%): Henkel Serbia and Elixir Group, (5) 1 in metal and metal processing (20%): GEZE, and (6) 1 in agriculture and food (20%): Delta Agrar. The most information about applied standards in preparing of sustainability reports (in terms of Global and European frameworks and guidelines relevant for non-financial reporting) were given by companies in the automotive industry: Continental Automotive, Leoni Wiring Systems Southeast and ZF. However, research shows that these companies are aware of the development of the new EU directives related to non-financial reporting and sustainability (PKS & GIZ, 2023), which covers the area of corporate governance, strategy, risk management (influence, risks and opportunity management), and metrics and targets. Additionally, in the case of 7 companies, information can be found concerning respecting GRI standards (Global Reporting Initiative), which helps companies estimate and report on their own economical, E, and social impact in clear, consistent, and comparable way (PKS & GIZ, 2023), i.e., Brose, Continental Automotive, Holleman transport, Nelt Co, Xella Serbia, Delta Agrar, and GEZE.

10 companies in the sample (21.7%) clearly stressed that they introduced corporate governance into their businesses. They are: (1) 5 in the automotive industry (38.46%): Brose, Continental Automotive, Grammer System, Leoni Wiring Systems Southeast and ZF; (2) 1 in logistics and transport (8.33%): Nelt Co, (3) 2 in agriculture and food (40%): Dr. Oetker and Delta Agrar, and (4) 2 in chemical industry (100%): Henkel Serbia and Elixir group.

Figure 4. Key findings.





Furthermore, 11 companies from the sample (23.91%) clearly inform all stakeholders of the importance of implemented adequate management quality system. They are: (1) 4 in logistics and transport (33.33%): Fercam, Gebrüder Weiss, ISCO and Milšped Group, (2) 3 in construction (60%): Gradjevinar, Jadran and Knauf, (3) 1 in agriculture and food (20%): Mamminger Konserven - SRB, and (4) 3 in textile and clothing industry (75%): 8.mart, FALKE Serbia and Proleter fabrika čarapa. It is important to stress that 6 companies are especially committed to:

1. QHSE (quality, health, safety, and the environment)/HSQE (health, safety, quality, and the environment) standards - 3 companies: 2 in logistics and transport (Fercam and Gebrüder Weiss), and 1 in agriculture and food (Mamminger Konserven); and
2. BSCI initiative (of the Foreign Trade Association, to improve the political and legal framework for trade in a sustainable way) – 3 companies in the textile and clothing industry: 8.mart, FALKE Serbia (which simultaneously follow ZDHC initiative (Zero Discharge of Hazardous Chemicals)) and Proleter fabrika čarapa. It follows the OECD's guidelines on responsible supply chains in the garment and footwear industry.

Having in mind that the most important characteristic, value, and approach of all analyzed companies is related to the quality, it should be mentioned that 28 companies obtained international standard certification (60.87%). Companies that received the certification are: (1) 5 in the construction industry (100%): Gradjevinar, Jadran, Xella Serbia, Knauf Zemun, Knauf Insulation, (2) 4 companies in the metal and metal processing industry (80%): Grindex, Inmold, M-Inox and Mercafor Products, (3) 3 companies in textile and clothing (75%): 8.mart Subotica, FALKE Serbia, and Proleter fabrika čarapa, (4) 7 companies in logistics and transport (58.33%): Fercam, M&B Trans, M&M Militzer & Münch Transport & Logistics, Milšped group, Nelt Ltd, Peric Trans Company, Union Sped, (5) 7 companies in the automotive industry (53.85%): Boysen Abgassysteme, 4M Specijalni alati, Gomma Line, KNOTT Autoflex YUG, Koenig Metal, Vorwerk Autotec Serbia, ZF Serbia, (6) 2 in agriculture and food (40%): Delta Agrar and Meggle. It can be concluded that those companies (regardless of ownership structure or industry) have a high awareness of the importance of the German Act, and of sustainable supply-chains. It is in line with the conclusion of talks between RBH and AHK representatives that Serbian companies are not high risky from the perspective of SCDDA act.

The majority (28, i.e., 60.87%) of analyzed companies have a minimum of 1, maximum of 3, standards related to HR and E. Those standards are: ISO 9001 (quality management system), ISO 45001 (occupational health and safety (OH&S) management system), and ISO 14001 (environmental management system). Companies in the automotive industry, which in absolute number is the biggest group, have only the mentioned standards. It is in line with the words of representatives of RBH companies from the automotive industry, which have the highest knowledge (awareness) of the German act. Other analyzed companies in different industries have more standards specific to their basic activity in order to provide adequate quality of the product/service to customers. In the case of: (1) the construction industry, those companies have the necessary licenses issued by relevant state authorities in order to perform construction works; and (2) the textile and clothing industry have certifications in standard OEKO-TEX Standard 100 (for textiles tested for harmful substances). This is in line with the findings of RBH, that Serbian companies will be capable to adopt their business in accordance with SCDDA.

It can be observed that there are 12 companies in the sample (26.09%) that have a code of conduct, of which, at the same time, 5 of them (10.87%) have a suppliers' code of conduct. Companies that have code of conduct are: (1) 3 in textile and clothing (75%): 8.mart, FALKE Serbia and Proleter fabrika carapa, (2) 3 in the automotive industry (23.08%): Auto-kabel, DAD Dräxlmaier Automotive and Gomma, (3) 2 in chemical (100%): Henkel Serbia and Elixir Group, (4) 1 in construction (20%): Xella Serbia, (5) 1 in metal and metal processing (20%): Inmold group, (6) 1 in agriculture and food (20%): Meggle and (7) 1 in logistics and transport (8.33%): Hödlmayr Zastava. Companies that have a suppliers' code of conduct are: (1) 3 in textile and clothing: 8. mart, FALKE Serbia and Proleter fabrika čarapa, (2) 1 in construction: Xella Serbia and (3) 1 in the automotive industry: DAD Dräxlmaier Automotive.

It is important to stress that there are 2 companies in the sample of 46 (4.34%) that clearly emphasized the importance of cooperation between academia and industry in order to develop relevant products for the market and to properly educate staff. They are Brose (automotive industry) and the Inmold group (metal and metal-processing industry). Brose established a Research and Development (R&D) Center in Pančevo and concluded an agreement with the Faculty of Mechanical Engineering and School of Electrical Engineering of the University of Belgrade in order to engage their students and experts on those activities. The Inmold group takes part in dual education in Požega.





## 5. CONCLUSION

It can be concluded that companies in Serbia, regardless of ownership, are prepared for the requirements of the new German law. This can be explained with the existence of the project “Supplier initiative of the WB” (which lasts nine years with the purpose of finding suppliers to German companies from targeted areas in Serbia), and the basic activity of AHK members (almost 35% of them are in the relevant fields of consulting, auditing, accounting, finance, law services and financial intermediaries, representative offices).

It can be concluded that the analyzed Serbian companies, members of AHK, are mostly aware of the need to align with international standards regulating human rights and environmental protection. They have varying practice in communicating these topics. Our research shows that certain companies stand out in terms of implementing better sustainability practices and those are the following: Brose, Continental Automotive, Leoni Wiring Systems Southeast, Holleman transport, Nelt Co, Xella Serbia, Knauf Insulation, GEZE, Delta Agrar, Henkel Serbia, and Elixir Group.

In the case that companies encounter challenges in introducing risk management in their business model, it will be useful to apply COSO’s Enterprise Risk Management Framework (2017) and COSO’s Guideline for applying Enterprise Risk Management to environmental, social, and governance-related risks (2018). Accordingly, companies should educate their employees in order to implement it, and/or to engage experts/consultants for that purpose.

## 6. ACKNOWLEDGMENT

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## 7. LITERATURE

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Sites of analyzed company members of AHK (2023)

United Nations (2011) United Nations Guiding Principles on Business and Human Rights



## APPENDIX

**Table 1.** Information on analyzed sample of companies.

No	Company/Industry	Origin of equity		SCDDA risk components		Other important elements for risk management in supply chain
		Domestic	Foreign	E	HR	
(I) AUTOMOTIVE PARTS PRODUCTION		0	13	+	+	
1.	Auto-kabel d.o.o. Mionica		+	+	+	Code of conduct;
2.	Boysen Abgassysteme d.o.o. Subotica		+	+	+	Working conditions statement; DIN EN ISO 14001:2015
3.	4M Specijalni alati d.o.o. Novi Banovci		+	+	+	ISO 9001, ISO 18001, ISO 14001
4.	Brose Belgrade d.o.o. Pančevo		+	+	+	R&D center in Pančevo; concluded an agreement with the Faculty of Mechanical Engineering and School of Electrical Engineering of the University of Belgrade; Sustainability report including GRI;
5.	Continental Automotive d.o.o. Novi Sad		+	+	+	Corporate Governance is established, as well as Sustainability framework, including reporting /UN Global Compact, SDG, EU taxonomy, TCFD, GRI, SABS, GRI/;
6.	DAD Dräxlmaier Automotive d.o.o. Zrenjanin		+	+	+	Special attention to sustainability in supply chain and compliance issues; Code of conduct; Code of suppliers' behavior;
7.	Gomma Line d.o.o. Kragujevac		+	+	+	ISO 9001:2015, ISO 16949:2016, ISO 14001:2015; Business codex;
8.	Grammer System d.o.o. Aleksinac		+	+	+	Corporate governance, Sustainability, Compliance;
9.	KNOTT Autoflex YUG d.o.o. Bečej		+	+	+	9001:2015, ISO 14001:2015, ISO 45001:2018 -
10.	Koenig Metall d.o.o. Ivanjica		+	+	+	ISO 1649: 2016, ISO 9001:2015, ISO 14001:2015; DIN EN ISO 27001:2017
11.	Leoni Wiring Systems Southeast d.o.o. Prokuplje		+	+	+	Corporate Governance, Sustainability (including reporting / UN Global Compact) and Compliance;
12.	Vorwerk Autotec Serbia d.o.o. Preljina		+	+	+	ISO 14001:2015, IATF16949_2016, ISO45001_2018;
13.	ZF Serbiad.o.o.Pančevo		+	+	+	Emphasized certification: ISO 14001:2015, ISO 9001:2015; Sustainability framework and reporting /UN Global Compact, OECD, EU taxonomy/; ZF way – ZF DNA of quality policy;
(II) LOGISTICS AND TRANSPORT		4	8	+	+	
1.	Fercam d.o.o. Beograd		+	+	+	QHSE framework implemented; ISO 14001:2015, ISO 45001:2018
2.	Gebrüder Weiss d.o.o. Beograd		+	+	+	HSQE policy;





3.	Hödlmayr Zastava d.o.o. Kragujevac		+	+	+	Code of conduct; Anti-corruption policy;
4.	Holleman transport d.o.o. Beograd		+	+	+	Sustainability framework and reporting (GRI);
5.	ISCO d.o.o. Zrenjanin		+	+	+	System quality management certification issued by Serbian Ministry of Army in 2010;
6.	M&B Trans Novi d.o.o. Slankamen	+		+	+	Certification: ISO 9001:2015 ISO 14001:2015 HACCP; GMP (good business practice)
7.	M&M Militzer & Münch Transport & Logistics d.o.o. Dobanovci		+	+	+	Certification: ISO (9001:2015), AEO, IATA;
8.	Milšped Group Beograd	+		+	+	ISO 9001, HACCP, ISO 45001 TAPA FSR & TSR ; AEO; Milšped quality management;
9.	Nelt Co d.o.o. Beograd		+	+	+	Corporate Governance; Sustainability including reporting / member of UN Global Compact; ISO 9001:2015, ISO 27001:2013, ISO 5001:2018;
10.	Perić Trans Company d.o.o. Beograd	+		+	+	AQS certification - Good Distribution Practice and HACCP; ISO 9001:2015, SRPS ISO 9001:2015; RINA Services S.p.A. - ISO / IEC 17065;
11.	Schenker d.o.o. Novi Banovci		+	+	+	Corporate Sustainability;
12.	Union Šped d.o.o. Beograd	+		+	+	ISO 9001, ISO 45001, ISO 14001;
<b>(III) CONSTRUCTION INDUSTRY</b>		<b>2</b>	<b>3</b>	<b>+</b>	<b>+</b>	
1.	GP Gradjevinar d.o.o. Beograd	+		+	+	Certification ISO 45001, ISO 9001 and ISO 14001; Licenses of relevant states institution for performing the business; QMS, EMS, (OH&S);
2.	Jadran d.o.o. Beograd	+		+	+	Certified management systems: EnMS 0003 ISO 50001, IS 0014 ISO 27001, QS 0365 ISO 9001, ES 0133 ISO 14001, EH 0081 OHSAS 18001; Certification: GCI ISO 37001, ICC ISO/IEC 17021-1; Licenses of relevant states institution for performing the business;
3.	Xella Srbija d.o.o. Beograd /Xella Serbia/		+	+	+	Sustainability framework including reporting; code of conduct; suppliers' code of conduct;
4.	Knauf Zemun d.o.o.		+	+	+	System management quality; Certification ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018;



5.	Knauf Insulation d.o.o. Zemun		+			Sustainability framework including reporting /GRI/;
<b>(IV) METAL AND METAL PROCESSING</b>		<b>1</b>	<b>4</b>	<b>+</b>	<b>+</b>	
1.	GEZE d.o.o. Zrenjanin		+	+	+	Sustainability framework and reporting (GRI);
2.	Grindex d.o.o. Kikinda		+	+	+	Certification: ISO 9001:2008; ISO 14001;
3.	Inmold group Požega	+		+	+	Certification: ISO 9001, ISO 14001; IATF: 1649:2016; Business codex; Promote system of dual education; Green agenda;
4.	M-Inox Konstrukrt d.o.o. Šabac		+	+/-	+/-	Certification: DIN EN ISO 3634-2;
5.	Mecafor Products d.o.o. Kikinda		+	+	+	Certification: ISO 45001, ISO 9001 & IATF 16949, ISO 14001; The QHSE2 policy; Own way;
<b>(V) AGRICULTURE AND FOOD</b>		<b>1</b>	<b>4</b>	<b>+</b>	<b>+</b>	
1.	Dr. Oetker d.o.o. Šimanovci		+	+	+	Corporate governance, Responsibility, Quality policy; Compliance;
2.	Delta Agrar d.o.o. Beograd	+		+	+	Sustainability framework including reporting (GRI); system of corporate governance is in place; Relevant certification: ISO 9001, ISO 14001, ISO 45001, ISO 22000, Global Gap, SMETA, HACCP, HALAL, IFS;
3.	Megle Srbija d.o.o. Kragujevac		+	+	+	Certification: Halal, HACCP, IFS Food, ISO 22000:2005; Quality management;
4.	Carl Kuehne d.o.o. Sremska Mitrovica		+	+	+	Code of conduct;
5.	Mamminger Konserven - SRB d.o.o. Gospodjinci		+	+/-	+/-	Quality management;
<b>(VI) TEXTILE AND CLOTHING</b>		<b>0</b>	<b>4</b>	<b>+</b>	<b>+</b>	
1.	8.mart d.o.o. Subotica		+	+	+	Certification: OEKO-TEX Standard 100; Member of BSCI initiative and work in accordance with C&A codex in order to improve S and E in supply process;
2.	FALKE Serbia d.o.o. Leskovac		+	+	+	Sustainability; Quality management; Codex for the company and their suppliers; Certification: OEKO-TEX Standard 100,OCS, RCS; Work in accordance with BSCI code of conduct and ZDCH initiative;



3.	Luss textile d.o.o. Raška	+	+	+	Responsible and ethical behavior toward all stakeholders, especially E and S. Employees are the most important strength of the company;
4.	Proleter AD fabrika čarapa Ivanjica	+	+	+	Certification: OEKO-TEX Standard 100, Work in accordance with BSCI initiative;
<b>(VII) CHEMICAL</b>		<b>1</b>	<b>1</b>	<b>+</b>	<b>+</b>
1.	Henkel Srbija d.o.o. Belgrade /Henkel Serbia/				Responsible Corporate Governance; Sustainability framework including reporting /UN Global Compact; Code of conduct; Innovation; Digitability;
2.	Elixir group Šabac	+	+	+	Corporate Governance; Sustainability, innovation; responsibility; Code of conduct;
<b>46</b>	<b>TOTAL</b>	<b>9</b>	<b>37</b>		

Source: (sites of analyzed companies, August 2023).



# TOWARD STOCK PRICE FORECASTING ON NEWLY ACQUIRED BELEX DATASET

Lidija Barjaktarović<sup>1\*</sup>,  
Marko Barjaktarović<sup>2</sup>,  
Mihailo Todorović<sup>3</sup>,  
Ana Obradović<sup>3</sup>

<sup>1</sup>Singidunum University,  
Belgrade, Serbia

<sup>2</sup>School of Electrical Engineering,  
University of Belgrade,  
Belgrade, Serbia

<sup>3</sup>PhD candidate,  
Singidunum University,  
Belgrade, Serbia

## Abstract:

Currently there is a lot of research with the aim of applying machine learning in stock price prediction as one of the challenging trends in fintech. Fintech helps to other stakeholders to make better/optimal financial decisions which will improve their wealth and satisfaction. In this paper, the first steps in examining the potential application of basic machine learning algorithms for the prediction of stock prices on the Belgrade Stock Exchange (BELEX) are presented. The results showed that future research is needed to increase dataset and improve quality of data in order to adapt modern and more advanced machine learning methods to achieve higher accuracy in forecasting stock prices. The additional value of this research is the database that combines data from the BELEX, indicators of the company's success and economic parameters of Serbia's growth in the period from 2010 to 2022 and is the basis not only for this but also for future research.

## Keywords:

stock price forecasting, machine learning, linear regression, support vector regression, multi-layer perceptron.

## 1. INTRODUCTION

Contemporary, the fintech topic is on the high interest of different stakeholders including industry and academia. There are different definitions of fintech based on the different contexts and across countries, while the common point is the way of creating the term. The term comes from the first three letters of the words “financial” and “technology” (Schueffel, 2016). Moreover, fintech is defined by the Financial Stability Board FSB as “technology-enabled innovation in financial services that could result in new business models, applications, processes, or products with an associated material effect on the provision of financial services.” (IMF, 2022) According to Kagan (2023) of fintech “refers to any application, software, or technology that allows people or businesses to digitally access, manage, or gain insights into their finances or make financial transactions.” Jović et al. (2019) and Jourdan et al. (2023) fintech is the name used for companies or new financial industry that develop or use the latest information technology in order to improve financial services and activities or to introduce new one. Furthermore, the term mainly connects with companies that implement information technology (IT companies) services to banks and other financial institutions (IMF, 2022). Moreover, Alt et al. (2018) stressed that fintech is revolution that had evolved from offline, hierarchical, process-oriented organizations to digital, agile, customer-centric system and stated. Complementary development of fintech will require cooperation between academia and industry (Jović et al., 2019).

Correspondence:  
Lidija Barjaktarović

e-mail:  
lbarjaktarovic@singidunum.ac.rs



Fintech has been applied to many areas of finance. Some of them are (Jourdan et al., 2023; Kagan, 2023; Lagani & Ravishankar, 2022; IMF, 2022; Allen et al., 2021;):

1. Payments - execution of /instant/ payment orders, internet and mobile payments (or e-money), personal finance, online identification, other important innovations;
2. Deposit and lending - Peer-to-peer (P2P) lending platforms which allow individuals and small business owners to receive loans from an array of individuals who contribute microloans directly to them; credit scoring;
3. Insurtech - is an abbreviated term for insurance technology and refers to innovative technologies and new digital tools developed to optimize the performance of insurance companies (International Association of Insurance Supervisors 2017 in IMF, 2022).
4. Other financial services: capital raising, investment management, and market provisioning (do not require amendments in the statistical methodology); in addition, big tech companies may also be providing financial services enabled by technologies. Accordingly, applications robo-advisors and wealth management, investments (to buy and sell stocks and/or and crypto currency from mobile device, often with little or no commission); Crypto apps, including wallets, exchanges, and payment applications, allow you to hold and transact in crypto currencies and digital tokens (like Bitcoin and non-fungible tokens /NFTs/).

According to the World Bank (2022) and Lagani & Ravishankar (2022), most research considers different forms of financial intermediation between different parties. Also, it can be noticed that fintech helps other stakeholders to make better i.e., optimal financial decisions, which will improve their wealth and satisfaction. In accordance with the definition of fintech, it means that new technologies, such as machine learning/artificial intelligence, predictive behavioral analytics, and data-driven marketing, will take the guesswork and habit out of financial decisions (Kagan, 2023; Barjaktarović et al., 2020).

To investigate the potential use of machine learning as the new technology for supporting financial decision making, this research tries to test the existing appropriate model for financial market data forecasting. This research is in line with the common trend of using machine learning tools in fintech applications, but due to the aim to enhance local knowledge; in the focus is a model for predicting the prices of securities on the Serbian capital market. In this way, this research should contribute to the further development of the local financial market, especially in terms of capital market and trading with securities, as the Serbian Government recognized these tasks as highly important in future period.

The Serbian state is awarded that it should development of financial market should be improved with application of appropriate measures. Accordingly, Serbian Strategy of industrial policy from 2021-2030 is defined as one of key challenges development of alternative financing for SME's (Small and Medium Enterprises) and innovative start-ups (10<sup>th</sup> ranked). Moreover, as special answer to the implementation of the Strategy, it prescribes increasing the availability of financial instruments for digitization and innovation in industry (1.4). The adopted Serbian Program of Economic reforms from 2023-2025 in the area of structured reform identified as one of the three crucial challenges for competitiveness and inclusion growth is improving environment favorable for investments. The capital market in the Republic of Serbia (RS) is not sufficiently developed and does not succeed into a good extent they fulfill their main function - efficient financial allocation resources of savings and investors towards the development of companies. It is widespread traditional financing through banking products (loans based on collected deposits), and the largest obstacles to the development of the capital market in RS are insufficient financial education of the population regarding the possibilities and risks of investing free funds into various financial instruments leading to a dominant orientation towards savings as the simplest form of investment, insufficiently developed economic awareness companies on the possibility of financing regular operations and research and development through the capital market, as well as an inadequate supply of domestic financial instruments available to investors. The Serbian Strategy for development of capital market from 2021-2025, the Action plan for the execution of the Strategy from 2021-2023, and new Law on Capital Market (2021) represent the basis for promotion of the Serbian capital market in the coming period, creating conditions for the use of a wider one spectrum of financial instruments by the private sector, while at the same time reducing the dependence of SME's on banks' financing and state subsidies, which makes a significant contribution to the acceleration of economic growth, increasing the number of jobs and additional support for investments in innovative industry.

This research is part of the ORCA-LAB project, funded by the Serbian Innovation Fund (ORCA-LAB, 2023). The project is about designing an all-Optical Reservoir Computing Architecture (ORCA). It includes one task in which, unlike standard synthetic tests for performance measurement of the optical neural network, real data should be used. As the implementation of neural network in photonic devices is out of the scope of this paper, only two fundamental characteristics of optical neural networks are stated here, the speed and very low power consumption, just to demonstrate their computational significance in the future.





For the testing, a financial dataset for BELEX was created, and in this paper, it will be described in brief as one of the contributions for the ORCA-LAB project, together with results obtained using the standard machine learning models. These results will be a starting point for future research and also a baseline for testing ORCA's models.

The research consists of 4 chapters. The Introduction is the first chapter. The Methodology is presented in the second chapter. The third chapter represents Research Results. The Conclusion is the last chapter.

## 2. METHODOLOGY

As it was stated in the introduction, this research is related to the following tasks of the ORCA-LAB project: 1) collecting of the data related to the: a) financial characteristics (first of all financial statements) of privately owned companies whose securities – shares are subject of the trade on BELEX, b) data related to the securities such as price of securities, volume of trading, BELEX, etc., c) macroeconomic indicators of RS (such as gross domestic product/GDP/inflation, unemployment, etc.) 2) fundamental and technical analyses for evaluation of securities (Jeremić & Terzić, 2019), 3) proposal of the model for predicting price of shares subject of trade, 4) training and testing of proposed model. The source of information is based on previously mentioned financial datasets, available open from International Monetary Fund (IMF) Data, BELEX, and Business Register Agency /BRA/ (financial reports) and received from business partner Cube Team Belgrade.

As starting point in the moment of preparing documentation for the project (06/30/20) was that:

- (I) relevant period for training and testing would be the period of 2010-2022, with making the distinction between the period before 2021, and after 2021; After the collecting data it was concluded that there three different financial reporting standards: 1) 2010-2012, 2) 2013-2020, and 3) 2021-today. So the authors of the research decided to take into the consideration period from 2013 to 2020. Furthermore, it is decided that period 2012-2019 will be used for training, and year 2020 will be used for testing.
- (II) Starting number of companies whose securities were subject of trade used to be 53; After the collecting data it was concluded that there is 24 companies (30 including different financial intermediaries which have specific reporting standards) which have all necessary data for comparison in defined period of time, especially in the terms of continuity in trading with securities.

Technical indicators which were taken into consideration are: 1) average (AVG) rate of change – due to the fact that there are not significant movements on daily level (AVG monthly price vs previous), 2) moving average (SMA) – on 50 (SMA 50) and 10 days (SMA10), 3) Bollinger bands (BB; BBLOW – indicating the lower band, and BBUP – indicating the upper band) – on 50 and 10 days. On the basis of existing data it was calculated Total Value Traded (TVT). It is supported with facts that: 1) Serbian capital market isn't sufficiently developed and it is exposed to high political risk, as component of country risk, which is evident in the weak (or zero) or dramatically high trading in particular periods of time; 2) insufficient amount of information for comparison between analysed companies or short time series comparing to the defined period of analysis.

Targeted value is average monthly change in price in January next year, due to facts that: 1) a) in RS first seven days of January are not working days; what more production companies usually do not work until 14th of January. So, many companies decide to invest available cash into short term investment alternatives on 31st of December, and withdraw (convert) it into the cash in the first half of January. b) currently collected and prepared data based is set for January (existing research of Ivanova et. al, 2018, confirmed that 80% of confident in stock price predicting is possible in January especially in the first seven days of the months in the case of oil trading on global market) and the researches' aim to test is it applicable at all and if so the data base will be expended to incorporate other months/ periods of the year; 2) Existing research for Serbian capital market confirmed that applied machine learning models: a) LS-SVM and SVM are suitable for short term stock market trend prediction (Marković et al, 2014; Marković et al., 2014a), and b) neural networks can be useful for stock market trend prediction (Kalinić et al, 2012) especially if it is taken in consideration specific characteristics of emerging markets (Ralević et al., 2013).

So, on the tested databases consist of 4 set of information (further the dataset), which can be split into two groups in terms of:

- 1) comparable financial reporting standards implemented;
- a) companies in real sector (24) with items from financial reports (expressed in form of AOP's item /automatic data processing/), calculated relevant performance and market value ratios, size of the company, number of employees, macroeconomic indicators, calculated mentioned technical indicators and their descriptive statistics (MIN and MAX values, AVG, CV – coefficient of variation; SD – standard deviation);



- b) Additionally included financial intermediaries (in total 30) without AOP's items including macroeconomic indicators, and calculated mentioned technical indicators and their components;
- 2) Period of analysis which includes: a) last quarter of the year (Q4), b) whole /one/ year; in the terms of calculated change in AVG price between two months.

So, both groups of companies have sets which include Q4 and 1 year, resulting with numbers of features that are shown in Table 1.

As this is initial study and should establish basic pipeline and baseline results for future investigation of using some newer or more complex machine learning models for stock price prediction, it incorporates three standard and easy to implement algorithms, linear regression (LR), support vector regression (SVR) and multilayer perceptron (MLP). LR is linear and the simplest ML method to understand, yet sometimes sufficient for a lot of different prediction tasks. SVR and MLP were chosen as two very common and robust algorithms that can handle both linear and non-linear dependencies in the data. Also, while the choice of algorithm depends on the specific problem and data, still SVR and MLP are among the most common used standard machine learning algorithms for stock market forecasting (Kumbure et al., 2022).

Linear regression is a statistical method used to model the relationship between a dependent variable and one or more independent variables by fitting a linear equation to the observed data. It seeks to find the best-fitting line (or hyper plane in higher dimension space) that minimizes the difference between predicted values and actual data points. Linear regression is commonly used for predictive modelling (Maulud & Abdulazeez, 2020).

Support Vector Regression (SVR) is a machine learning technique used for regression tasks, which means predicting a continuous output variable based on input features. SVR extends the principles of Support Vector Machines (SVM) to regression problems. It works by finding a hyper plane (or multiple hyper planes) that best represents the relationship between the input variables and the target variable while minimizing the prediction error. SVR aims to fit the data within a specified margin of error, which is controlled by a parameter called the epsilon (Smola & Scholkopf, 2004). SVR can handle non-linearity in the data through the use of the kernel trick, which allows SVR to implicitly map the input data into a higher-dimensional feature space where a linear relationship can be established. In the new space, the data may become linearly separable or exhibit a more favourable linear relationship. To improve accuracy, SVR uses regularization parameter C to control the trade-off between achieving a smaller margin (which reduces model complexity) and minimizing the prediction error. A smaller C allows for a

larger margin, potentially leading to a smoother, simpler model, while a larger C emphasizes fitting the training data more closely.

And MLP is a type of artificial neural network with multiple layers of interconnected neurons, including input, hidden, and output layers. Each neuron in an MLP is a mathematical function that takes weighted inputs, applies an activation function, and passes the result to the next layer. MLPs can be used for non-linear regression, where the input layer matches the number of input features and an output layer with a single neuron for single value prediction. To introduce non-linearity into the model activation function must be non-linear and the most common chose is Rectified Linear Unit (RELU) or sigmoid (Hornik et al., 2004).

The obtained dataset contains a high number of indicators and for robust prediction and to prevent over fitting as to improve accuracy reduction in number of parameters is the first step prior to train the algorithm. Usually, the most common algorithm for dimension reduction is Principal Component Analysis (PCA), but it projects original vector space to low dimension one finding the new set of basic vectors, which contains most variability in the data. Although, PCA is effective in reducing dimension of parameters, the new coordinates of feature vector are delivered for original ones, which means that it not easy to understand what they represent and how to explain them from the point of economic theories. As it is stated in previous paragraphs fintech should improve decision making, but the logic behind that theory should be explainable, and for that reason, dimension reduction is achieved using backward elimination algorithms, which keeps the original parameters that contains most of information, and ensure that the resulting model remains transparent and comprehensible to non ML experts. Backward elimination involves iteratively removing less significant features from a dataset to improve model performance and reduce computational complexity. The process typically starts with all available features and sequentially eliminates one feature at a time, assessing the impact on model performance using a chosen criterion (e.g., p-values or cross-validation scores). The process continues until no further improvement in performance is observed, resulting in a subset of the most relevant features (Pierna et al., 2009). All code was written using Python programming language and appropriate libraries like sklearn, seaborn, stats models and similar.

In this study, Root Mean Error Square (RMSE) was used as a metric for comparing three stated algorithms as one of the most common performance indicators for the regression model. Also, in the acquired data, the value zero is several times present as a target value, which means that the price will be the same on the 31<sup>st</sup> of December and 14<sup>th</sup> of January next year. When the target value is zero, it is impossible to calculate the relative error.



### 3. RESEARCH RESULTS

As was described in the previous section, the first step was parameters reduction. Of course, before the implementation of backward elimination algorithms, prediction using the complete set of indicators was performed to investigate how the prediction algorithm benefits from the parameters reduction process, Table 1.

Backward elimination was conducted on each dataset, and the resulting sets of features for each database are shown in Table 2.

Tables 1 and 2 show that the set of features that contains the most information depends on the data present in the dataset. As expected the inclusion of data from financial reports of 24 companies' results in a different list of important features. In accordance, with it for investors in shares of those companies are becoming more important items from financial reports (i.e. business success), such as long and short term financial investments, and paid and

received advance payments. The smallest error is for the LR and with a reduced feature vector, but there is a very high RMSE with extended data set when LR is used. A possible reason for the very high RMSE with the extended database can be the small database and some outliers in the feature vector, which are much better handled by SVR or MLP. When the number of features is reduced to 10, improvement for LR is significant. Also, there is some improvement for SVR and MLP.

The next step in this experiment was to investigate further improvement as it was recognized that using differentiated data can significantly improve the RMSE for some ML algorithms (Schmid et al., 2023), and an additional tests were performed with the differentiated data. The differentiated data further reduce dataset, the data for starting year must be removed from dataset as each differentiated parameter represents difference between value of that parameter in that and previous years. Tests were conducted with both a full set of parameters and only 10

**Table 1.** RMSE for 3 ML algorithms trained with full feature vector (LR, SVR, MLP) and reduced feature vector (LR\_10, SVR\_10, MLP\_10), where 10 represents the number of coordinates in the feature vector. Train and test were performed with four different dataset versions, with other feature vectors but the same target value.

MLmethod Dataset	No. of features	LR	LR_10	SVR	SVR_10	MLP	MLP_10
No_ratios_Q4	41	0.162	0.144	0.183	0.145	0.184	0.142
No_ratios_1Year	50	0.171	0.139	0.160	0.152	0.155	0.139
Ratios_Q4	313	19.77	0.171	0.117	0.108	0.188	0.128
Ratios_1Year	322	15.48	0.103	0.132	0.113	0.180	0.150

Source: Author's calculations on the basis of dataset described into the Methodology chapter.

**Table 2.** Set of features that contain most of the information for each database. The maximum number of features was set to 10.

Dataset Feature	No_ratios_Q4	No_ratios_1Year	Ratios_Q4	Ratios_1Year
Feature 1	Change in AVG price Dec-Nov	Change in AVG price Dec-Nov	Change in AVG price Dec-Nov	Change in AVG price Dec-Nov
Feature 2	CV SMA 50	Change in AVG price Apr-Mar	AOP0033	Change in AVG price Nov-Oct
Feature 3	MAX BBLOW 50	CV SMA 50	AOP0050	AOP0029
Feature 4	AVG BBUP 50	STDEV SMA 50	AOP0062	AOP0065
Feature 5	CV SMA 10	CV TVT	AOP0422	AOP0422
Feature 6	AVG SMA 10	CV BBUP 50	AOP0450	AOP0461
Feature 7	STDEV SMA 10	STDEV BBUP 50	AOP3028	AOP1026
Feature 8	CV BBLOW 10	CV SMA 10	MAX SMA 50	AOP3035
Feature 9	AVG BBLOW 10	AVG SMA 10	CV SMA 10	CV BBLOW 50
Feature 10	STDEV BBLOW 10	MIN BBUP 10	CV BBLOW 10	CV SMA 10

Source: Author's calculations on the basis of dataset described into the Methodology chapter.



with the most informative, which were selected with a backward elimination algorithm, Table 3.

Table 4 presents the most informative parameters for each dataset. It can be noticed that the data from financial reports is prevalent in the dataset of 24 companies in both period of times.

Tables 3 and 4 showed that with differentiated data, reducing the number of parameters can significantly improve RMSE, especially for LR in some cases. However, this variation in results demonstrates that this small dataset is insufficient for accurate forecasting of stock prices, especially for undeveloped stock markets like Serbian one. It might seem that a linear model is more appropriate for this dataset, but higher RMSE for SVR and MLP can be a consequence of the lack of data, as nonlinear models require more data for training. Next, number 10 is chosen as it was considered that ten features might be sufficient for improving accuracy, but this must be checked with hyper parameters tuning. To validate all stated, a bigger dataset is required.

## 4. CONCLUSION

This research, at the first, described a new dataset that was collected for analyzing the Serbian stock market and to investigate possible use of ML tools in forecasting of stock prices on BELEX. The benefit of this new dataset is not only for the ORCA-LAB project, but for others research that can provide some new inside of BELEX and to improve development level of Serbian Stock Market. In addition, it was shown that standard machine learning tools can provide forecast of stock prices with RMSE of 0.043 % in the best case. This must be taken with caution as small data can be insufficient for model training. Also, as it was mentioned in the introduction, with the development of Serbian Stock Market, it is expected that the stock price will be less influenced with some other factors, such as market sentiment. For future research additional data will be prepared as data for developed market such as United States of America and Germany, and then hyper parameter tuning will be undertaken together with use of some more advanced ML models for forecasting of stock prices.

**Table 3.** RMSE for full and reduced set of features.

MLmethod Dataset	No. of features	LR	LR_10	SVR	SVR_10	MLP	MLP_10
No_ratios_Q4	41	0.192	<b>0.043</b>	0.260	0.356	0.169	0.178
No_ratios_1Year	50	0.182	0.184	0.150	0.215	0.270	0.177
Ratios_Q4	313	0.172	0.077	0.064	0.074	0.158	0.138
Ratios_1Year	322	0.188	<b>0.081</b>	0.065	0.087	0.143	0.108

Source: Author's calculations on the basis of dataset described into the Methodology chapter.

**Table 4.** Set of features that contain most of the information for each database when differentiated values were calculated. The maximum number of features was set to 10.

Dataset Feature	No_ratios_Q4	No_ratios_1Year	Ratios_Q4	Ratios_1Year
Feature 1	Unemployment rate	Change in AVG price July-June	AOP0047	AOP0047
Feature 2	CV SMA 50	Change in AVG price Mar-Feb	AOP0056	AOP0056
Feature 3	STDEV SMA 50	Unemployment rate	AOP0068	AOP0068
Feature 4	CV TVT	CV SMA 50	AOP0417	AOP0417
Feature 5	MAX TVT	STDEV SMA 50	AOP0418	AOP0418
Feature 6	AVG TVT	CV TVT	AOP1020	AOP1020
Feature 7	MAX BBUP 50	MAX BBUP 50	AOP1021	AOP1021
Feature 8	CV SMA 10	CV SMA 10	AOP3004	AOP3004
Feature 9	STDEV SMA 10	STDEV SMA 10	AOP3033	AOP3033
Feature 10	MAX BBUP 10	MAX BBUP 10	AOP3034	AOP3034

Source: Author's calculations on the basis of dataset described into the Methodology chapter.





In additional conclusion is that further development of Serbian capital market should be supported by effective and efficient administrative procedures and accompanied activities in order to speed up process of issuing securities, in order to increase volume of trading. Furthermore, permanent financial education of all population should be implemented. Moreover, good business practices should be shared in order to attract new investors on Serbian stock market.

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## 6. LITERATURE

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# CONCEPTUAL MODEL OF A COMMUNITY-DRIVEN CIRCULAR SUPPLY CHAIN FOR BIOGAS PRODUCTION

Jelena Milovanović\*,  
Marija Jovanović,  
Gordana Dražić

Singidunum University,  
Belgrade, Serbia

## Abstract:

This research aimed to develop a specific replicating conceptual model for the establishment and maintenance of a circular supply chain for biogas production at the community level. The village Ilandža (Serbia) was selected to pilot the model, with four main goals: risks and benefits identification, spatial analysis, crops and by-products evaluation, and capacity building and sustainability. The research showed that a balanced application of *energy crops cultivation* and *by-product utilization* can result in biogas supply chain sustainability. Biogas production actions should be planned according to areas, energy crops, and by-products priority lists developed participatory. Entrepreneurs' capacities should be strengthened enough to implement such a comprehensive model. A monitoring system should be defined as participatory and should be applied during the implementation of each community-driven biogas project. Also, evaluation of strategies should be conducted after each project. All stakeholders must be informed of the importance of sustainable community-based entrepreneurship and actions.

## Keywords:

energy crops, marginal lands, by-products, risk identification, community awareness.

## 1. INTRODUCTION

A conceptual model is a tool for visually depicting the context within which a community project is operating and the major impacts on society and the environment. A well-developed model should link community goals to the main direct and indirect threats and benefits that can be turned into opportunities and provide the basis for defining strategy and specific actions (Margoluis et al., 2009; Amidžić, Veličković & Trkulja Vujičić, 2019; Chioatto & Sospiro, 2023). Circular supply chains are a very efficient model to address the problem of waste at the community level (Mukherjee, 2020). In the process of anaerobic digestion (AD), it is possible to convert energy from a wide range of biomass, including biodegradable waste, manure, sludge, biodegradable polymers, and biomass originating from agro-energy crops (De Meester et al., 2012). As a way out of the process, biogas, and the rest (digestate) appear. The digestate can be used as a biological fertilizer or as a top dressing, depending on the composition (which reflects the starting material and the design of the microbiological process and the reactor) (Nkoa, 2014). A large number of studies relate to improving the quality of marginal lands to enable acceptable yields of different crops and manage nutrient cycles in AD plants and their surroundings (Duan et al., 2018). The results vary, because of lands of different structures, climatic conditions, and crops, among which agro-energy crops should be considered. For example, *Sida hermaphrodita* on marginal soils has a significantly higher yield when digestate is applied (Nabel et al., 2017), and sorghum with adequate nitrogen supplementation on marginal soils achieves yields that are sustainable in the use of silage for biogas production (Ameen et al., 2017).

Correspondence:  
Jelena Milovanović

e-mail:  
jmilovanovic@singidunum.ac.rs



This research aimed to develop a specific replicating conceptual model for establishing and maintaining a circular supply chain for biogas production at the community level and to test it in a local community. The village of Ilandža in the municipality of Alibunar in Serbia was selected to pilot the developed conceptual model.

## 2. MATERIALS AND METHODS

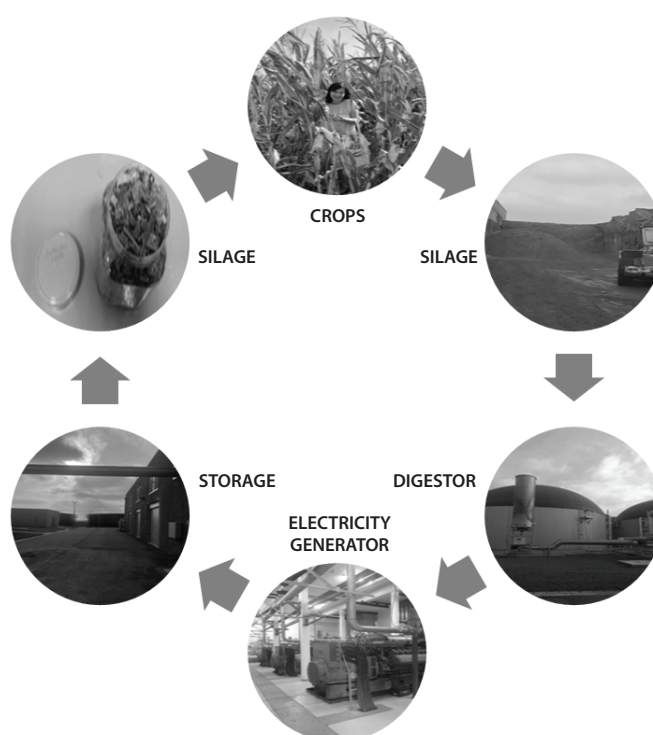
### 2.1. DEVELOPMENT OF A CONCEPTUAL MODEL

We used universal building components of a conceptual model, proposed by Margoluis et al. (1998, 2009) and adapted them for the needs of a specific community-based biogas project and the pilot locality. The first step was to determine the *scope* of the project which is related to the selected pilot area as well as conceptual targets. Brainstorming was done with the managers of the selected biogas power plant to define *direct threats* to their supply chain and the main *indirect threats/contributing factors* related to policy, social, and/or economic context. The parameters of the current situation defined the *opportunities* for improving the status by implementing the activities of the circular supply chain project.

### 2.2. DESCRIPTION OF THE PILOT AREA

Village Ilandža in the municipality of Alibunar (Serbia), was selected as an example of a local community exposed to environmental, social, and economic pressures. Here, the company Biogas Energy Alibunar owns 11.4 ha of construction land, including the power plant with ancillary facilities on 4.5 ha, and the land that they receive by right of first refusal based on infrastructure, with a total area of 204 ha. The total planned capacity of the power plant is 3 MW of electricity per year. Electricity is produced in three special GE Jenbacher plants, each with a total power of 999kW, as well as 3.6 MW of thermal energy per year, which can be converted into water vapor in a co-generation plant, with a total capacity of 2100 kg/h. In the AD process, 80,000 tons of raw materials are used. For the planned production of biogas, it is necessary to provide a maximum of 40% of raw material from silage. In the AD process, digestate is formed as a by-product, about 16,000 tons per year. The digestate from the digester goes to the separator, where the liquid and solid are separated. Liquid digestate is stored in special tanks until the export to agricultural plots. Solids can be dumped on agricultural land, spread using manure spreading trailers, and liquid using trailers or watering systems on sown crops on the plot (Figure 1). An additional 480 ha of agricultural land, as well as the part of the irrigation system covering 400 ha of land, are used for their own production of substrates used in the biogas power plant. Also, the company receives raw materials from subcontractors from an area of 1 100 ha.

Figure 1. The production process in the biogas power plant in Ilandža.





## 2.3. DESK RESEARCH AND FIELDWORK

Desk research included the collection of all data on the pilot locality and biogas facility. Fieldwork included identification and spatial definition of marginal lands suitable for energy crops cultivation in Serbia, experiments to assess productivity and potentials for biogas production of different energy crops, and experiments to assess the effects of by-products on the cultivation of different crops.

## 3. RESULTS AND DISCUSSION

### 3.1. CONCEPTUAL MODEL OF A CIRCULAR SUPPLY CHAIN FOR BIOGAS PRODUCTION

The community-driven circular supply chain for biogas production, developed on the example of village Ilandža, is shown in Figure 2. Here, we opted to place *a circular supply chain* as the scope of the conceptual model.

The conceptual model emphasizes four main goals:

**Goal 1 (Risks & Benefits Identification):** Participatory identification and prioritization of all risks and benefits related to biogas production in the village. The indispensable contributors to this goal are policymakers, scientists, managers/entrepreneurs, and all other stakeholders. A set of actions, within the strategy titled *Priority Risks & Benefits*, included several participatory workshops, reporting on threats and opportunities identified by stakeholders, and priority lists of pressures/risks and opportunities/benefits.

**Goal 2 (Spatial Analysis):** Scientific approach to availability and productivity of existing land sources and identification of possible tools to alternative risk management scenarios. The main strategy to fulfill this goal was to define *Priority Areas* for energy crops cultivation. The main output was an overview and a map of marginal lands prioritized according to the risk criteria. This step was implemented by scientists with the support of managers/landowners or users during the field survey.

**Goal 3 (Crops and By-Products Evaluation):** Prioritization of energy crops suitable for cultivation on spatially defined marginal lands, assessment of by-product effects on energy crops production to be able to achieve higher yields, and establishment of a consistent monitoring system based on measurable indicators and verifiers. A strategy titled *Priority Crops & By-Products* included: a priority list of energy crops; identification of by-products and their effects on crops cultivation; development of replicable guidelines for a biogas circular supply chain to be maintained; and establishment of a monitoring system.

**Goal 4 (Capacity Building & Sustainability):** The final goal within the model should ensure the sustainability of the whole scope and all previously implemented actions. For community-driven projects to take root, they need to be embraced by stakeholders, through participatory workshops and discussions. This step involves all participants, from community decision makers, through scientists, managers/entrepreneurs, to all stakeholders. Strengthening the capacities of managers/entrepreneurs for the implementation of the conceptual model is necessary as well as the definition of evaluation criteria for proposed actions.

Figure 2. Conceptual model of a community-driven circular supply chain for biogas production piloted in Ilandža.







The following project activities that contribute to the strategies defined within the model have been identified:

#### *Priority Risks & Benefits*

1. Participatory workshops for risks and benefits identification and prioritization.
2. A report on risks and benefits identification.
3. A list of priority risks to be addressed and benefits to be exploited.

#### *Priority Areas*

4. Field survey and identification of marginal lands.
5. Assessment of the degree of endangerment of identified areas/risk criteria assessment.
6. An overview of priority areas for energy crops cultivation.
7. Spatial definition and mapping of the priority localities.

#### *Priority Crops & By-Products*

8. Prioritization of energy crops suitable for cultivation on spatially defined marginal lands.
9. An assessment of by-products effects on energy crops production.
10. Development of replicable guidelines for a biogas circular supply chain based on the model.
11. Establishment of a monitoring system.

#### *Priority Community Actions*

12. Participatory elaboration and acceptance of the proposed conceptual model.
13. Strengthening the capacities of managers/entrepreneurs.
14. A well-structured public awareness campaign.
15. Definition of evaluation criteria.

### 3.2. APPLICATION OF THE CONCEPTUAL MODEL IN SERBIA

The application of the conceptual model in the village of Ilandža enabled the establishment of a sustainable project.

#### *Goal 1 (Risks & Benefits Identification)*

The participatory approach mapped a significant number of pressures and threats to the sustainability of community development as well as to biogas production. Risk prioritization (7 priorities) was performed as follows:

1. depopulation (village-town migration)
2. lack of rural economy diversification
3. no completed value chain for biogas production
4. declining soil quality for agriculture
5. unsustainable biomass yields
6. natural disasters
7. climate change

Depopulation was recognized as the risk of the first priority. It is most rational to produce biomass on marginal lands, which are located near biogas power plants, where it is necessary to apply additional measures to achieve sustainable yields. In this way, the value chain at the community level is completed, the lack of which is recognized as the third priority risk. Soil shows poorer production capacities, which is a consequence of the long-term inadequate management that has led to the deterioration of physical, chemical, and biological characteristics, recognized as the fourth priority risk. A power plant must have a constant inflow of biomass to function sustainably. It is necessary to provide sufficient quantities of energy crops, produced on marginal lands, which is often not feasible. Unsustainable biomass yields are identified as the fifth priority risk. The danger of natural disasters is a consequence of climate change, both of which have been identified as the sixth and seventh priority risks.

Also, a significant number of benefits have been identified. Environmental benefits include reduced greenhouse gas emissions, as the methane is used as biogas in the power plant, and improvement of the production capabilities of degraded lands. Social benefits are mitigation of climate change using renewable energy sources. Economic benefits are related to the fact that mineral fertilizer necessary for biomass production is substituted by a by-product from their own production, the possibility of placing digestate to subcontractors while avoiding long-term storage, and a production chain is established on the nearest land.

#### *Goal 2 (Spatial Analysis)*

Degraded land suitable for biofuel production is formed through very intensive agricultural activities or chemical pollution. Crop production is not possible on this land and there is an opportunity for energy crops cultivation. An added value is soil remediation. Additional potential localities for biofuel production are wastelands (Milovanović et al., 2012) and surface exploitation areas which should be re-naturalized.

Identification of marginal land for energy crops cultivation is a challenge due to insufficient data and unclear definitions of land categories. Within this goal, we identified and quantified marginal lands in Serbia and prioritized them according to the risk criteria. The most important areas for growing energy crops are categorized as unused agricultural land which covers over 420 000 ha. This land is most often not used due to decreased soil fertility or contamination. The categorization included three degrees of fertility degradation: optimal fertility (no reduction of fertility parameters), reduced fertility (one fertility parameter reduced), and degraded (more than one fertility parameter reduced). Three classes of soil have also been established depending on the degree of contamination:



none, one, or more than one parameter above the permitted limit. In addition to unused agricultural land, energy crops can be grown on about 11,000 ha of degraded land due to surface exploitation and on about 1,500 ha of ash dumps. The total area of marginal land, suitable for growing energy crops, is about 436 500 ha in the whole of Serbia (Radojević et al., 2015).

In the case of the province Vojvodina, where the village of Ilandža is located, marginal land belongs to the category of unused agricultural land. Prioritization of areas available for energy crops cultivation (7 priorities) was performed as follows:

1. Contaminated agricultural land (more than one parameter above the permitted limit).
2. Contaminated agricultural land (one parameter above the permitted limit).
3. Surface exploitation land located in Vojvodina (e.g., Kovin which is closest to the village).
4. Abandoned and degraded agricultural land (more than one fertility parameter reduced).
5. Abandoned agricultural land with reduced soil fertility (one fertility parameter reduced).
6. Ash dumps closest to the village (e.g., Obrenovac, Kostolac, and Kolubara).
7. Abandoned agricultural land of optimal fertility (in case there are no other options).

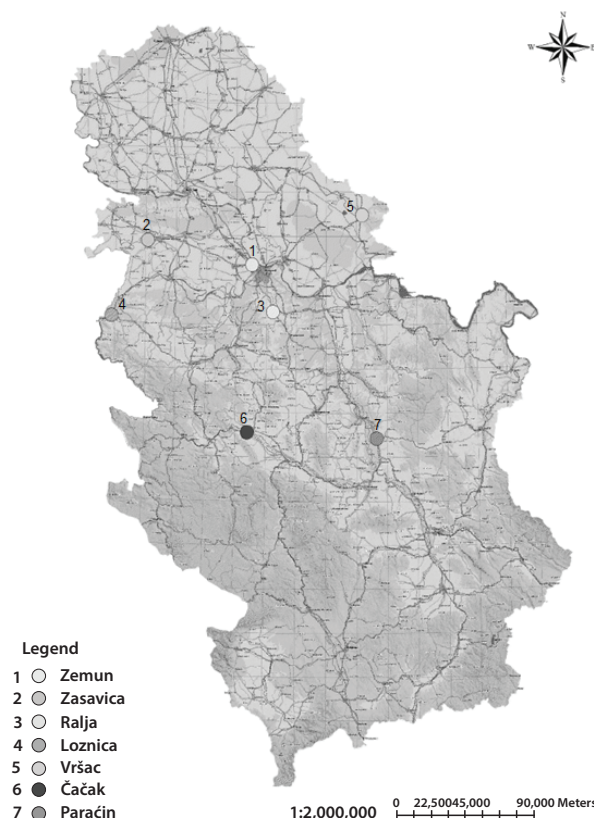
### Goal 3 (Crops and By-Products Evaluation)

In accordance with the list of priorities of marginal lands, experimental research was conducted to assess the productivity of different energy crops and their ability to remediate degraded and contaminated soils. Productivity and adaptability of the energy crop *Miscanthus × giganteus* Greef et Deu has been researched in Serbia for more than 14 years (Dražić et al., 2010; Jureková & Dražić, 2011; Milovanović et al., 2012; Arandelović et al., 2014; Dražić, Milovanović & Arandelović, 2014; Marišová, Milovanović & Djordjević, 2016; Dražić et al., 2018; Milovanović, Radojević & Šijačić-Nikolić, 2017) (Figure 3), showing that the production of this energy crop is possible.

In field conditions, the expected quality of biomass was obtained in terms of the content of relevant elements, moisture, and energy values. It has been shown that in the conditions of the field experiments during the development of miscanthus, significant recycling of the relevant elements occurred, and yields showed the expected values, while in some extreme conditions, the production of miscanthus biomass was not possible.

The energy efficiency of miscanthus biomass production is strongly influenced by the method of cultivation on the energy consumption side and the achieved yields on the energy production side. In Serbia, optimal values of the energy balance can be easily achieved in seasons without extreme droughts.

Figure 3. Locations of *Miscanthus × giganteus* Greef et Deu experimental plots in Serbia.





The harvest should be done as late as possible, just before the beginning of the new vegetation cycle. Delaying the harvest accelerates the translocation of nutrients from aboveground parts into rhizomes, while fertilization provides a sufficient amount of nitrogen necessary for the next vegetation cycle. The cycle is repeated on the same plot for up to 20 years. The advantage of miscanthus compared to other raw materials is that it can be grown on contaminated or degraded land, with the potential for bioremediation of contaminated soil and water.

The second energy crop, researched in Serbia for many years, is *Sorghum bicolor* L. The most important segment of the research, from the aspect of the development of the circular supply chain for the production of biogas, is the examination of the effects of by-products on the production of energy crops. The effects of digestate from the AD process application were investigated for the production of sorghum and corn. The results of the experimental research were presented to the local community and the prioritization of energy crops and by-products for the needs of the functioning of the circular supply chain (5 priorities) in the village of Ilandža was performed as follows:

1. Cultivation of miscanthus and sorghum on contaminated agricultural land by applying digestate.
2. Cultivation of miscanthus and sorghum on surface exploitation land by applying digestate.
3. Cultivation of miscanthus and sorghum on ash dumps by applying digestate.
4. Cultivation of miscanthus and sorghum on degraded agricultural land by applying digestate.
5. Cultivation of miscanthus and sorghum on land with reduced soil fertility by applying digestate.

Defining replicable guidelines for a community-driven circular supply chain for biogas production was a very important action within the conceptual model. The guidelines contain a comprehensive monitoring system.

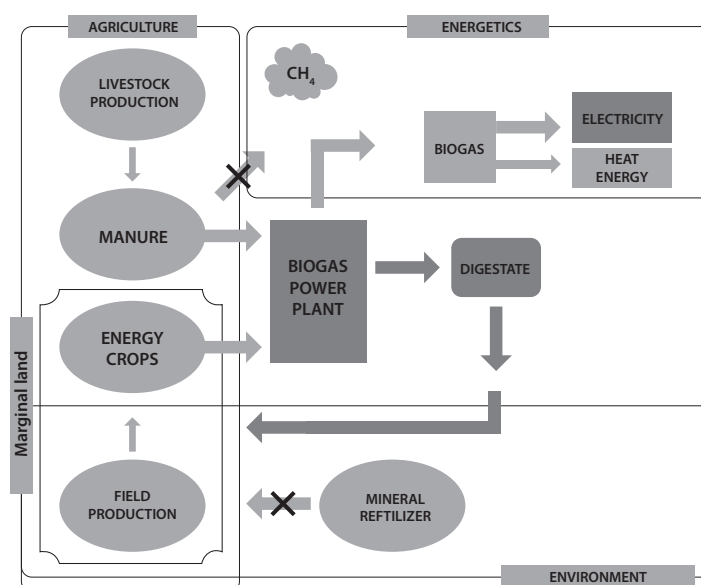
#### Goal 4 (Capacity Building & Sustainability)

Based on the participatory prioritization of marginal areas, energy crops, and by-products, a circular supply chain for the power plant in the village of Ilandža was developed and accepted by the local community (Figure 4).

Biomass from energy crops is a necessary raw material for the AD process because manure does not have satisfactory energy characteristics (Scarlat et al., 2018). It is most rational to produce this biomass on marginal lands (Cervelli, Scotto di Perta & Pindozi, 2020), which are located near biogas power plants. As such lands have poorer production capabilities, it is necessary to apply additional measures to achieve sustainable yields. As a by-product of the AD process, digestate is formed, which can be used to improve the characteristics of marginal soils and the production of energy crops. In this way, a circular supply chain is created, which engages the entire local community and creates the preconditions for sustainable rural development.

The acceptance of the proposed supply chain and changes in the community management by stakeholders was the priority. A series of participatory workshops for presenting the conceptual model and the supply chain have been organized and the impact of the proposed actions on the daily activities of the local community and other stakeholders were estimated. The conceptual model envisages an awareness-raising strategy to disseminate information on the circular supply chain, as well as to prevent inadequate decisions by policymakers. A well-structured media campaign was established, followed by the printing and distribution of information packages.

**Figure 4.** Community-driven circular supply chain for biogas production in the village of Ilandža.





To prevent untimely and unprofessional reactions to pressures, it was necessary to develop a comprehensive system of monitoring and evaluation of the community-driven biogas project. The presented conceptual model was a basic tool for defining indicators for monitoring and evaluation. The conceptual model envisages the development of a program for strengthening the capacities of managers/entrepreneurs for the implementation of the model and manages the process by sustainability principles.

#### 4. CONCLUSION

The main messages of the conceptual model were as follows:

- Only a balanced application of two approaches, 1) energy crops cultivation and 2) by-products utilization, can result in biogas supply chain sustainability on a community level.
- Biogas production actions should be planned according to areas, energy crops, and by-products priority lists developed participatory, combining desk research, field surveys, and stakeholders' attitudes.
- Managers'/entrepreneurs' capacities should be strengthened to be able to implement such a comprehensive conceptual model.
- A monitoring system should be defined as participatory and applied during the implementation of each community-based biogas project.
- An evaluation of strategies and actions should be conducted after each project with the aim of proposing their redefinition.
- All stakeholders must be informed on the importance of sustainable community-based entrepreneurship, and the planned and applied actions, providing indispensable inputs to the process.

#### 5. ACKNOWLEDGMENTS

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