



# Proceedings of the Faculty of Economics in East Sarajevo

*Journal of Economics and Business*

---

Зборник радова Економског факултета  
у Источном Сарајеву

*Часопис за економску теорију и праксу*

Issue 31  
**2025**

ISSN 1840-3557 eISSN 1986-6690

[zrefis.ekofis.ues.rs.ba](http://zrefis.ekofis.ues.rs.ba)

УНИВЕРЗИТЕТ У ИСТОЧНОМ САРАЈЕВУ  
ЕКОНОМСКИ ФАКУЛТЕТ



UNIVERSITY OF EAST SARAJEVO  
FACULTY OF ECONOMICS



St. Aleksa Šantić 3, 71420 Pale  
Republic of Srpska, BiH

+387 57 226 651 / dekanat@ekofis.ues.rs.ba



f **EkonomskiFakultetPale**

ig **ekofis.ues**

***ekofis.ues.rs.ba***

**Published by:**

University of East Sarajevo  
 Faculty of Economics  
 Alekse Šantića 3, 71420 Pale  
 Bosnia and Herzegovina  
 ☎ +387 57 226 651  
 ✉ [dekanat@ekofis.ues.rs.ba](mailto:dekanat@ekofis.ues.rs.ba)  
<https://www.ekofis.ues.rs.ba>

**For the Publisher:**

Mladen Rebić, PhD Full Prof.  
 Dean

**Editor-in-Chief:**

Nemanja Šarenac, PhD Assoc. Prof.  
 ✉ [zrefis@ekofis.ues.rs.ba](mailto:zrefis@ekofis.ues.rs.ba)

**Editorial Board:**

Tihomir Spremo, PhD, Faculty of Economics Pale  
 Nemanja Šarenac, PhD, Faculty of Economics Pale  
 Borka Popović, PhD, Faculty of Economics Pale  
 Slađana Paunović, PhD, Faculty of Economics Pale  
 Goran Balotić, PhD, Faculty of Economics Pale  
 Damjan Danilović, PhD, Faculty of Economics Pale  
 Dajana Kovačević, MA, Faculty of Economics Pale  
 Nevena Kapor, MA, Faculty of Economics Pale  
 Nataša Kandić, MA Faculty of Economics Pale

**International Editorial Board:**

Tahir Mahmutefendić, PhD, High School in East London, United Kingdom  
 Zoltan Barcskai, PhD, Széchenyi István University, Győr, Hungary  
 Branka Likić-Brborić, PhD, Linköping University, Sweden  
 Radovan Kovačević, PhD, University of Belgrade, Serbia  
 Miloško Arsić, PhD, University of Belgrade, Serbia  
 Bojan Zečević, PhD, University of Belgrade, Serbia  
 Jolán Velencei, PhD, Óbuda University, Budapest, Hungary  
 Boda György, PhD, Corvinus University of Budapest, Hungary  
 Teoman Duman, PhD, Epoka University, Tirana, Albania  
 Gerd Wassenberg, PhD, RWTH Aachen University, Germany  
 Vladimir Kaščelan, PhD, University of Montenegro, Montenegro  
 Božo Mihailović, PhD, University of Montenegro, Montenegro  
 Diana Antonova, PhD, University of Ruse Angel Kanchev, Ruse, Bulgaria  
 Svilen Kunev, PhD, University of Ruse Angel Kanchev, Ruse, Bulgaria  
 Adrian Tantau, PhD, Bucharest University of Economic Studies, Romania  
 Jaka Vadrjal, PhD, Gea College Ljubljana, Slovenia  
 Predrag Trpeski, PhD, Ss. Cyril and Methodius University, North Macedonia  
 Neven Šerić, PhD, University of Split, Croatia  
 Ljubica Knježević Cvelbar, PhD, University of Ljubljana, Slovenia  
 Mirjana Pejić Bach, PhD, University of Zagreb, Croatia  
 Metod Šuligoj, PhD, University of Primorska, Slovenia

**Proofreader for English language:**

Anja Đuranović, MSc

**Abstracted and indexed in:**

*The Journal is indexed in ERIH Plus, Bergen, Norway; Sherpa Romeo – JISC, United Kingdom; DOAJ - Directory of Open Access Journals, Hovedstaden, Denmark; ProQuest, Ann Arbor, Michigan, U.S.; Google Scholar; EBSCO Publishing, Ipswich; INDEX COPERNICUS International, Warsaw, Poland; CABELL'S Directories (Cabell's Directories of Publishing Opportunities), Texas, USA; C.E.E.O.L (Central and Eastern European Online Library), Frankfurt am Main, Germany; BASE (BASE – Bielefeld Academic Search Engine), Bielefeld University Library, Germany; JEL (Journal of Economic Literature) / EconLite, (American Economic Association's Electronic Database), Pittsburgh, USA; DOI Srpska, Banja Luka; CrossRef, Oxford, United Kingdom.*

Proceedings is issued semiannually.

**Printed by:**

„Kopikomerc“ s.z.r. Istočno Novo Sarajevo

**Copies:**

100

ISSN: 1840-3557 e-ISSN: 1986-6690 UDC: 330.1 COBISS. RS-ID: 16736262 COBISS. BH-ID: 16736262  
 DOI: <https://doisrpska.nub.rs/index.php/zrefis/issue/archive>

**Address of the Editorial Board:**

*Proceedings of the Faculty of Economics in East Sarajevo*  
 Alekse Šantića 3, 71420 Pale  
 Bosnia and Herzegovina  
 ☎ +387 57 226 651 ext. 410  
 ✉ [zrefis@ekofis.ues.rs.ba](mailto:zrefis@ekofis.ues.rs.ba)  
[www.zrefis.ekofis.ues.rs.ba](http://www.zrefis.ekofis.ues.rs.ba)

This journal is open access - The journal's content is licensed under Creative Commons Attribution - NonCommercial - NoDerivs 4.0.



# **PROCEEDINGS OF THE FACULTY OF ECONOMICS IN EAST SARAJEVO**

---

**ЗБОРНИК РАДОВА ЕКОНОМСКОГ ФАКУЛТЕТА У ИСТОЧНОМ САРАЈЕВУ**

**Issue 31  
2025**



The journal is published with the financial support of  
the Ministry of Scientific and Technological Development and Higher Education  
in Government of the Republic of Srpska.

---

Часопис је публикован захваљујући финансијској подршци Министарства за  
научнотехнолошки развој и високо образовање у Влади Републике Српске

## Editor's note

*Dear scientists, readers and colleagues,,*

*I am delighted to introduce scientific journal „Proceedings of the Faculty of Economics in East Sarajevo” (Zbornik radova Ekonomskog fakulteta u Istočnom Sarajevu) one of the best journals in Republic of Srpska and Bosnia and Herzegovina in the area of economics and business. The journal was, according to the Ministry of Scientific and Technological Development, Higher Education and Information Society Republic of Srpska, won 34 out of a possible 40 points, and thus classified in the first category of scientific journals. The Journal is indexed in ERIH Plus, Bergen, Norway; Sherpa Romeo – JISC, United Kingdom; DOAJ - Directory of Open Access Journals, Hovedstaden, Denmark; ProQuest, Ann Arbor, Michigan, U.S.; Google Scholar; EBSCO Publishing, Ipswich; INDEX COPERNICUS International, Warsaw, Poland; CABELL'S Directories (Cabell's Directories of Publishing Opportunities), Texas, USA; C.E.E.O.L (Central and Eastern European Online Library), Frankfurt am Main, Germany; BASE (BASE – Bielefeld Academic Search Engine), Bielefeld University Library, Germany; JEL (Journal of Economic Literature) / EconLite, (American Economic Association's Electronic Database), Pitsburg, USA; DOI Srpska, Banja Luka; CrossRef, Oxford, United Kingdom.*

*This issue contains selected articles presented at the Intenational Scientific Conference "Jahorina business forum" held at Faculty of Economics Pale on May 27<sup>th</sup> – 29<sup>th</sup>, 2025. It is very important to stress out that, besides the appropriate level of quality of scientific papers received, the Editorial Board had an additional criteria in the process of selecting papers. The focus was on papers the content of which could contribute to the theory and practice of local economic development in general.*

*This issue of the scientific journal brings together a selection of papers that critically examine key transformations shaping today's economies – ranging from human capital development and artificial intelligence to fiscal modernization, migration flows, and the digital economy. The contributing authors, representing diverse academic environments and research traditions, explore how economic systems in transitional and emerging regions respond to global technological, demographic, and institutional shifts. Several contributions address the interface between technology and the labor market. The paper on higher education in North Macedonia analyzes the determinants of job satisfaction and professional development, highlighting the role of institutional support and AI integration in academia. The study comparing Nigeria and the United Kingdom investigates how artificial intelligence is redefining skill structures in the banking sector, exposing the inequalities in infrastructure, education, and ethical governance that shape digital transformation. In turn, the research focused on Albania explores the implications of electronic billing and fiscalization for business efficiency and tax compliance, showing that while transparency improves, smaller enterprises bear disproportionate adjustment costs. Demographic and regional dimensions are captured through an analysis of labor migration in Southeast Europe, emphasizing how coordinated migration policies can transform structural challenges into developmental opportunities. The issue concludes with a comparative study of digital economy development across the Western Balkans, offering a nuanced assessment of Bosnia and Herzegovina's position within the regional digital landscape and its prospects for*

*stronger integration into the European digital market. Taken together, these studies reveal how innovation, migration, fiscal reform, and digital inclusion intertwine in shaping the new architecture of economic growth and institutional resilience.*

*The papers refer to the broad area of economic science, and their main prerequisites are scientific contributions to economic theory and practice. The papers can be of theoretical and methodological-analytical nature, and may include areas ranging from national economic policies to business policy. Manuscripts are written in English language. Needless to say, any papers that you wish to submit, either individually or collaboratively, are much appreciated and will make a substantial contribution to the early development and success of the journal. Best wishes and thank you in advance for your contribution to the scientific journal „Proceedings of the Faculty of Economics in East Sarajevo”.*

***Editor-in-Chief***  
***Dr Nemanja Šarenac***  
*Associate Professor*

# CONTENTS

|                      |   |
|----------------------|---|
| <i>Editor's Note</i> | 5 |
|----------------------|---|

## **PRELIMINARY COMMUNICATION**

---

|                                                                                                                        |    |
|------------------------------------------------------------------------------------------------------------------------|----|
| FACTORS INFLUENCING JOB SATISFACTION AND HUMAN CAPITAL DEVELOPMENT AMONG HIGHER EDUCATION EMPLOYEES IN NORTH MACEDONIA | 23 |
| <i>Marijana Cvetanoska, Predrag Trpeski and Andrijana Ristovska</i>                                                    |    |

## **REVIEW PAPERS**

---

|                                                                                                                                              |    |
|----------------------------------------------------------------------------------------------------------------------------------------------|----|
| COMPARATIVE ANALYSIS OF THE IMPORTANCE OF ARTIFICIAL INTELLIGENCE IN ADDRESSING SKILL GAPS IN COMMERCIAL BANKS IN NIGERIA AND UNITED KINGDOM | 23 |
| <i>Oluwatoba Oyedele Adeniwura, Anu Keshiro Toriola, Gbenro Mathew Sokunb and Dorothy Omogbohun Ndubueze</i>                                 |    |

|                                                                                                                                           |    |
|-------------------------------------------------------------------------------------------------------------------------------------------|----|
| EVALUATING THE EFFECTS OF ELECTRONIC BILLING AND FISCALIZATION ON BUSINESS EFFICIENCY AND TAX COMPLIANCE: A STUDY OF ALBANIAN ENTERPRISES | 33 |
| <i>Erjola Barbullushi and Albana Kastrati</i>                                                                                             |    |

|                                                                                                                  |    |
|------------------------------------------------------------------------------------------------------------------|----|
| LABOUR MIGRATION: CHALLENGE OR OPPORTUNITY FOR THE DEMOGRAPHIC FUTURE AND ECONOMIC STABILITY OF SOUTHEAST EUROPE | 47 |
| <i>Milan Lubura</i>                                                                                              |    |

|                                                                   |    |
|-------------------------------------------------------------------|----|
| COMPARATIVE ANALYSIS OF DIGITAL ECONOMY DEVELOPMENT IN THE REGION | 59 |
| <i>Jelena Unković</i>                                             |    |

|                                         |    |
|-----------------------------------------|----|
| <b><i>BRIEFLY ABOUT THE JOURNAL</i></b> | 71 |
|-----------------------------------------|----|

|                                        |    |
|----------------------------------------|----|
| <b><i>INSTRUCTIONS FOR AUTHORS</i></b> | 73 |
|----------------------------------------|----|



# PRELIMINARY COMMUNICATION



**Marijana Cvetanoska**

Faculty of Economics Skopje,  
University "Ss. Cyril and  
Methodius" in Skopje,  
North Macedonia

✉ marijana.cvetanoska@eccf.ukim.edu.mk

**Predrag Trpeski**

Faculty of Economics Skopje,  
University "Ss. Cyril and  
Methodius" in Skopje,  
North Macedonia

✉ predrag.trpeski@eccf.ukim.edu.mk

**Andrijana Ristovska**

National Bank of the Republic  
of North Macedonia,  
Skopje,  
North Macedonia

✉ RistovskaA@nbrm.mk

## FACTORS INFLUENCING JOB SATISFACTION AND HUMAN CAPITAL DEVELOPMENT AMONG HIGHER EDUCATION EMPLOYEES IN NORTH MACEDONIA

### ФАКТОРИ КОЈИ УТИЧУ НА ЗАДОВОЉСТВО ПОСЛОМ И РАЗВОЈ ЉУДСКОГ КАПИТАЛА МЕЃУ ЗАПОСЛЕНИМ У ВИСОКОМ ОБРАЗОВАЊУ У СЕВЕРНОЈ МАКЕДОНИЈИ

**Summary:** Employee job satisfaction and the continuous development of knowledge, skills, and abilities are essential for retaining talent in higher education institutions. This paper examines the factors influencing job satisfaction and those contributing to human capital development among higher education employees in North Macedonia. Based on a sample of 120 employees from diverse academic fields, roles, and levels of experience, the study identifies key determinants of job satisfaction, including institutional recognition and respect, salary, autonomy, and managerial support in fostering a healthy work environment. Regarding human capital development, the most influential factors include work-life balance, opportunities for professional growth, and financial resources provided by the institution. Additionally, the study explores employees' perspectives on artificial intelligence (AI) in academia, highlighting its perceived positive impact on teaching and research. However, findings indicate that faculties in North Macedonia allocate insufficient resources for AI training and integration. The study emphasizes the need for strategic investment in employee development and technological support to enhance academic performance and job satisfaction.

**Keywords:** AI, higher education, human capital development, job satisfaction, North Macedonia

**JEL Classification:** I23, I25, O15

**Резиме:** Задовољство послом запослених и континуирани развој знања, вештина и способности су неопходни за задржавање талената у високошколским установама. Овај рад истражује факторе који утичу на задовољство послом и оне који доприносе развоју људског капитала међу запосленима у високом образовању у Северној Македонији. На основу узорка од 120 запослених из различитих академских области, улога и нивоа искуства, студија идентификује кључне детерминанте задовољства послом, укључујући институционално признање и поштовање, плату, аутономију и менаџерску подршку унеговању здравог радног окружења. Што се тиче развоја људског капитала, најутицајнији фактори су равнотежа између пословног и приватног живота, могућности за професионални раст и финансијска средства која институција обезбеђује. Поред тога, студија истражује перспективе запослених о вештачкој интелигенцији (AI) у академским круговима, наглашавајући њен уочени позитиван утицај на наставу и истраживање. Међутим, налази указују да факултети у Северној Македонији издвајају недовољне ресурсе за обуку и интеграцију вештачке интелигенције. Студија наглашава потребу за стратешким улагањем у развој запослених и технолошку подршку како би се побољшао академски учинак и задовољство послом.

**Кључне ријечи:** вештачка интелигенција, високо образовање, развој људског капитала, задовољство послом, Северна Македонија

**ЈЕЛ класификација:** I23, I25, O15

Paper presented at the 14<sup>th</sup> International Scientific Conference "Jahorina Business Forum 2025:  
Industry 4.0 - Challenges in Management, Digital Trends and Use of Artificial Intelligence"

## INTRODUCTION

In today's dynamic and competitive global environment, the success of organizations and institutions largely depends on their ability to adapt to constant changes and challenges. One of the key determinants of an organization's success is the motivation and engagement of its workforce. Motivated employees contribute to higher productivity and better performance. Therefore, understanding the factors that drive employee motivation has become a crucial aspect of modern strategic practices.

In the modern knowledge-based economy, human capital development has become a crucial element for organizations aiming to maintain competitiveness and ensure sustainable growth. Higher education institutions, in particular, rely heavily on the skills, expertise, and motivation of their academic staff. Effective human resource management (HRM) practices are essential for attracting, retaining, and developing talented professionals in this sector.

Human capital development encompasses a broad range of factors that contribute to improving employees' capabilities, performance, and commitment. Motivation, training, empowerment, teamwork, and a positive organizational culture are among the most critical aspects influencing human capital development.

While numerous studies have explored the role of job satisfaction in employee performance, empirical research on human capital development in the higher education sector, particularly in developing countries such as North Macedonia, remains limited. To effectively fulfill their responsibilities in teaching, research, and community engagement, universities require a well-qualified and highly motivated academic staff. Public higher education institutions often face challenges such as inadequate financial incentives, lack of career growth opportunities, and bureaucratic inefficiencies that may lead to employee dissatisfaction and reduced motivation (Mahazril et al. 2012).

This paper aims to address the following key research questions:

- *What are the key factors influencing job satisfaction among higher education employees in North Macedonia?*
- *What are the primary drivers of human capital development among higher education employees in North Macedonia?*
- *What strategies can be implemented to enhance job satisfaction and foster human capital development within the higher education sector?*

Job satisfaction and human capital development are critical factors influencing the success and sustainability of higher education institutions. Understanding the needs and expectations of academic staff is essential for fostering a positive work environment, improving job satisfaction, and enhancing institutional performance. By implementing effective HRM strategies - such as continuous professional development, empowerment initiatives, and incentive programs - higher education institutions can create a more motivated and committed workforce, ultimately contributing to long-term growth and success.

The paper is structured as follows: following the introduction, the second section offers a literature review on the factors influencing job satisfaction and human capital development, also in the context of higher education. The third section details the research methodology, including the sampling process and the quantitative analysis of the survey data. The fourth section presents the results and findings, focusing on job satisfaction and human capital development within higher education institutions. Finally, the conclusion synthesizes the key insights and provides actionable recommendations for enhancing employee motivation and retention in the higher education sector.

## 1. LITERATURE REVIEW

Human capital development and job satisfaction are essential in shaping organizational outcomes, influencing both employee behavior and organizational productivity. Numerous theoretical frameworks have been developed to explain the determinants of job satisfaction, with Frederick Herzberg's (1959) Two-Factor Theory being one of the most influential. Herzberg's theory distinguishes between hygiene factors (e.g., salary, working conditions) and motivational factors (e.g., achievement, recognition), arguing that while hygiene factors prevent dissatisfaction, motivational factors are the key drivers of job satisfaction.

The relationship between economic factors and job satisfaction has been well documented. Blanes i Vidal and Nossol (2011) found that wages, opportunities for advancement, and managerial practices are critical in fostering job satisfaction. Their research indicates that employees' sense of satisfaction and motivation is strongly linked to the recognition of their efforts and the opportunities they receive for professional growth. Markham et al. (2002) and Kosfeld et al. (2017) further emphasize the importance of formal recognition programs (e.g., employee-of-the-month awards) in motivating employees and enhancing job satisfaction. These recognition practices contribute to a

positive work environment, reinforcing Herzberg's view that meaningful work and acknowledgment are essential for maintaining job satisfaction.

In addition to financial and recognition factors, workplace conditions significantly influence employee motivation and job satisfaction. Study by Mudor and Tooksoon (2011) identifies factors such as work schedules (fixed vs. flexible), teamwork, feedback, supervision, and training as important predictors of job satisfaction. Mudor and Tooksoon (2011) emphasize that a supportive work environment fosters higher engagement, leading to increased productivity and reduced absenteeism. Conversely, a lack of motivation can result in organizational inefficiencies such as high turnover rates and disengagement, suggesting the need for comprehensive strategies to enhance workplace conditions.

Empirical research has substantiated the link between motivation and job performance. Grant et al. (2008) conducted a field study on fundraising agents, demonstrating that enhancing employees' perception of task significance could double their productivity. This finding underscores the role of meaningful work and engagement in improving organizational performance. Hee et al. (2019) extended Herzberg's theory to the higher education sector, identifying both hygiene factors (e.g., salary, supervision) and motivators (e.g., recognition, career growth) as critical influences on job satisfaction among faculty members in Malaysian universities. They concluded that addressing these factors is vital for ensuring the quality of education and promoting positive student outcomes.

Research also explores job satisfaction in specific professions. Szromek and Wolniak (2020) investigated the satisfaction of researchers in Poland, revealing that their job satisfaction was influenced by employment conditions, the societal relevance of their research, and academic opportunities. Notably, satisfaction levels were higher when researchers focused on academic and didactic tasks, while administrative duties were seen as a detractor. This highlights the importance of aligning job roles with employees' intrinsic motivations and passions to enhance satisfaction.

Leadership also plays a crucial role in employee motivation. Hitka et al. (2019) explored the relationship between career aspirations and motivation factors, highlighting the role of innovative leadership in motivating highly educated employees. Their findings reveal a significant correlation between motivation and career expectations, suggesting that career aspirations are shaped by the leadership practices and the opportunities employees perceive in their roles.

Rezaei et al. (2021) examined the impact of knowledge management on organizational performance, finding that organizational structure, culture, leadership, and trust were the most significant predictors of effective knowledge management, which in turn boosted performance. Their study underscores the importance of optimizing human capital and organizational resources to maintain competitiveness.

Selesho and Naile (2014) focused on the retention of academic staff in South African universities, revealing that job satisfaction, career development, and academic opportunities were the primary drivers of retention. Poor working conditions, inadequate mentoring, and unclear promotion guidelines were identified as significant barriers. This highlights the need for universities to foster environments that promote career growth and employee satisfaction.

Further exploration into the role of Human Capital Management (HCM) in educational institutions is provided by Bucața and Tileaga (2023). Their study stresses the importance of strategic HCM in universities to attract and retain skilled staff. A positive work environment, professional development opportunities, and competitive remuneration were identified as key factors in improving academic staff retention and enhancing university performance. Aligning institutional goals with employees' needs can create a mutually beneficial dynamic, improving satisfaction and overall institutional effectiveness.

Lentjushenkova (2021) explores the factors influencing human capital development in higher education institutions (HEIs), emphasizing its critical role in institutional performance. Findings highlight that pedagogical and scientific competence of academic staff, industry professionals' involvement, and motivation are central to human capital development. Additionally, four primary influencing factors emerge: staff competence and motivation, legislation and strategic development, resource availability, and cooperation. These insights underscore the need for strategic investments in human capital to enhance competitiveness and institutional effectiveness in higher education.

About attitudes towards artificial intelligence, Vasiljeva, et. al (2021) emphasize that top management's attitude, competition, and regulations are primary drivers of AI adoption within organizations. They also note that attitudes toward AI vary significantly across industries, with a distinct divide between organizations that have implemented AI and those that have not.

Organizational commitment, competitive pressures, and regulatory factors are crucial in shaping AI integration. Complementing this, Dabbous, et al. (2022) focus on individual employees' intentions to use AI, identifying organizational culture, habit, job insecurity, perceived self-image, and perceived usefulness as key factors. Their findings reveal that positive organizational culture and habit enhance employees' intention to use AI, while job insecurity negatively impacts it. Moreover, perceived self-image and perceived usefulness mediate the relationships between job insecurity, habit, and AI adoption. Together, these studies underscore the importance of both organizational-level factors and individual perceptions in driving successful AI integration.

## 2. METHODOLOGY AND DATA

The aim of this paper is to evaluate the impact of several factors — such as recognition and respect, salary, autonomy, support from faculty management, work-life balance and support for professional development financial resources for professional development — on job satisfaction and human capital development among employees in higher education institutions in North Macedonia. Furthermore, the paper seeks to explore employees' attitudes toward the integration of artificial intelligence (AI) in academic work, including its perceived positive effects on teaching processes, as well as the availability of training and resources for AI implementation within these institutions.

To investigate the factors influencing job satisfaction and human capital development among higher education employees in North Macedonia, this study formulates and tests several hypotheses. These hypotheses explore the relationships between the independent variables (recognition and respect, salary, autonomy, support from faculty management, work-life balance and support for professional development financial resources for professional development) and the dependent variables (job satisfaction and human capital development). Additionally, the study examines the extent to which institutions invest in artificial intelligence (AI) training and integration. The hypotheses are structured into three main categories: job satisfaction, human capital development, and AI integration in academia.

### 2.1. Hypotheses on Job Satisfaction

The following hypotheses examine how different workplace factors influence employees' overall job satisfaction:

- *H<sub>01</sub>: There is no significant relationship between recognition and respect for employees' work by the institution and their job satisfaction in higher education institutions in North Macedonia.*
- *H<sub>11</sub>: There is a significant positive relationship between recognition and respect for employees' work by the institution and their job satisfaction in higher education institutions in North Macedonia.*
- 
- *H<sub>02</sub>: There is no significant relationship between salary and job satisfaction in higher education institutions in North Macedonia.*
- *H<sub>12</sub>: There is a significant positive relationship between salary and job satisfaction in higher education institutions in North Macedonia.*
- 
- *H<sub>03</sub>: There is no significant relationship between the level of autonomy employees have in their work and their job satisfaction in higher education institutions in North Macedonia.*
- *H<sub>13</sub>: There is a significant positive relationship between the level of autonomy employees have in their work and their job satisfaction in higher education institutions in North Macedonia.*
- 
- *H<sub>04</sub>: There is no significant relationship between the support from faculty management in fostering a healthy working environment and job satisfaction in higher education institutions in North Macedonia.*
- *H<sub>14</sub>: There is a significant positive relationship between the support from faculty management in fostering a healthy working environment and job satisfaction in higher education institutions in North Macedonia.*

## 2.2. Hypotheses on Human Capital Development

The next set of hypotheses investigate factors that influence the development of employees' knowledge, skills, and abilities:

- *H<sub>05</sub>: There is no significant relationship between the work-life balance and human capital development in higher education institutions in North Macedonia.*
- *H<sub>15</sub>: There is a significant positive relationship between work-life balance and human capital development in higher education institutions in North Macedonia.*
  
- *H<sub>06</sub>: There is no significant relationship between the support for professional development and human capital development in higher education institutions in North Macedonia.*
- *H<sub>16</sub>: There is a significant positive relationship between the support for professional development and human capital development in higher education institutions in North Macedonia.*
  
- *H<sub>07</sub>: There is no significant relationship between the financial resources provided by the institution for professional development and human capital development in higher education institutions in North Macedonia.*
- *H<sub>17</sub>: There is a significant positive relationship between the financial resources provided by the institution for professional development and human capital development in higher education institutions in North Macedonia.*

## 2.3. Hypotheses on AI Integration in Academia

The final hypothesis assesses the extent to which higher education institutions in North Macedonia allocate resources for AI training and implementation:

- *H<sub>08</sub>: Faculties in higher education institutions in North Macedonia do not allocate sufficient resources for the training and integration of artificial intelligence into academic work and teaching.*
- *H<sub>18</sub>: Faculties in higher education institutions in North Macedonia allocate sufficient resources for the training and integration of artificial intelligence into academic work and teaching.*

For the purposes of this paper, a questionnaire was administered to gather respondents' opinions and answers. Besides questions on factors influencing job satisfaction and human capital development, the questionnaire included demographic questions and questions about respondents' roles, level of experience in higher education institutions, and academic fields. Respondents rated the importance of the analyzed factors. Additionally, the questionnaire addressed employees' attitudes toward the application of artificial intelligence (AI) in academic work, its perceived positive impact on teaching processes, and the availability of training and resources for AI implementation in these institutions.

The target group consisted of professors, assistant professors, research fellows, and other employees in higher education institutions in North Macedonia, with a sample size of 120 respondents from various academic fields and with different lengths of service. This sample size and variety offer a comprehensive reflection of the phenomenon being studied.

The paper used simple linear regression and correlation analyses to examine the relationships between these factors and their impact on job satisfaction and human capital development. A descriptive analysis was also conducted to assess whether faculties in higher education institutions in North Macedonia allocate sufficient resources for training and integrating artificial intelligence (AI) into academic work and teaching. Data collection and analysis were conducted through an electronic survey service, Kwik Surveys.

### 3. RESULTS AND FINDINGS

The findings indicate strong positive relationships between job satisfaction and key organizational factors (Table 1). Recognition and respect for employees ( $r = 0.65$ ,  $\beta = 0.52$ ,  $p < 0.001$ ) significantly enhance job satisfaction, while salary ( $r = 0.58$ ,  $\beta = 0.45$ ,  $p < 0.01$ ) and autonomy ( $r = 0.62$ ,  $\beta = 0.50$ ,  $p < 0.001$ ) also contribute substantially. Faculty management support ( $r = 0.67$ ,  $\beta = 0.55$ ,  $p < 0.001$ ) is the strongest predictor of job satisfaction, emphasizing the importance of leadership.

Table 1. Pearson Correlation Results for Job Satisfaction

| Independent Variable            | Dependent Variable | Pearson r | p-value |
|---------------------------------|--------------------|-----------|---------|
| Recognition and Respect         | Job Satisfaction   | 0.65      | 0.0     |
| Salary                          | Job Satisfaction   | 0.58      | 0.001   |
| Autonomy                        | Job Satisfaction   | 0.62      | 0.0     |
| Support from Faculty Management | Job Satisfaction   | 0.67      | 0.0     |

Source: Authors' calculation based on SPSS Analysis, 2025

Regarding human capital development (Table 2), work-life balance ( $r = 0.55$ ,  $\beta = 0.40$ ,  $p < 0.01$ ) positively influences employees' ability to develop skills. Institutional support for professional growth ( $r = 0.60$ ,  $\beta = 0.47$ ,  $p < 0.01$ ) and financial resources for training ( $r = 0.53$ ,  $\beta = 0.39$ ,  $p < 0.01$ ) also play crucial roles.

Table 2. Pearson Correlation Results for Human Capital Development

| Independent Variable                             | Dependent Variable        | Pearson r | p-value |
|--------------------------------------------------|---------------------------|-----------|---------|
| Work-Life Balance                                | Human Capital Development | 0.55      | 0.002   |
| Support for Professional Development             | Human Capital Development | 0.6       | 0.001   |
| Financial Resources for Professional Development | Human Capital Development | 0.53      | 0.003   |

Source: Authors' calculation based on SPSS Analysis, 2025

The linear regression analysis (Table 3) shows that all analyzed factors have a statistically significant and positive impact on job satisfaction, with *support from faculty management* ( $\beta = 0.55$ ,  $R^2 = 0.45$ ) having the strongest influence, explaining 45% of the variance. *Recognition and Respect* ( $\beta = 0.52$ ,  $R^2 = 0.42$ ) also contributes significantly, accounting for 42% of the variance. *Autonomy* ( $\beta = 0.50$ ,  $R^2 = 0.38$ ) has a slightly lower but still significant impact, while *salary* ( $\beta = 0.45$ ,  $R^2 = 0.36$ ) has the weakest effect, explaining 36% of the variance in job satisfaction. Although all factors are important, the results indicate that support from faculty management and recognition and respect are the key predictors of satisfaction, whereas salary has the least impact, suggesting that financial compensation is not the most decisive factor for academic staff.

Table 3. Simple Linear Regression Results for Job Satisfaction

| Independent Variable            | Dependent Variable | Beta Coefficient ( $\beta$ ) | p-value | $R^2$ |
|---------------------------------|--------------------|------------------------------|---------|-------|
| Recognition and Respect         | Job Satisfaction   | 0.52                         | 0.0     | 0.42  |
| Salary                          | Job Satisfaction   | 0.45                         | 0.002   | 0.36  |
| Autonomy                        | Job Satisfaction   | 0.5                          | 0.0     | 0.38  |
| Support from Faculty Management | Job Satisfaction   | 0.55                         | 0.0     | 0.45  |

Source: Authors' calculation baes on SPSS Analysis, 2025

Table 4 indicates that all factors examined have a statistically significant and positive impact on human capital development. *Support for professional development* ( $\beta = 0.47$ ,  $R^2 = 0.34$ ) has the strongest influence, explaining 34% of the variance. *Work-Life balance* ( $\beta = 0.40$ ,  $R^2 = 0.30$ ) also plays an important role, accounting for 30% of the variance. *Financial resources for professional development* ( $\beta = 0.39$ ,  $R^2 = 0.28$ ) has the weakest but still significant effect, explaining 28% of the variance in human capital development. These findings suggest that professional development support is the most crucial factor, while financial resources, though relevant, have a comparatively lower impact.

Table 4. Simple Linear Regression Results for Human Capital Development

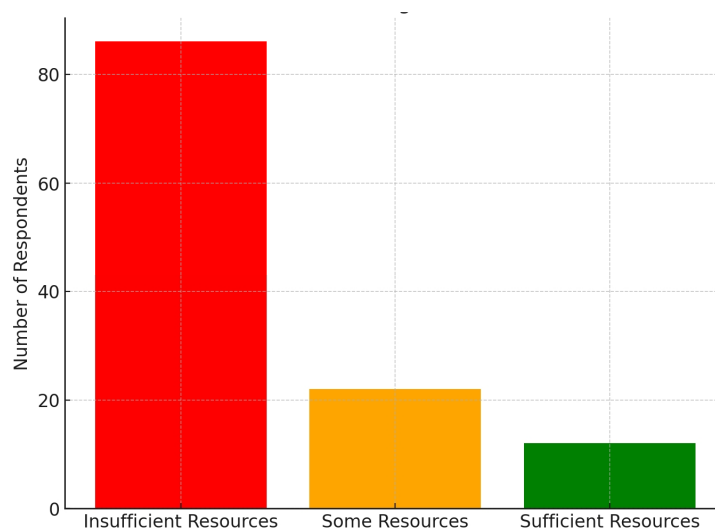
| Independent Variable                             | Dependent Variable        | Beta Coefficient ( $\beta$ ) | p-value | R <sup>2</sup> |
|--------------------------------------------------|---------------------------|------------------------------|---------|----------------|
| Work-Life Balance                                | Human Capital Development | 0.4                          | 0.003   | 0.3            |
| Support for Professional Development             | Human Capital Development | 0.47                         | 0.002   | 0.34           |
| Financial Resources for Professional Development | Human Capital Development | 0.39                         | 0.005   | 0.28           |

Source: Authors' calculation baes on SPSS Analysis, 2025

The descriptive analysis of AI resource allocation and the results from 120 participants indicate that:

- 72% (86 respondents) reported that their institutions do not allocate sufficient resources for AI training and integration.
- 18% (22 respondents) stated that their institutions provide some resources but not at a sufficient level.
- 10% (12 respondents) indicated that their institutions allocate sufficient resources for AI training and integration.

Figure 1. AI Resource Allocation in HEIs in North Macedonia



Source: Authors' calculations

Given that the majority of respondents believe their institutions do not provide adequate resources for AI training and integration, the null hypothesis ( $H_0$ ) is accepted, and the alternative hypothesis ( $H_1$ ) is rejected. This suggests that faculties in higher education institutions in North Macedonia currently are not investing enough in AI-related academic initiatives.

## CONCLUSION

The results of the study highlight the key factors influencing job satisfaction and human capital development in higher education institutions (HEIs) in North Macedonia. Recognition and respect, autonomy, salary, and support from faculty management were found to have a significant positive impact on job satisfaction, with support from faculty management having the strongest influence. This suggests that creating a supportive academic environment is essential for improving faculty satisfaction. Similarly, work-life balance, support for professional development, and financial resources for professional development were identified as critical determinants of human capital development, with support for professional development playing the most significant role. These findings indicate that while financial investment is important, structured career growth opportunities and a balanced work environment are more effective in fostering the development of human capital. Additionally, the study reveals a gap between AI's perceived potential and actual institutional investment, with most respondents reporting insufficient support for AI training and integration. Institutions must prioritize recognition, financial incentives, autonomy, and AI investment to improve academic staff engagement and institutional performance.

Our study aligns with existing literature, confirming that job satisfaction and human capital development in higher education depend on economic, managerial, and workplace factors. Herzberg's Two-Factor Theory (1959) and studies by Blanes i Vidal and Nossol (2011) and Markham et al. (2002) highlight salary, recognition, and autonomy as key drivers of job satisfaction, which our findings support. Similarly, workplace conditions, leadership, and career growth opportunities, emphasized by Mudor and Tooksoon (2011) and Hee et al. (2019), are crucial for human capital development. Regarding AI adoption, our results align with Vasiljeva et al. (2021) and Dabbous et al. (2022), confirming that leadership, organizational culture, and institutional investment are essential for AI integration. However, most respondents report insufficient AI resources, indicating that North Macedonian universities lag in AI implementation.

Therefore, HEIs in North Macedonia should prioritize professional development programs, enhance institutional support, and create an engaging academic culture to retain and motivate academic staff, ultimately improving both job satisfaction and institutional performance. To enhance job satisfaction and human capital development in North Macedonian higher education institutions, strategic policies should focus on improving institutional support, career development opportunities as well as financial incentives. Universities must implement transparent promotion structures, competitive salaries, and performance-based recognition programs to motivate employees and retain talent. Additionally, leadership should foster a supportive work culture by encouraging faculty participation in decision-making and providing mentorship programs for career growth. Investment in professional development through international collaborations, research grants, and continuous training is crucial for academic excellence. Furthermore, given the growing importance of AI in academia, institutions must allocate sufficient resources for AI training and integration, ensuring faculty members are equipped with the necessary digital skills. A holistic approach that combines financial, managerial, and technological advancements will enhance job satisfaction, improve employee retention, and strengthen the overall performance of higher education institutions in North Macedonia.

## REFERENCES

- Blanes i Vidal, Jordi, and Mareike Nossol. 2011. "Tournaments without prizes: Evidence from personnel records." *Management science* 57(10): 1721-1736.
- Bucața, George, and Cosmin Tileagă. 2023. "The role of human capital in the universities' management efficiency process." *Land Forces Academy Review* 28 (2): 136-147.
- Dabbous, Amal, Karine Aoun Barakat, and May Merhej Sayegh. 2022. "Enabling organizational use of artificial intelligence: an employee perspective." *Journal of Asia Business Studies* 16 (2): 245-266.
- Grant, Adam M., Jane E. Dutton, and Brent D. Rosso. 2008. "Giving commitment: Employee support programs and the prosocial sensemaking process." *Academy of management journal* 51 (5): 898-918.
- Hee, Ong Choon, Shahariah Haris Ong, Lim Lee Ping, Tan Owee Kowang, and Goh Chin Fei. 2019. "Factors influencing job satisfaction in the higher learning institutions in Malaysia." *International Journal of Academic Research in Business and Social Sciences* 9 (2): 10-20.
- Hertzberg, Frederick, Bernard Mausner, and Barbara Snyderman. 1959. "The motivation to work." *New York*.
- Hitka, Miloš, Alžbeta Kucharčíková, Peter Štarchoň, Žaneta Balážová, Michal Lukáč, and Zdenko Stacho. 2019. "Knowledge and human capital as sustainable competitive advantage in human resource management." *Sustainability* 11 (18). doi:10.3390/su11184985
- Kosfeld, Michael, Susanne Neckermann, and Xiaolan Yang. 2017. "The effects of financial and recognition incentives across work contexts: The role of meaning." *Economic Inquiry* 55 (1): 237-247.
- Lentjushenkova, Oksana. 2021. "Human capital development at higher education institutions." *Economics and Culture* 18 (2): 5-14.
- Mahazril'Aini, Yaakob, Hafizah Abdul Kadir, and Zuraini Yusof. 2012. "Factors Affecting Cooperatives' Performance in Relation to Strategic Planning and Members' Participation." *Procedia – Social and Behavioral Sciences* 65: 100–105.
- Markham, Charles E., Clinton R. Krehbiel, David R. Gill, David L. Lalman, Larry J. McBeth, and Robert L. Ball. 2002. "Effects of Fiber Source on Feedlot Performance and Carcass Characteristics of Yearling Steers." *Animal Science Research Reports*. Oklahoma Agricultural Experiment Station, Oklahoma State University.
- Mudor, Hamdia, and Tooksoon, Phadett. 2011. "Conceptual framework on the relationship between human resource management practices". *Journal of Economics and Behavioral Studies*, 2(2): 41-49
- Rezaei, Forouzan, Mohammad Khalilzadeh, and Paria Soleimani. 2021. "Factors affecting knowledge management and its effect on organizational performance: Mediating the role of human capital." *Advances in Human Computer Interaction* 2021(1). doi.org/10.1155/2021/8857572
- Selesho, Jacob M., and Idah Naile. 2014. "Academic staff retention as a human resource factor: University perspective." *International Business and Economics Research Journal* 13 (2): 295-304.
- Szromek, Adam R., and Radosław Wolniak. 2020. "Job satisfaction and problems among academic staff in higher education." *Sustainability* 12 (12). doi.org/10.3390/su12124865.
- Vasiljeva, Tatjana, Ilmars Kreituss, and Ilze Lulle. 2021. "Artificial intelligence: the attitude of the public and representatives of various industries." *Journal of Risk and Financial Management* 14 (8). doi.org/10.3390/jrfm14080339.





## REVIEW PAPERS



## Oluwatoba Oyedele Adeniwura

Department of Economics Olabisi Onabanjo  
University, Ago Iwoye,  
Nigeria

✉ adeniwuraoluwatoba@yahoo.com

## Anu Keshiro Toriola

Department of Economics Hallmark University,  
Ijebu Itete,  
Nigeria

✉ aktoriola@hallmarkuniversity.edu.ng

## Gbenro Mathew Sokunbi

Department of Economics Education Lagos State  
University of Education, Ijanikin,  
Nigeria

✉ sokunmbigm@lasued.edu.ng

## Dorothy Omogbohun Ndubueze

Department of Economics Olabisi Onabanjo  
University, Ago Iwoye,  
Nigeria

✉ dorothyndubueze@gmail.com

# COMPARATIVE ANALYSIS OF THE IMPORTANCE OF ARTIFICIAL INTELLIGENCE IN ADDRESSING SKILL GAPS IN COMMERCIAL BANKS IN NIGERIA AND UNITED KINGDOM

## КОМПАРАТИВНА АНАЛИЗА ЗНАЧАЈА ВЈЕШТАЧКЕ ИНТЕЛИГЕНЦИЈЕ У ПРЕВАЗИЛАЖЕЊУ ЈАЗА ВЈЕШТИНА У КОМЕРЦИЈАЛНОМ БАНКАРСТВУ НИГЕРИЈЕ И УЈЕДИЊЕНОГ КРАЉЕВСТВА

**Summary:** The disparities in AI adoption and its effect on skill gaps in the commercial banking sectors of Nigeria and the UK was explored in this study. In Nigeria, AI implementation faces barriers due to inadequate technological infrastructure, outdated educational curricula and limited access to AI training. In contrast, the UK, which has embraced AI more readily, grapples with concerns over data privacy and ethical consequences. Using a qualitative approach, the study analyzed data from academic literature, policy and appropriate documents published through a thematic analysis. The findings reveal that addressing the skills gap and improving infrastructure is crucial for effective AI adoption. AI enhances customer service efficiency but with challenges related to inadequate investment in job training and job displacement. While the UK has made progress in integrating AI due to its advanced technological infrastructure and robust training programs, Nigeria lags due to slow AI adoption, insufficient infrastructure, and limited training opportunities. The study concludes that significant disparities exist in AI skills between Nigeria and the UK, influenced by differences in technological infrastructure, education, and policy. It recommends that Nigeria prioritize improving infrastructure, updating educational systems, and the need to develop training programs which the skill gap in the country. In the UK, the focus should remain on addressing ethical concerns and data privacy to sustain successful AI integration.

**Keywords:** Artificial Intelligence, Skill gap, Commercial Bank, Nigeria, United Kingdom

**JEL Classification:**

**JEL Classification:** O33, J24, G21

**Резиме:** Овај рад истражује разлике у примјени вјештачке интелигенције (ВИ) и њен утицај на јаз у вјештинама у секторима комерцијалног банкарства Нигерије и Уједињеног Краљевства. У Нигерији имплементација ВИ наилази на препреке због недовољно развијене технолошке инфраструктуре, застарјелих образовних курикулума и ограниченог приступа обукама из области ВИ. Насупрот томе, Уједињено Краљевство, које је у већој мјери прихватило ВИ, суочава се с изазовима који се односе на заштиту података и етичке импликације. Кориштењем квалитативног приступа, истраживање је анализирано податке из академске литературе, јавних политика и релевантних докумената приликом тематске анализе. Резултати показују да је смањење јаз у вјештинама и унапређење инфраструктуре од пресудне важности за успјешну примјену ВИ. Вјештачка интелигенција унапређује ефикасност у пружању услуга корисницима, али истовремено доноси изазове у виду недовољних улагања у обуку запослених и ризика од губитка радних мјеста. Док је Уједињено Краљевство остварило значајан напредак у интеграцији ВИ захваљујући напредној технолошкој инфраструктури и свеобухватним програмима обуке, Нигерија заостаје због споријег темпа усвајања ВИ, недостатка инфраструктуре и ограничених могућности за развој компетенција. Студија закључује да постоје значајне разлике у вјештинама повезанима са ВИ између Нигерије и Уједињеног Краљевства, које произлазе из разлика у технолошкој развијености, образовним системима и регулаторним политикама. Препоручује се да Нигерија приоритетно ради на унапређењу инфраструктуре, модернизацији образовног система и развоју програма обуке ради смањења јаз у вјештинама. У Уједињеном Краљевству фокус би требало задржати на рјешавању етичких питања и заштити приватности података како би се осигурало одрживо и успјешно укључивање вјештачке интелигенције у пословање.

**Кључне ријечи:** вјештачка интелигенција, јаз у вјештинама, комерцијалне банке, Нигерија, Уједињено Краљевство  
**ЈЕЛ класификација:** O33, J24, G21

## INTRODUCTION

Globally, the relevance of artificial intelligence (AI) in addressing skill gaps in banking sector has become subject of increasing importance given the developing landscape of financial services. This study highlights the need to adapt to rapidly advancing AI technologies for more competitive strength and responsive to market demands. The need for integration of AI into banking sector is not only a response to technological innovations but also a necessary strategy to bridge the significant skill gaps that hinder the efficient operation of these institutions. In Nigeria, commercial banks face acute challenges in aligning workforce capabilities with modern AI demands, while banks in the UK have made more progress but still struggle to ensure their workforce possesses necessary skills. This difference highlights the need to address skill gaps in banking, both theoretically and practically.

AI streamlines operations, enhances decision-making, and improves customer service; however its successful implementation has been dependent on a skilled workforce adept at handling advanced technologies. Disruptive technologies like AI require innovative skills in data science, machine learning, and software development, which are often lacking in emerging markets such as Nigeria (Strusani and Hounbonon 2023). Conversely, the UK has educational institutions and corporate training programs more aligned with AI demands, facilitating smoother AI integration and greater operational efficiency (Biallas and O'Neill 2024). The Human Capital Theory assert that education and training increases workforce productivity and economic growth (Okolie et.al. 2019)), while the assertion from Technology Acceptance framework expound on the acceptance of technology by the user based on importance of technology and its easy usage (Davis 1989).

While literature on AI and skill gaps in banking has grown, findings are mixed. AI enhance financial inclusion by lowering costs and expanding access, but it may also lead to job displacement, necessitating upskilling (Bassey and Owushi 2023). Policies addressing skill gaps vary in effectiveness, with the UK making proactive efforts to integrate AI into financial services curricula, while Nigeria's policies often lack coordination and a strong educational framework (Osuiugbo and Alabi 2021).

The current realities in Nigeria's banking sector reveal disparities in skill levels, technological infrastructure, and regulatory frameworks. Slow AI adoption, inadequate infrastructure, and regulatory challenges hinder Nigeria's banking sector, while the UK's rapid integration of AI has improved efficiency and customer service (Kshetri 2021). Statistical data indicates that AI-driven solutions have led to reduced operational costs and increased customer satisfaction in the study emphasizes the need for targeted interventions in Nigeria to ensure equitable distribution of AI benefits (Strusani and Hounbonon 2023)

Despite advancements, AI implementation in financial services faces challenges like data privacy concerns and the digital divide, particularly in Nigeria where these issues disproportionately affect rural and lower-income communities (Kshetri 2021). The lack of infrastructure further hampers effective AI deployment in emerging markets (Strusani and Hounbonon 2023). This study aims to analyze the specific challenges in Nigeria's banking sector concerning AI adoption, comparing these findings with experiences from the UK to better understand factors influencing successful AI integration and workforce development. The literature suggests that while AI can revolutionize banking, its benefits remain unevenly distributed, with significant barriers in less developed markets (Strusani and Hounbonon 2023). By focusing on the specific conditions and realities of the Nigerian banking sector, this study aims to provide a more targeted analysis that can inform both practices and policies. The comparison with the UK banking sector provides a useful benchmark, allowing for a better review of factors that causes successful integration and workforce development. The objectives of the study are: to examine the level of AI skills among commercial banks employees in Nigeria; assess the level of AI skills of employees within commercial banks in UK; examine compare the level of AI skills of commercial banks in Nigeria and UK; compare how AI adoption affect the level of skill among commercial banks employees in Nigeria and UK

The study will address the gaps in the literature by providing insight on role of AI in closing the skill gaps of commercial banks employees in Nigeria and the UK. While previous studies have explored the effect of artificial intelligence on various industries, there has been limited focus on its specific effects on skill development in the banking sector of emerging economies like Nigeria. By providing a detailed comparative analysis, this study fills a crucial gap in understanding how AI can effectively be utilized to increase workforce capabilities in different economic contexts. Furthermore, this study addresses the existing knowledge gap by comparing the experiences of Nigeria and the UK

in AI adoption in the banking sector. The study's comparative analysis of the experiences of the banking sector adoption of AI in both Nigeria and UK is particularly valuable as it provides a broader knowledge on how artificial intelligence can be harnessed to address skill gaps in diverse economic environments, highlighting the importance of context-specific approaches to AI integration.

The analysis focuses on recent developments in AI technology and its influence on banking skills, covering the latest trends and advancements up to the present year. By limiting the scope to the commercial banking sector, the research provides insights into how AI can bridge skill gaps and enhance workforce capabilities within these institutions. A comparative analysis methodology is employed, utilizing both quantitative and qualitative data to evaluate and compare AI skill levels among bank employees in Nigeria and the UK. This approach incorporates surveys, interviews, and secondary data analysis, offering comprehensive insights into the challenges of AI integration and skill gaps in both countries.

The remaining section of the study contains literature review, methodology, results and discussions and lastly, conclusion and recommendations.

## 2. LITERATURE REVIEW

Artificial Intelligence (AI) is a computer science multidisciplinary domain which focuses on capable systems invention built to carry out human related activities. The definitions provided in various studies highlight the multifaceted nature of AI. For instance, Ogunode et al. (2023) and Osuizugbo and Alabi (2021) emphasize the breadth of AI technologies which includes machine learning, NLP, robotics, and computer vision. These technologies are integrated for executing complex human related functions which engages machines in data analysis and making of autonomous decision. Artificial intelligence systems are classified into; Narrow AI (designed system for recognition of image and translation of language; General AI (designed to achieve high level of cognitive ability) and Artificial super intelligence; (Igbinenikaro and Adewusi 2024). However, practical integration of AI technologies into banking sector varies as robotic process automation are being used to execute task such as credit scoring, detection of fraud and customer service (Kshetri 2021; Mallah Boustani 2022).

The skill gaps in the construction industry refer to the discrepancies between the current skills of professionals and those necessary for effectively implementing emerging technologies. Adepoju and Aigbavboa (2020) emphasize that addressing these gaps is vital for the successful integration of advanced technologies, necessitating continuous skill updates to align with industry advancements. Skill acquisition, defined as obtaining competencies to perform tasks effectively, plays a crucial role in enhancing employability and self-reliance (Osita et al. 2022). This process encompasses both formal education and informal training, aiming to provide individuals with practical experience relevant to the labor market.

Education-job mismatch, a significant issue affecting graduate unemployment, arises from the disparity between graduates' qualifications and employers' requirements. Aminu (2019) identifies over qualification and underqualification as two manifestations of this mismatch, highlighting the difficulties graduates face in aligning academic credentials with practical job market demands.

Professional ICT skills, necessary for specialized tasks within specific environments such as libraries, include expertise in database management and library management systems (Basahuwa et al. 2020). Staying updated with emerging technologies is essential for librarians to enhance their professional capabilities. Employability skills, which encompass technical competencies and soft skills are critical for securing and excelling in employment.

Technical skills are defined by Okwudili (2024) as specific knowledge and abilities acquired through formal education, vocational training which are needed for specialized tasks or experience. In contrast, soft skills encompass personal attributes and interpersonal interactions, with Okwudili (2024) stating that they include communication, teamwork, and problem-solving, which are crucial for career success.

## 2.1. Theoretical Review

This study is grounded in Human Capital Theory, which underscores the need to invest in skills and knowledge of the employee in order to enhance organizational performance and competitiveness (Tula et al. 2023). This theory posits that human capital-collective skills, knowledge, and experience is vital for economic growth and organizational efficiency. The human capital theory expound on how artificial intelligence and machine learning support the development of human capital through appropriate training, analysis and evaluations (Strusani and Hounghonon 2024).

The Technology Acceptance theory/model (TAM) by Fred Davis in 1989 asserts that factors affecting technology acceptance which are technology's usefulness and easy usage. TAM illustrates how employee and customer perceptions of AI's usability and benefits impact adoption rates in the banking sector (Eke et al. 2023). Effective integration of AI requires that banks consider these perceptions to enhance user engagement (Yakubu 2024).

Everett Rogers propounded the Diffusion of Innovations Theory in 1962. This theory analyse the role of AI in promoting industrial sustainability and the potential disruption in industries (Goralski and Tan 2020).

Technological Determinism, initially proposed by Thorstein Veblen, posits that technology primarily drives change in the society by shaping behaviors and structures. It suggests that advancements like AI can bring about change in economic and social systems (Igbinenikaro and Adewusi 2024).

## 2.2. Empirical Review

Several studies abound on the impact of AI across various sectors by highlighting its effect on bank services, employee performance and financial inclusion. The study by Bankins and Formosa (2023) on ethical implication of AI expounded the conceptual framework by identifying three major pathways to deploying AI (these are replacement of task, tending of machine and amplification of skills). The findings from this study suggest that the effect of AI on meaningful work dimensions is dependent on the implementation of the organization. Conversely, Mirbabaie et al. (2022) investigate the identity threats from AI in the workplace using a mixed-methods approach, finding that changes in work structure and perceived status loss predict AI identity threats, impacting employee well-being. Mallah Boustani's quantitative research on effect of AI on Lebanon's banking services shows that while AI improves transaction efficiency, there is need for human interaction with the client. This contrasts Sheth et al. (2022) findings that emphasizes necessity of AI in banking operations and highlight the relevance of human intervention and personalized services in emerging markets.

Noreen et al. (2023) explore the perspective of consumer on AI adoption in banking services across five countries in Asia, revealing positive correlations between adoption intentions and factors such as awareness and perceived usefulness, while perceived risk negatively affects these intentions. Ukpogon (2024) evaluate the integration of AI in Nigeria banking services, noting improvements both in credit risk management and personalized banking, though no significant difference in opinions on AI effectiveness exists between bankers and accounting lecturers. Elegunde and Osagie (2020) find that AI enhances operational efficiency in Nigerian banks and advocate for broader adoption and educational reforms.

The study by Nnaomah et al. (2024) highlights comparative analysis of AI in US and Nigeria, there is advanced integration in the US while there is challenge of inadequate infrastructure in Nigeria. Salayet al. (2022) review the transformative effect of AI across sectors in Nigeria, noting challenges like system flaws in health sector and marketing. Additional studies examine micro-work's role in AI development (Tubaro et al. 2020) and critical skill requirements in the AI era (Jaiswal et al., 2024)

## 3. METHODOLOGY

### 3.1. Research Design

The qualitative methodology is adopted as the research design for the study because of its capacity to effectively examine the multifaceted role of AI in bridging the skill gaps within the banking industry across various geographical and socio-economic settings. This qualitative approach

primarily involves content analysis of secondary data, facilitating a comprehensive investigation into the implementation of AI technologies in commercial banks and its subsequent impact on workforce skill development. The study utilises wide range of documents related to adoption of AI within the banking sector. These documents include reports and policy briefs on AI implementation in banking sector from both national and international organisations. These documents will give better understanding on institutional framework guiding AI's implementation within commercial banking. The validity and reliability of these documents is premised on the rigorous peer-review processes which enhance the accuracy and relevance of the data, particularly in the implementation of AI within the banking sector (Adams 2021)

### **3.2 Sample and Sampling Technique**

The study's sample includes relevant documents from the government agencies, international bodies, academic institutions, and industry. A purposive sampling technique was employed for inclusion of only documents that provide information relevant to AI implementation (Patton, 2015). This approach is particularly useful in qualitative research for selecting highly informative cases.

The documents selected were published within the last five years to capture recent trends and improvements in AI, reflecting how its use and expectations have evolved in commercial banking. As Ker et al. (2020) emphasize, AI is a rapidly changing field, and recent innovations and regulatory changes are essential for understanding its impact on skill gaps.

### **3.3. Method of Data analysis**

This study employs thematic analysis as its primary method for data analysis which allows pattern identifications, examinations and the connections within the data (Adams 2021). This approach is relevant to the study's objectives as it systematically explores the implications of AI integration in the banking sector, particularly regarding employee skills development in Nigeria and the UK. The thematic analysis process begins reviewing the data from secondary sources thoroughly which includes literatures from academics, reports from industry and records of company for analysis (Sampene et al. 2022).

Additionally, the study synthesizes findings from literature reviews and case studies to identify key trends and insights (Tula et al. 2023). This synthesis is crucial for drawing meaningful conclusions about the comparative relevance of AI across Nigeria and the UK. By integrating findings from various sources, the study develops a robust view of the differences and similarities in AI skill levels among employees in the commercial banking sectors of both countries.

## **4. RESULT AND DISCUSSIONS**

### **4.1. Objective One: The level AI skills of employees of commercial banks in Nigeria**

The implementation of AI technology in commercial banks is crucial for economic and technological development, especially in Nigeria, where a significant skills gap among employees hinders progress. AI can engage in the task of streamlining operations, improving decision, and enhancing customer's service, but Nigeria faces challenges like inadequate technological infrastructure and unaligned educational systems (Strusani and Hounbonon 2023). These obstacles slow down AI adoption, creating a mismatch between technological advancements and workforce readiness, thereby impacting economic progress.

AI technologies provide automation opportunities to improve adeptness in credit scoring, fraud detection, and customer service. However, Nigeria's commercial banks struggle to implement these technologies due to a lack of skilled professionals in fields like data science and machine learning, alongside outdated educational curricula (Elegunde and Osagie 2020). In comparison, more advanced economies like the UK have smoother AI integration due to better infrastructure and training programs (Kshetri 2021).

Therefore, addressing Nigeria's skills gap and infrastructure limitations is critical for the successful integration of AI in its banking sector, aligning education with the needs of industry and improving accessibility to AI training (Strusani and Hounghonon 2023)

#### **4.2. Objective Two: The level AI skills of employees of commercial banks in UK**

The adoption of artificial intelligence by the commercial banking industry in U.K. has intensified the need for employees with AI skills, given the transformative role of AI in banking operations (Igbinenikaro and Adewusi 2024; Ogunode et al. 2023). As AI technologies evolve, banks must equip their workforce with necessary skills to maintain competitive advantage and comply with regulatory requirements (MallahBoustani 2022). Globally, AI adoption in financial services has accelerated, with AI being used for functions like fraud detection and customer service (Kshetri 2021). The U.K.'s position as a global financial hub increases the urgency of this shift, as the adoption of AI has broad economic and societal impacts (Ododo et al. 2024).

AI technologies are transforming banking operations through automation of routine tasks to improving interactions with customers (Egara and Mosimege 2024; Osuizugbo and Alabi 2021). However, this rapid advancement has widened the skills gap, requiring extensive upskilling and reskilling initiatives (Bassey and Owushi 2023). AI skill development is crucial for enhancing operational efficiency, security, and maintaining a competitive edge (Igbinenikaro and Adewusi 2024).

The UK government and industry bodies have introduced policies like the "AI Sector Deal" to address AI skills gaps by promoting digital literacy and technical training (Bankins and Formosa 2023). Regulatory frameworks like the Financial Conduct Authority's guidelines emphasize best practices in AI adoption, though continued adaptation is needed for further technological developments (NirKshetri 2021).

#### **4.3. Objective Three: Compare the level AI skills of employees of commercial banks in Nigeria and UK**

The disparity in artificial intelligence skills between employees in commercial banks in Nigeria and the UK significantly affects both national economies and the global banking sector. AI is central to enhancing detection of fraud, data analysis and improved customer service (Kshetri 2021). However, Nigeria and the UK display vast differences in AI integration due to varying educational infrastructure, technological resources, and economic conditions (Strusani and Hounghonon 2023).

The UK's commercial banking sector has made significant strides in AI integration, supported by strong technological infrastructure and skilled professionals while Nigerian banks face challenges such as outdated curricula and insufficient infrastructure, which limit the adoption of advanced AI systems (Igbinenikaro and Adewusi 2024; Elegunde and Osagie 2020).

Furthermore, policy responses also differ. The UK's "AI Sector Deal" promotes digital literacy and workforce development, contributing to a conducive environment for AI innovation (Goralski and Tan 2020; Mirbabaie et al. 2022). Conversely, Nigeria's efforts to update curricula and foster digital literacy face challenges such as funding limitations and lack of stakeholder coordination, slowing AI adoption (Osuizugbo and Alabi 2021; Elegunde and Osagie 2020). Despite these issues, Nigeria has made progress through technology hubs and partnerships aimed at enhancing AI skills (Strusani and Hounghonon 2023). In conclusion, the UK's proactive approach in workforce development and AI integration contrasts sharply with Nigeria's slower adoption due to infrastructural and educational challenges.

#### **4.4. Objective Four: The influence of AI adoption on the level of skill of employees of commercial banks in Nigeria and UK**

With a global shift toward AI, the need for reevaluating workforce competencies is pressing, particularly in Nigeria, where commercial banks struggle to align employee capabilities with modern AI demands, exacerbated by inadequate infrastructure, limited training access, and outdated curricula (Elegunde and Osagie 2020). In the UK, although there has been notable progress in AI integration, challenges remain in ensuring the workforce possesses necessary skills (Kshetri 2021).

AI's influence on job roles and skills presents a complex landscape. In Nigeria, new technologies necessitate advanced skills in data science and machine learning, yet a shortage of

these skills hampers AI adoption (Strusani and Hounghonon 2023). Research indicates that while AI can streamline operations, Nigeria's limited skilled workforce restricts these benefits (Bassey and Owushi 2023). Conversely, UK banks benefit from advanced infrastructure and better-trained employees, allowing for more effective AI incorporation (Biallas and O'Neill 2024).

The need for training and development programs are vital for bridging skill gaps. Nigeria faces significant barriers due to limited AI training availability and effectiveness, compounded by employee adaptation (Osuizugbo and Alabi 2021). Employee adaptation and career progression are also critical. In Nigeria, slow AI adoption creates career development challenges, leaving many employees unprepared for AI-driven roles (Elegunde and Osagie 2020). UK employees generally adapt better due to robust training and support mechanisms (Biallas and O'Neill 2024).

Overall, disparities in AI adoption between Nigeria and the UK reveal need for targeted interventions in Nigeria towards investment in infrastructure, educational updates, and comprehensive training program to support the evolving employee needs in both regions.

## CONCLUSION AND RECOMMENDATIONS

The thematic analytical approach was adopted to analyze the four objectives of the study. The first objective assesses the level of AI competencies within Nigeria's commercial banking sector, emphasizing substantial obstacles and opportunities. AI holds transformative potential for banking operations, but its successful deployment hinges on improving technological infrastructure availability and the necessary skills need for operation and there is need for policies to address these challenges faced by Nigerian banks in order to boost sectoral competitiveness (Elegunde and Osagie 2020).

The second objective on AI competencies among employees in the UK commercial banking sector emphasize critical role of AI competencies among employees in shaping both the financial industry and the broader economy. While AI integration promises enhanced efficiency and customer service, it also introduces challenges such as workforce displacement, necessitating significant investment in employee training. Despite progress in current policies, continuous efforts are needed to ensure the workforce remains adept at managing and utilizing AI technologies effectively (Strusani and Hounghonon 2023).

The third objective offers a comparative analysis of AI competencies among commercial bank employees in Nigeria and the UK, revealing marked differences driven by variations in structure of education, technological accessibility and regulations. While Nigeria experiences difficulties in adopting AI, the UK showcases more usage of advanced AI and effective regulatory framework. Bridging these disparities in Nigeria will require enhancements to educational curricula, increased technological investments, and the implementation of policies tailored to each country's distinct requirements, all aimed at narrowing the skills gap and enhancing competitiveness.

The fourth objective explores the broader implications of AI integration within commercial banks, identifying significant contrasts between Nigeria and the UK. While AI has the potential to improve efficiency in operation and customer service, its success in Nigeria depends on availability of infrastructure and training opportunities. However, the UK benefits from increased access to technological infrastructure and training opportunities. Addressing these disparities will require targeted interventions that account for regional specificities, offering valuable insights into optimizing AI implementation for enhanced banking operations in both contexts.

## REFERENCES

- Adams, Rachel. 2021. "Can Artificial Intelligence Be Decolonized?" *Interdisciplinary Science Reviews* 46(1–2): 176–197. <https://doi.org/10.1080/03080188.2020.1840225>
- Adepoju, Oluwaseun O., and Clinton O. Aigbavboa. 2020. "Assessing Knowledge and Skills Gap for Construction 4.0 in a Developing Economy." *Journal of Public Affairs* 20(e2264): 1–10. <https://doi.org/10.1002/pa.2264>
- Akinode, Oluwaseyi S., and James Lekan. 2020. "Exploring the Potentials of Artificial Intelligence in the Judiciary." *International Journal of Engineering Applied Sciences and Technology* 5(8): 23–27. <http://www.ijeast.com>
- Aminu, Aminu. 2019. "Characterising Graduate Unemployment in Nigeria as Education–Job Mismatch Problem." *African Journal of Economic Review* 7(2): 113–120.
- Bankins, Sarah, and Paul Formosa. 2023. "The Ethical Implications of Artificial Intelligence (AI) for Meaningful Work." *Journal of Business Ethics* 185(4): 725–740. <https://doi.org/10.1007/s10551-023-05339-7>
- Basahuwa, Chinedu B., Victor E. Unegbu, and Yusuf T. Babalola. 2020. "ICT Skills and Job Performance of Librarians in Public Universities in North-Central, Nigeria." *Journal of Science Technology and Education* 8(1): 154–161. <https://www.atbuftejoste.com>
- Bassey, Miracle M., and Ebi Owushi. 2023. "Adoption of Artificial Intelligence in Library and Information Science in the 21st Century: Assessing the Perceived Impacts and Challenges by Librarians in Akwa Ibom and Rivers States." *International Journal of Current Innovations in Education* 6(1): 75–94. ISSN 2646-7380.
- Biallas, Mark, and Fergus O'Neill. 2024. *Artificial Intelligence Innovation in Financial Services*. Washington, DC: International Finance Corporation. <https://www.ifc.org/publications/artificial-intelligence-innovation-financial-services>
- Chen, Xi, Hai Xie, Dong Zou, and Gwo-Jen Hwang. 2020. "Application and Theory Gaps during the Rise of Artificial Intelligence in Education." *Computers and Education: Artificial Intelligence* 1: 100002. <https://doi.org/10.1016/j.caeai.2020.100002>
- Colling, Robert, Helen Pitman, Karin Oien, Nasir Rajpoot, Peter Macklin, and Richard L. Ball. 2019. "Artificial Intelligence in Digital Pathology: A Roadmap to Routine Use in Clinical Practice." *Journal of Pathology*. Wiley Online Library. <https://doi.org/10.1002/path.5310>
- Egara, Fanny O., and Mahlapane D. Mosimege. 2024. "Exploring the Integration of Artificial Intelligence-Based ChatGPT into Mathematics Instruction: Perceptions, Challenges, and Implications for Educators." *Education Sciences* 14(7): 742. <https://doi.org/10.3390/educsci14070742>
- Eke, Daniel O., Kutoma Wakunuma, and Solomon Akintoye, eds. 2023. "Introducing Responsible AI in Africa." In *Social and Cultural Studies of Robots and AI*. Cham: Springer. [https://doi.org/10.1007/978-3-031-08215-3\\_1](https://doi.org/10.1007/978-3-031-08215-3_1)
- Elegunde, Ayodeji F., and Rachael O. Osagie. 2020. "Artificial Intelligence Adoption and Employee Performance in the Nigerian Banking Industry." *International Journal of Management and Applied Research* 4(4): 189–204. <https://doi.org/10.29064/ijma.734734>
- Goralski, Michael A., and Toh K. Tan. 2020. "Artificial Intelligence and Sustainable Development." *The International Journal of Management Education* 18: 100330. <https://doi.org/10.1016/j.ijme.2019.100330>
- Igbinenikaro, Emmanuel, and Ayo O. Adewusi. 2024. "Policy Recommendations for Integrating Artificial Intelligence into Global Trade Agreements." *International Journal of Engineering Research Updates* 6(1): 1–10. <https://doi.org/10.53430/ijeru.2024.6.1.0022>
- Igwe, Paul A., Dennis Lock, and David G. Rugara. 2020. "What Factors Determine the Development of Employability Skills in Nigerian Higher Education?" *Innovations in Education and Teaching International*. <https://doi.org/10.1080/14703297.2020.1850319>
- Jaiswal, Ankit, C. J. Arun, and Amit Varma. 2024. "Rebooting Employees: Upskilling for Artificial Intelligence in Multinational Corporations." [In press or forthcoming].
- Kshetri, Nir. 2021. "The Role of Artificial Intelligence in Promoting Financial Inclusion in Developing Countries." *Journal of Global Information Technology Management* 24(1): 1–6. <https://doi.org/10.1080/1097198X.2021.1871273>
- Lloyd, Caroline, and Jonathan Payne. 2019. "Rethinking Country Effects: Robotics, AI, and Work Futures in Norway and the UK." *New Technology, Work and Employment*. <https://doi.org/10.1111/ntwe.12192>

- Mallah Boustani, Nadine. 2022. "Artificial Intelligence Impact on Banks' Clients and Employees in an Asian Developing Country." *Journal of Asia Business Studies* 16(2): 267–278. <https://doi.org/10.1108/JABS-09-2020-0376>
- Mirbabaie, Milad, Florian Brünker, Niklas R. J. Möllmann, and Stefan Stieglitz. 2022. "The Rise of Artificial Intelligence – Understanding the AI Identity Threat at the Workplace." *Electronic Markets* 32(1): 73–99. <https://doi.org/10.1007/s12525-021-00496-x>
- Nishant, Rohit, Michael Kennedy, and James Corbett. 2020. "Artificial Intelligence for Sustainability: Challenges, Opportunities, and a Research Agenda." *International Journal of Information Management* 53: 102104. <https://doi.org/10.1016/j.ijinfomgt.2020.102104>
- Nnaomah, Uche I., Olufemi A. Odejide, Sunday Aderemi, Daniel O. Olutimehin, Emmanuel A. Abaku, and Ogochukwu H. Orieno. 2024. "AI in Risk Management: An Analytical Comparison between the U.S. and Nigerian Banking Sectors." *International Journal of Science and Technology Research Archive* 6(1): 127–146. <https://doi.org/10.53771/ijstra.2024.6.1.0035>
- Noreen, Umme, Arooj Shafique, Zahid Ahmed, and Muhammad Ashfaq. 2023. "Banking 4.0: Artificial Intelligence (AI) in the Banking Industry and Consumer's Perspective." *Sustainability* 15(4): 3682. <https://doi.org/10.3390/su15043682>
- Ododo, Emmanuel P., Nse P. Essien, and Arit E. Bassey. 2024. "Effect of Generative Artificial Intelligence (AI)-Based Tool Utilization and Students' Programming Self-Efficacy and Computational Thinking Skills in JAVA Programming Course in Nigerian Universities." *International Journal of Contemporary Africa Research* 2(1): 42–47. <https://doi.org/10.5281/zenodo.12100074>
- Ogunode, Noah J., Kene Edinoh, and Raphael C. Okolie. 2023. "Artificial Intelligence and Tertiary Education Management." *Electronic Research Journal of Social Sciences and Humanities* 5(4): 18–28. <https://www.ereseearchjournal.com>
- Okolie, Ugochukwu C., Paul A. Igwe, Henry E. Nwosu, Benjamin C. Eneje, and Samuel Mlanga. 2019. "Enhancing Graduate Employability: Why Do Higher Education Institutions Have Problems with Teaching Generic Skills?" *Policy Futures in Education* 0(0): 1–20. <https://doi.org/10.1177/1478210319864824>
- Okwudili, Chijioke B. 2024. "Skills Mismatch in Nigeria's Labour Market: Bridging the Divide – A Case Study of Rivers State." *International Journal of Advanced Multidisciplinary Research and Studies* 4(3): 1533–1538.
- Oladoyinbo, Tunde O., Sunday O. Olabanji, Oluwaseun O. Olaniyi, Oluwafemi O. Adebisi, Oluwatobi J. Okunleye, and Abiodun I. Alao. 2024. "Exploring the Challenges of Artificial Intelligence in Data Integrity and Its Influence on Social Dynamics." *Asian Journal of Advanced Research and Reports* 18(2): 1–23. <https://doi.org/10.9734/AJARR/2024/v18i2601>
- Onwubere, Chinedu H. 2024. "Geospatial Data and Artificial Intelligence Technologies as Innovative Communication Tools for Quality Education and Lifelong Learning." *EJOTMAS: Ekpoma Journal of Theatre and Media Arts* 7(1–2): 50–59. <http://dx.doi.org/10.4314/ejotmas.v7i1-2.4>
- Osita, Francis C., Peter O. Oraegbunam, and Nkiru Onuzulike-Chukwuemeka. 2022. "Curbing Youth Unemployment in South-East Nigeria through Skill Acquisition and Entrepreneurial Education." *International Research Journal of Advanced Engineering and Science* 7(4): 150–155.
- Osuizugbo, Ifeanyi C., and Abiodun S. Alabi. 2021. "Built Environment Professionals' Perceptions of the Application of Artificial Intelligence in the Construction Industry." *Covenant Journal of Research in the Built Environment* 9(2): 48–66.
- Owolabi, John D., Daniel Malagwi, Olumide Oyeyipo, Emmanuel O. Ola-Ade, and Patricia F. Tunji-Olayeni. 2022. "Application of Artificial Intelligence in the Nigerian Building and Construction Industry." *International Journal of Advanced and Applied Sciences* 9(10): 33–39. <https://doi.org/10.21833/ijaas.2022.10.005>
- Salau, Ayodeji O., William B. Demilie, Adebayo T. Akindadelo, and Joseph N. Eneh. 2022. "Artificial Intelligence Technologies: Applications, Threats, and Future Opportunities." Paper presented at the *Workshop on Advances in Computation Intelligence, Its Concepts and Applications (ACI'22)* at ISIC 2022, Savannah, United States. *CEUR Workshop Proceedings*. <https://www.researchgate.net/publication/365715182>
- Sampene, Alfred K., Francis O. Agyeman, Richard Brenya, and Justice Wiredu. 2022. "Artificial Intelligence as a Pathway to Africa's Transformations." *Journal of Multidisciplinary Engineering Science and Technology (JMEST)* 9(1): 14939–14960. <https://doi.org/10.5281/zenodo.6496795>
- Sheth, Jagdish N., Vikas Jain, Gaurav Roy, and Abhishek Chakraborty. 2022. "AI-Driven Banking Services: The Next Frontier for a Personalised Experience in the Emerging Market." *International Journal of Bank Marketing* 40(6): 1428–1453. <https://doi.org/10.1108/IJBM-09-2021-0327>

- Strusani, Davide, and Georges Vivien Hounghonon. 2024. *The Role of Artificial Intelligence in Supporting Development in Emerging Markets*. Washington, DC: International Finance Corporation. [https://www.ifc.org/AI\\_Support\\_Development\\_Emerging\\_Markets](https://www.ifc.org/AI_Support_Development_Emerging_Markets)
- Tubaro, Paola, Antonio A. Casilli, and Marion Coville. 2020. "The Trainer, the Verifier, the Imitator: Three Ways in Which Human Platform Workers Support Artificial Intelligence." *Big Data and Society* 7(1): 1–12. <https://doi.org/10.1177/2053951720919776>
- Tula, Oluwasegun A., Olufemi Babayeju, and Emmanuel Aigbedion. 2023. "Artificial Intelligence and Machine Learning in Advancing Competence Assurance in the African Energy Industry." *World Journal of Innovation and Modern Technology* 7(2): 83–95. <https://doi.org/10.56201/wjimt.v7.no2.2023.pg83.95>
- Ukpong, Edidiong G. 2022. "Integration of Artificial Intelligence Applications for Financial Process Innovation by Commercial Banks in Nigeria." *AKSU Journal of Administration and Corporate Governance* 2(1): 125–128. Akwa Ibom State University.
- Yakubu, Yusuf. 2024. *Application of Artificial Intelligence in Technology-Enhanced Learning for Sustainable Growth and Inclusive Development in Nigeria*. Zaria: Federal College of Education.
- Yusuf, Taofeek I., Olalekan A. Adebayo, Lateef A. Bello, and Joseph O. Kayode. 2022. "Adoption of Artificial Intelligence for Effective Library Service Delivery in Academic Libraries in Nigeria." *Library Philosophy and Practice (e-journal)*, Paper 6804. <https://digitalcommons.unl.edu/libphilprac/6804>

This journal is open access - The journal's content is licensed under Creative Commons Attribution - NonCommercial - NoDerivs 4.0.



**Erjola Barbullushi**

Faculty of Economics,  
University of Shkodër "Luigj Gurakuqi",  
Albania

✉ erjola.barbullushi@unishk.edu.al

**Albana Kastrati**

Faculty of Economics,  
University of Shkodër "Luigj Gurakuqi",  
Albania

✉ albana.kastrati@unishk.edu.al

## EVALUATING THE EFFECTS OF ELECTRONIC BILLING AND FISCALIZATION ON BUSINESS EFFICIENCY AND TAX COMPLIANCE: A STUDY OF ALBANIAN ENTERPRISES

### PROCENA EFEKATA ELEKTRONSKE NAPLATE I FISKALIZACIJE NA POSLOVNU EFIKASNOST I USKLAĐENOST SA POREZOM: STUDIJA ALBANSKIH PREDUZEĆA

**Summary:** *The evolution of business processes, particularly in billing and taxation, has seen a significant shift towards digitization through the adoption of electronic billing systems and fiscalization reforms. This study delves into the impact of electronic billing and fiscalization on business performance, with a specific focus on Albanian enterprises, evaluating data from 2000 to 2023. The research investigates the benefits, challenges, and adoption factors of electronic invoicing, emphasizing its role in enhancing tax compliance, operational efficiency, and cost reduction. The study highlights how electronic billing streamlines invoice management, reduces administrative burdens, and contributes to environmental sustainability by minimizing paper usage. Despite these advantages, the transition poses challenges, especially for small and medium-sized enterprises (SMEs), due to high implementation costs, technical barriers, and limited awareness. A critical component of the research is the analysis of Albania's fiscalization reform, implemented in three phases starting in 2021, aiming to modernize the tax system, reduce informality, and align with European Union standards. The study assesses the fiscalization's effectiveness through quantitative methods, including t-tests and regression analyses, evaluating variables like turnover, taxable profit, corporate tax, and net profit across sectors such as pharmaceuticals, construction, manufacturing, and wholesale trade. Findings reveal that while fiscalization has not significantly altered overall turnover or net profit, it has led to a notable decrease in taxable profit, particularly impacting SMEs due to higher compliance costs. Larger firms, with more robust digital infrastructures, absorbed these costs more effectively. The study concludes that while fiscalization improves transparency and tax compliance, it disproportionately burdens smaller businesses, necessitating targeted policy interventions to support SMEs in the transition towards comprehensive digital tax compliance.*

**Keywords:** *Electronic Billing, Fiscalization Reform, Business Performance, Tax Compliance, Albanian Enterprises*

**JEL Classification:** *H26, M48, O33*

**Резиме:** Еволуција пословних процеса, посебно наплате и опорезивања, довела је до значајног помака ка дигитализацији кроз усвајање електронских система наплате и реформу фискализације. Ова студија се бави утицајем електронског фактурисања и фискализације на пословни учинак, са посебним фокусом на албанска предузећа, процењујући податке од 2000. до 2023. Истраживање анализира предности, изазове и факторе усвајања електронског фактурисања, наглашавајући његову улогу у побољшању пореске обавезе, оперативној ефикасности и смањењу трошкова. Студија наглашава како електронска наплата поједностављује управљање фактурама, смањује административна оптерећења и доприноси еколошкој одрживости минимизирањем употребе папира. Упркос овим предностима, транзиција представља изазове, посебно за мала и средња предузећа (МСП), због високих трошкова имплементације, техничких препрека и ограничене свести. Критична компонента истраживања је анализа реформе фискализације у Албанији, која се проводи у три фазе почевши од 2021. године, с циљем модернизације пореског система, смањења неформалности и усклађивања са стандардима Европске уније. Студија процењује ефикасност фискализације кроз квантитативне методе, укључујући т-тестове и регресијске анализе, процењујући варијабле као што су промет, опорезива добит, порез на добит предузећа и нето добит у секторима као што су фармацеутски производи, грађевинарство, производња и трговина на велико. Налази откривају да, иако фискализација није значајно променила укупан промет или нето добит, довела је до значајног смањења опорезиве добити, посебно утичући на МСП због већих трошкова усклађености. Веће фирме, са снажнијом дигиталном инфраструктуром, ефикасније су апсорбовале ове трошкове. Студија закључује да док фискализација побољшава транспарентност и усклађеност са порезом, она несразмерно оптерећује мања предузећа, захтевајући циљане интервенције политике за подршку малим и средњим предузећима у транзицији ка свеобухватном дигиталном поштовању пореза.

**Кључне ријечи:** електронска наплата, фискализација, пословна ефикасност, порез

**ЈЕЛ класификација:** *H26, M48, O33*

## INTRODUCTION

Technological advancement is rapidly evolving business processes, especially in billing and taxation. By moving away from the traditional way of using paper to deliver invoices to electronic billing and fiscalization, this is a huge shift in how businesses manage their finances and the way they make sure their invoices are aligned with the regulations of a country. Beyond the most immediate goals of improving operational efficiency, such a transformation may help achieve other end goals in terms of supporting tax compliance, reducing informality, and promoting transparency in financial reporting.

As electronic invoicing builds on the global trend towards digitalization has prompted several governments and businesses to integrate electronic invoicing systems as part of broader fiscalization reforms in recent times. Fiscalization: because of what, it is the real-time reporting of transactions to the tax authorities that helps to fight against tax evasion and secure the entire process of business transactions. As such, countries across Europe and beyond have adopted various forms of fiscalization to modernize their tax systems while simultaneously helping to reduce the shadow economy.

The electronic billing and fiscalization in the Republic of Albania is a greeted initiative towards harmonization of tax system of Republic of Albania with EU policies. Albania's fiscalization reform, which was started in 2021, was deployed modularly in three parts based on transaction types and sectors. The reform requires that every business transaction, both cash and cashless, must report electronically to the tax authorities in real-time. It is by putting this system into action that tax collection efficiency is achieved but even more so transparency and accountability is ensured in the business environment.

While the benefits are obvious, the process of switching to e-billing and fiscalization is not without its challenges, particularly for small and medium-sized enterprises (SMEs). Constraints in high implementation costs, technical complexities, and limited awareness have surfaced as major obstacles that could inhibit the realization of the complete benefits of the reform. In addition, it is still up for debate whether fiscalization has a positive or negative effect on business performance, particularly when it comes to whether the reliance on software to ensure compliance has led to higher operational costs, which in turn negatively affect profitability — a phenomenon in the literature confirmed by smaller size firms.

## 2. LITERATURE REVIEW

The billing process is an important part of a broader set of business processes, including the creation and acceptance of an order, delivery, and payment. Electronic billing enables the sending, receiving, and processing of invoices without manual intervention. It allows businesses to benefit from shorter payment delays, fewer errors, and reduced printing and mailing costs. However, the introduction of electronic invoice exchange is often complex and costly, especially for small and medium-sized enterprises (SMEs). This chapter presents the treatment of fiscalization, the advantages, and the challenges it presents in the literature.

### 2.1. Electronic Billing

Electronic billing can be defined as the dematerialized form of the invoice that has a structured and standardized format used between supply chain partners (Penttinen and Tuunainen 2009, 1; Penttinen 2008). Electronic billing is not entirely new. The transmission of invoices through an electronic format has existed for decades. Koch (2017) stated that the electronic billing market has existed for more than a few decades. Since the 1970s, EDIFACT (Electronic Data Interchange for Administration, Commerce, and Transport) has been used by large organizations as a mechanism for transmitting invoice data. However, these systems were point-to-point systems that required substantial investments to establish connections between the involved parties (Penttinen and Hyytiäinen 2008). Previously, the private industry acted as the main driver; however, currently, due to efforts to have an efficient tax system, governments are taking measures to implement electronic billing (Koch 2017).

There are different ways an invoice can be transmitted between business partners: (a) paper-based invoice sent by mail; (b) invoice exchanged as an electronic attachment (e.g., PDF) in an email;

(c) invoice created by scanning a paper document using optical character recognition; (d) invoice exchanged as a structured XML or EDI; (e) using both the paper-based invoice sent by mail and the electronic copy exchanged with the other methods mentioned earlier, i.e. (a) through (d); etc. (Keifer 2011). It has been noted that invoice exchange using email is more popular than EDI, and small and medium-sized enterprises (SMEs) generally prefer email compared to their larger counterparts. It has also been observed that the combination of PDF and XML invoices is gradually increasing (Koch 2017).

The use of electronic billing has gained attention in recent years. Specifically, it can be observed that most studies are empirical, using survey methods, followed by case studies, interviews, ethnographic studies, expert opinions, and secondary data. Most of these empirical studies have been carried out mainly in Europe, especially in Finland. These studies have mainly emphasized the determinants, benefits, and challenges of electronic billing.

The literature has discussed several drivers of electronic billing that encourage organizations to adopt electronic billing. Some of these include: optimizing accounts receivable and payable; reducing overall costs (Fairchild 2004); reducing printing costs (Poel et al. 2016); optimizing working capital (Fairchild 2004); increasing efficiency in terms of storage, time-saving, improved process control, better administration, increased security, fewer errors, etc. (Poel et al. 2016); pressure from supply chain partners (Fairchild 2004; Keifer 2011); regulatory pressure (Keifer 2011; Koch 2017); supplier innovation (Keifer 2011), among others.

## 2.2. Benefits and Challenges

The use of electronic billing is expected to offer several benefits not only for the immediate implementers but also for supply chain partners. Electronic billing can significantly reduce costs, for example, by reducing administrative work and printing costs (Edelman and Sintomen 2006; Penttinen and Tuunainen 2009). It offers improvement in delivery time, reduces payment delays, and provides greater reliability by reducing the error rate (Edelman and Sintomen 2006; Lumiaho and Rämänen 2011; Poel et al. 2016). It can also lead to process efficiency for the organization (Fairchild 2004; Sandberg et al. 2009). Another important benefit is that it provides convenience for the supply chain partners involved and improves customer service (Fairchild 2004; Sandberg et al. 2009; Poel et al. 2016). Electronic billing can greatly assist in tax compliance for companies and increase tax collection by the government, especially from high-risk non-compliance groups (Krysovaty et al. 2021; Olaleye et al. 2023; Skare et al. 2023). Furthermore, electronic billing offers several environmental benefits, such as reducing paper usage and increasing energy efficiency (Poel et al. 2016).

Despite the numerous benefits that electronic billing offers, the adoption rate has been slow due to the challenges faced by adopters. While large enterprises may find it easy to implement an electronic billing system, their smaller counterparts face difficulties in adopting it due to high investment and integration costs (Sandberg et al. 2009). Fairchild (2004) emphasized the limited allocation of capital and the lack of internal support as major barriers to using electronic billing. Edelman and Sintonen (2006) highlighted several reasons for the non-adoption of electronic billing among SMEs. These reasons included lack of demand in the environment, perceived uncertainty, and low levels of awareness. Fragmentation of buyers may also be another reason for the difficulty in adopting such a technology. Challenges may also arise from the service provider side; for example, fragmentation of service providers can significantly hinder implementation among supply chain partners (Keifer 2011).

From the previous literature on electronic billing, it can be observed that most studies have focused on the benefits and challenges of electronic billing, while some have focused on the determinants of electronic billing adoption. However, literature on electronic billing still lacks a strong theoretical foundation. Furthermore, most previous studies have originated from developed countries, while the contribution to developing economies is limited.

## 2.3. Factors Affecting the Adoption of Online Billing Systems

Technological factors that are expected to affect the adoption of technology are based on Rogers' Diffusion of Innovations Theory. These factors are relative advantage, compatibility, complexity, observability, and trialability (Rogers 2010). Relative advantage refers to "the degree to

which an innovation is perceived as being better than the idea or technology it supersedes” (Rogers 2010; Moore and Benbasat 1991). For an innovation to have a higher likelihood of adoption, it must show that it offers an advantage over the technology it replaces. Electronic billing will have several advantages over traditional paper-based billing (Edelman and Sintomen 2006; Fairchild 2004; Poel et al. 2016). Waarts et al. (2002) argued that in the early stages of the diffusion process, adoption tends to be driven mainly by a combination of internal strategic incentives and company attitudes, along with external forces such as industry competition and supplier activities. Later, they suggest that the mix of adoption drivers seems to focus more on implementation issues, such as system scalability. Electronic billing is based on the principle of digitally exchanging information and is, therefore, highly scalable. Previous studies on other innovations have shown that relative advantage is positively associated with the adoption of that innovation (Ghobakhloo et al. 2011; Oliveira et al. 2014; Sun et al. 2020).

Compatibility refers to “the degree to which an innovation is perceived as consistent with the existing values, needs, and past experiences of potential adopters” (Rogers 2010; Moore and Benbasat 1991). For electronic billing to have a higher chance of adoption, it must fit with the existing values and requirements and the past experiences of the organization. Previous studies on other technologies have shown a positive impact of compatibility on the adoption of those technologies (Ghobakhloo et al. 2011; Wang et al. 2016; Waarts et al. 2002). There needs to be a compatibility in mindset and skills within the company and between supply chain partners, as resistance to change and barriers to adopting a new innovation may arise from this (Töytäri et al. 2018).

Complexity refers to “the degree to which an innovation is perceived as relatively difficult to understand and use” (Rogers 2010). For an innovation to have a higher likelihood of adoption, it must be easy to integrate with the organization's business operations. If organizations perceive the technology as difficult to understand and use, it will act as a barrier to its adoption. Complexity describes the model, in which its nine systems are complex in many ways, following the local rule with many interactions (Mehra et al. 2020; Moore and Benbasat 1991). Mehra et al. (2020) further mentioned that the chances of technology innovation acceptance will naturally increase by reducing its complexity. The complexity of technology has been found to negatively affect the adoption of those technologies (Oliveira et al. 2014; Wang et al. 2016).

Observability refers to “the degree to which the results of an innovation are visible to others” (Rogers 2010). Technological innovations whose impacts are easily observable within the industry will be looked upon more favorably, thus having higher prospects for adoption (Marak et al. 2019). Past studies on innovative technologies have shown observability to increase user adoption of those innovations (Al-Jabri and Sohail 2012; Teo et al. 1995).

Trialability refers to “the degree to which an innovation can be experimented with prior to adoption” (Rogers 2010). Firms and users generally prefer to have a trial of a new technology before making a decision and committing resources to implement it (Marak et al. 2019). Trialability can lead to a better understanding of the new technology, such as its capabilities, benefits, and difficulties. It can help the firm increase familiarity with the new technology (Agarwal and Prasad 1998; Rogers 2010; Al-Jabri and Sohail 2012).

## 2.4 Fiscalization process in Albania

The Fiscalization Reform is a major commitment of the Albanian Government to minimize the informal economy through the modernization of the tax monitoring system.

Through this process the government aims to:

- Minimizing the level of the informal economy;
- Improving revenue collection;
- Easier identification of tax evasion;
- Making tax audits more cost-efficient;
- Reducing the level of corruption in administration;
- Providing more public services for citizens and businesses;
- Positioning Albania closer to European Union standards.

The fiscalization process comes as a directive from the EU, where its implementation is aimed for all member countries in the medium term. Fiscalization involves three phases until its full implementation:

- Phase 1 involves the electronic issuance of tax invoices for entities that have a sales-purchase relationship with state institutions. The implementation of this phase started on 01.01.2021. The issuance of tax invoices to public entities, by all registered taxpayers, is done through the fiscalization system.
- Phase 2 involves the electronic issuance of tax invoices between private entities that have a sales-purchase relationship, and payments/collections are made without cash (only by bank). The implementation of this phase starts on 01.07.2021. All registered taxpayers issuing a tax invoice to another private entity will do so through the fiscalization system.
- Phase 3 involves the electronic issuance of tax invoices for entities with a sales-purchase relationship with private entities and final consumers. The implementation of this phase starts on 01.09.2021. All registered taxpayers issuing a tax invoice to a private entity or a private entity with a final consumer will do so through the fiscalization system. In this phase, payments and collections are made only in cash.

Some of the positive aspects of fiscalization include the reduction of informality by having more registered tax-paying entities that fulfill their obligations, and the modernization of businesses fiscalized invoices bring digitalization to an entity, transactions are more easily verifiable, and the system improves the efficiency of the entity.

Fiscalization aims to increase transparency and reduce corruption. As a country aspiring to join the EU, reducing corruption is one of the key criteria.

Increase revenue for the country's budget. A fiscalized invoice is proof that taxes, such as VAT, when the entire cost is borne by the consumer, are declared and paid to the state. To report real-time data in "selfcare" on electronic invoices, each taxpayer must ensure they have financial software or a software that integrates with their current system or fiscalized cash register. The data must be stored in isolated and locked fiscal memory to prevent any possible modification. Each invoice must be electronically signed, and for this, businesses must be equipped with a certificate, which can be provided by AKSHI. This document is renewed every year at a cost of approximately 4000 Lek. Also, to avoid dependency on a specific technological model, the new system does not rely on hardware or software, but on open standards that provide access via the internet. Fiscalization is software-based and can be easily implemented by all taxpayers. In the long term, this significantly reduces business costs.

## 2.5 Costs and Issues

The cost of fiscalization varies depending on the type of activity. For new cash registers suitable for fiscalization requirements, the cost ranges from 230-275 euros, for existing fiscal registers 138 euros, and for software solutions 130-200 euros. As with any new program, fiscalization faced difficulties during its implementation. The platform was slow and faced constant blockages during declaration periods.

Small taxpayers and those from rural areas did not have the infrastructure necessary to successfully complete the fiscalization process. The platform did not allow the issuance of credit notes for invoices issued before the fiscalization period. There were occasional issues with the monthly reports and transactions, and not always was the information provided in real-time. The fiscalization process is very important in our country, as it increases business transparency and helps the government fight tax evasion, as it is easily verifiable for tax fraud and failure to declare fiscal invoices. This makes it easier to involve businesses in the informal economy, and all controls are focused on these businesses that do not declare fiscal invoices.

The fiscalization process in the EU started earlier than in our country. Primarily around 2016, countries like France and Germany implemented this process. In France, the main requirement is to have a POS certified by the state, where the invoice data cannot be modified. In France, fiscalization started in 2017 with the preservation of complete data in a chronological and unmodifiable manner, and in 2018, new control rules were implemented.

Germany set the goal for full implementation by 31 December 2022. Serbia, a neighboring country, started in December 2020 and aimed to complete it by the end of this year. Austria began in 2016, with the basic focus on data preservation in each POS. Bulgaria started in 2018 and established new rules for fiscal devices with necessary elements like "QR CODE." Slovenia began fiscalization in

2016, with new laws for all taxpayers except government bodies. Italy introduced fiscal laws to avoid violations with changes to data declarations through automatic reporting. In 2021, the government implemented electronic invoicing, and fiscalization is now done in real-time. Albanian businesses, now with existing fiscal devices (after spending resources on upgrading them) and new software (which led to market liberalization), can issue fiscal invoices that are registered directly in the central server of the General Directorate of Taxes. However, even though this may have eased tax control or cross-checking of information, problems with evasion should not be considered fully resolved, and fiscalization has presented a range of other issues.

### 3. METHODOLOGY

The secondary data used in this study have been gathered from the National Business Center (QKB), focusing on economic units operating in the main cities of Albania. The objective of this data collection is to refine the scope of the research and ensure a more targeted analysis. The selection of business entities is based on two key criteria:

- Geographical Location – The businesses must cover the trade centers.
- Continuity Principle – Only businesses that have been operational since before 2017 and continue their activities up to 2024 have been considered. Firms that have submitted declarations of suspension or liquidation to QKB have been excluded from the study.

This approach ensures that only long-standing and active businesses are included, allowing for a more reliable analysis of financial trends, operational performance, and market stability over a substantial period. The study primarily focuses on the financial performance of the selected businesses, using the following key indicators:

- Total Turnover– The overall revenue generated by the business.
- Earning Before Taxes (EBT)– The profit reported before taxation.
- Corporate Income Tax– The tax imposed on the company's earnings.
- Net Profit– The profit remaining after all expenses, including taxes, have been deducted.

By examining these financial variables, the study aims to provide a comprehensive overview of business performance and identify key factors influencing profitability across different sectors.

Out of a total of 223 businesses selected the study includes firms from a diverse range of industries, ensuring a balanced representation. The businesses are distributed across the following economic sectors:

- Manufacturing– Includes companies involved in the production of goods.
- Wholesale Trade – Businesses engaged in bulk sales and distribution.
- Construction– Firms specializing in residential, commercial, and infrastructural development.
- Pharmaceutical Sector– Companies operating in the medical and healthcare industry.

The pharmaceutical sector has been analyzed separately due to its unique market dynamics and regulatory environment. This distinction helps in drawing clearer comparisons between general commercial enterprises and those within the specialized healthcare industry.

To examine the financial data and extract meaningful insights, the study applies various statistical techniques using SPSS 20, a software widely used for social sciences and business analytics. The following methods have been employed: Descriptive Analysis, Comparison of Group Means, Correlation Analysis, Regression Analysis.

## 4. RESEARCH FINDINGS

### 4.1 Descriptive Analysis

From the data analyzed, we have processed the following statistical measures, providing insights into industry averages in terms of turnover, standard deviation, and additional information on the distribution of this variable.

*Table 1 - Descriptive Data for Net Sales, in mln ALL*

| Annual Turnover | Wholesale Trade | Pharmaceutical | Construction | Manufacturing |
|-----------------|-----------------|----------------|--------------|---------------|
| Mean            | 57,272,095      | 2,088,903,926  | 119,550,240  | 77,119,398    |
| Median          | 20,818,419      | 1,841,995,696  | 59,483,716   | 39,694,820    |
| Std. Deviation  | 61,030,772      | 1,357,524,257  | 139,967,714  | 120,379,363   |
| Minimum         | 2,611,632       | 393,964,182    | 9,129,535    | 3,363,333     |
| Maximum         | 184,832,893     | 4,554,198,750  | 498,889,679  | 493,272,793   |
| Range           | 182,221,261     | 4,160,234,568  | 489,760,144  | 489,909,460   |
| Skewness        | 0.883           | 0.501          | 1.679        | 2.627         |
| Kurtosis        | -0.956          | -0.725         | 1.740        | 6.015         |

Source: Author's calculations

Pharmaceutical companies exhibit the highest average annual turnover, with approximately 2 billion ALL in yearly revenue. They are followed by construction and manufacturing firms, while wholesale trade companies report an average annual turnover of approximately 57 million ALL.

*Table 2 - Descriptive Data for EBT, in mln ALL*

| Taxable Profit | Wholesale Trade | Pharmaceutical | Construction | Manufacturing |
|----------------|-----------------|----------------|--------------|---------------|
| Mean           | 2,278,615       | 206,117,647    | 12,269,682   | 2,843,421     |
| Median         | 883,813         | 190,189,342    | 5,970,819    | 1,370,198     |
| Std. Deviation | 3,025,782       | 95,066,424     | 15,117,258   | 4,953,984     |
| Minimum        | -328,118        | 44,733,277     | 463,597      | -7,410,840    |
| Maximum        | 10,284,257      | 372,445,998    | 64,426,207   | 17,645,912    |
| Range          | 10,612,375      | 327,712,721    | 63,962,610   | 25,056,752    |
| Skewness       | 1.633           | 0.078          | 1.985        | 1.528         |
| Kurtosis       | 1.504           | -1.062         | 4.289        | 2.899         |

Source: Author's calculations

Similarly, pharmaceutical companies report the highest taxable profit, followed by construction and manufacturing firms. Wholesale trade companies exhibit taxable profit levels similar to manufacturing businesses.

*Table 3 - Descriptive Data for Corporate Income Tax, in mln ALL*

| Corporate Income Tax | Wholesale Trade | Pharmaceutical | Construction | Manufacturing |
|----------------------|-----------------|----------------|--------------|---------------|
| Mean                 | 342,325         | 33,412,616     | 1,885,579    | 462,191       |
| Median               | 132,572         | 31,284,035     | 895,623      | 153,329       |
| Std. Deviation       | 462,135         | 17,034,216     | 2,314,299    | 755,063       |
| Minimum              | -               | 6,709,992      | -            | -             |
| Maximum              | 1,560,258       | 65,331,193     | 9,696,940    | 2,850,562     |
| Skewness             | 1.637           | 0.387          | 1.843        | 2.201         |
| Kurtosis             | 1.487           | -0.717         | 3.657        | 4.126         |

Source: Author's calculations

The largest corporate taxpayers are pharmaceutical companies, which, despite their small number in the market, contribute an average of 33 million ALL per year in corporate tax.

Table 4 - Descriptive Data for Net Profit

| Net Profit     | Wholesale Trade | Pharmaceutical | Construction | Manufacturing |
|----------------|-----------------|----------------|--------------|---------------|
| Mean           | 1,956,644       | 172,705,031    | 10,367,610   | 2,545,710     |
| Median         | 751,241         | 158,905,307    | 5,075,196    | 1,009,328     |
| Std. Deviation | 2,546,999       | 78,358,274     | 12,844,830   | 4,008,393     |
| Minimum        | -               | 38,023,285     | -187,905     | -3,408,916    |
| Maximum        | 8,723,999       | 307,114,805    | 54,729,267   | 14,806,637    |
| Skewness       | 1.655           | 0.033          | 1.998        | 1.774         |
| Kurtosis       | 1.553           | -1.096         | 4.330        | 2.990         |

Source: Author's calculations

Once again, pharmaceutical firms lead with the highest net profits, followed by construction and wholesale trade companies. Manufacturing businesses report the lowest net profits.

## 4.2 Comparative Analysis

Studies suggest that new technological implementations, such as an online invoicing system, may lead to positive outcomes for invoice management and tax compliance. However, these changes can also introduce short-term challenges, affecting sales and operations.

To examine this effect, a t-test was conducted to determine whether there were statistically significant differences in sales before and after the implementation of fiscalization. Given that fiscalization represents an intervention (shock) in financial operations, the independent samples t-test was used.

Table 5- Independent sample test

|                      |                             | t-test for Equality of Means |        |                 |                 |
|----------------------|-----------------------------|------------------------------|--------|-----------------|-----------------|
|                      |                             | t                            | df     | Sig. (2-tailed) | Mean Difference |
| Total turnover       | Equal variances assumed     | -.185                        | 22     | .855            | -4697709.417    |
|                      | Equal variances not assumed | -.185                        | 21.794 | .855            | -4697709.417    |
| EBT                  | Equal variances assumed     | -.207                        | 22     | .838            | -261797.667     |
|                      | Equal variances not assumed | -.207                        | 21.645 | .838            | -261797.667     |
| Corporate Income tax | Equal variances assumed     | -.311                        | 22     | .759            | -59789.083      |
|                      | Equal variances not assumed | -.311                        | 21.786 | .759            | -59789.083      |
| Net Profit           | Equal variances assumed     | -.229                        | 22     | .821            | -242716.000     |
|                      | Equal variances not assumed | -.229                        | 21.685 | .821            | -242716.000     |

Source: Author's calculations

The t-test results indicate no statistically significant differences in annual turnover, taxable profit, or net profit before and after fiscalization. Since p-values > 0.05, we fail to reject the null hypothesis, indicating that the average sales remain the same before and after fiscalization when considering all units together.

Further sectoral analysis suggests that certain industries may be more sensitive to fiscalization's impact than others.

Table 6- Statistics t-test in pharmaceutical sector

|                      |                         | t-test for Equality of Means |    |                 |                 |
|----------------------|-------------------------|------------------------------|----|-----------------|-----------------|
|                      |                         | t                            | df | Sig. (2-tailed) | Mean Difference |
| Total turnover       | Equal variances assumed | -.155                        | 15 | .879            | -105834397      |
| EBT                  | Equal variances assumed | -.492                        | 15 | .630            | -23289180       |
| Corporate Income tax | Equal variances assumed | -.516                        | 15 | .613            | -4375149        |
| Net Profit           | Equal variances assumed | -.485                        | 15 | .635            | -18914030       |

Source: Author's calculations

The analysis of the generated data reveals that fiscalization has had no statistically significant impact on the declaration of turnover or EBT within the pharmaceutical sector.

Table 7- Statistics for t-test for construction sector

|                      |                         | t-test for Equality of Means |    |                 |                 |                       |                                           |          |
|----------------------|-------------------------|------------------------------|----|-----------------|-----------------|-----------------------|-------------------------------------------|----------|
|                      |                         | t                            | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |          |
|                      |                         |                              |    |                 |                 |                       | Lower                                     | Upper    |
| Total turnover       | Equal variances assumed | -1.172                       | 35 | .249            | -54497872       | 46512335              | -148922933                                | 39927188 |
| EBT                  | Equal variances assumed | -.980                        | 35 | .334            | -4893669        | 4991110               | -15026163                                 | 5238823  |
| Corporate Income Tax | Equal variances assumed | -.788                        | 35 | .436            | -605554         | 768184                | -2165050                                  | 953942   |
| Net Profit           | Equal variances assumed | -1.021                       | 35 | .314            | -4324982        | 4235828               | -12924171                                 | 4274207  |

Source: Author's calculations

The analysis of the generated data indicates that fiscalization has not led to any statistically significant change in the declaration of turnover, taxable profit, or net profit in the construction sector.

Table 8- Statistics for t-test in manufacturing sector

|                      |                         | t-test for Equality of Means |    |                 |                 |                       |
|----------------------|-------------------------|------------------------------|----|-----------------|-----------------|-----------------------|
|                      |                         | t                            | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference |
| Total Turnover       | Equal variances assumed | -.147                        | 43 | .884            | -5345997        | 36304936              |
| EBT                  | Equal variances assumed | -.637                        | 43 | .527            | -947750         | 1487431               |
| Corporate Income Tax | Equal variances assumed | -.432                        | 43 | .668            | -98155          | 227282                |
| Net Profit           | Equal variances assumed | -.425                        | 43 | .673            | -512336         | 1206659               |

Source: Author's calculations

The analysis of the generated data indicates that fiscalization has not resulted in any statistically significant change in the declaration of turnover or taxable profit in the manufacturing sector.

Various studies suggest that the impact of implementing a new technological tool, such as the online invoicing system, may vary for businesses operating at different levels of annual turnover. For this reason we separated the entities in two groups, depending on the turnover, below 100 mln All and above 100 mln ALL. From the statistics in table 9 and table 10, since p-value > 0.05, we can conclude that fiscalization has had no significant impact on the turnover or profit of businesses, regardless of whether their annual turnover is above or below 100 million ALL.

Table 9 - t-Test Statistics before and after fiscalization for units operating below 100 Million ALL

|                      |                         | t-test for Equality of Means |    |                 |                 |                       |
|----------------------|-------------------------|------------------------------|----|-----------------|-----------------|-----------------------|
|                      |                         | t                            | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference |
| Total Turnover       | Equal variances assumed | -.086                        | 31 | .932            | -749737.287     | 8701548               |
| EBT                  | Equal variances assumed | .244                         | 31 | .809            | 196825.540      | 806114                |
| Corporate Income Tax | Equal variances assumed | .638                         | 31 | .528            | 74437.478       | 116737                |
| Net Profit           | Equal variances assumed | .077                         | 31 | .939            | 55027.548       | 710120.641            |

Source: Author's calculations

Table 10 - t-Test Statistics Before and After Fiscalization for Units Operating Above 100 Million ALL

|                      |                         | t-test for Equality of Means |    |                 |                 |                       |
|----------------------|-------------------------|------------------------------|----|-----------------|-----------------|-----------------------|
|                      |                         | t                            | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference |
| Total Turnover       | Equal variances assumed | -.300                        | 48 | .765            | -102174954      | 340234094             |
| EBT                  | Equal variances assumed | -.457                        | 48 | .650            | -13932794       | 30492821              |
| Corporate Income Tax | Equal variances assumed | -.465                        | 48 | .644            | -2363202        | 5086069               |
| Net Profit           | Equal variances assumed | -.455                        | 48 | .651            | -11569592       | 25440638              |

Source: Author's calculations

### 4.3 Regression Analysis

The comparative analysis revealed that there was no statistically significant change in turnover or taxable profit before and after fiscalization. To measure the extent to which the implementation of an online invoicing system and the associated costs have impacted business performance, a regression analysis was conducted.

The general regression equation used:

$$\text{Net Profit} = \beta \times \text{Turnover} + \text{Constant}$$

A change in the Beta coefficient indicates an impact on the profit margin. If the coefficient decreases, it suggests an increase in costs due to fiscalization, whereas an increase in Beta indicates that the fiscalization system has positively impacted profitability.

R-squared = 0.768, indicating that 76.8% of the variability in net profit is explained by annual turnover. A high correlation exists between turnover and net profit, suggesting that turnover is a strong predictor of profitability.

*Table 11 - Regression Statistics for model 1, coefficients before and after fiscalization*

| Model                | R                               | R Square | Adjusted R Square | Std. Error of the Estimate       |        |       |
|----------------------|---------------------------------|----------|-------------------|----------------------------------|--------|-------|
| 1                    | 0.879                           | 0.772    | 0.768             | 29,182,916.957                   |        |       |
| Model                | Unstandardized Coefficients (B) |          | Std. Error        | Standardized Coefficients (Beta) | t      | Sig.  |
| Before Fiscalization | (Constant) 3,042,342.593        |          | 4,092,733.714     | -                                | 0.743  | 0.460 |
|                      | Turnover 0.066                  |          | 0.005             | 0.879                            | 14.019 | 0.000 |
| After Fiscalization  | (Constant) 4,876,441.343        |          | 4,520,358.332     | -                                | 1.079  | 0.285 |
|                      | Turnover 0.067                  |          | 0.005             | 0.879                            | 14.499 | 0.000 |

Source: Author's calculations

Before and after fiscalization, Beta remains constant at 0.879, indicating that the relationship between turnover and net profit did not change significantly. The p-value (Sig.) is 0.000, meaning the relationship between turnover and net profit is statistically significant. However, only a minor change (0.001) in net sales was observed before and after fiscalization, suggesting that fiscalization had a negligible impact on profitability.

The second regression is performed on estimating how much turnover affected EBT. R-squared = 0.765, meaning 76.5% of the changes in EBT can be explained by turnover. Fiscalization expenses have a slightly stronger effect on taxable profit than on net profit.

*Table 12 - Regression Statistics for Model 2, coefficients before and after fiscalization*

| Model                | R                               | R Square | Adjusted R Square | Std. Error of the Estimate       |        |       |
|----------------------|---------------------------------|----------|-------------------|----------------------------------|--------|-------|
| 1                    | 0.875                           | 0.765    | 0.761             | 35,360,346.563                   |        |       |
| Model                | Unstandardized Coefficients (B) |          | Std. Error        | Standardized Coefficients (Beta) | t      | Sig.  |
| Before Fiscalization | (Constant) 3,544,021.336        |          | 4,959,082.148     | -                                | 0.715  | 0.478 |
|                      | Turnover 0.079                  |          | 0.006             | 0.875                            | 13.758 | 0.000 |
| After Fiscalization  | (Constant) 5,858,825.671        |          | 5,575,611.214     | -                                | 1.051  | 0.297 |
|                      | Turnover 0.080                  |          | 0.006             | 0.871                            | 13.991 | 0.000 |

Source: Author's calculations

A slight decrease in Beta (0.004) after fiscalization indicates that taxable profit as a percentage of turnover declined by 0.4%, which is statistically significant. The negative effect of fiscalization is more pronounced in EBT than in net profit.

As we mentioned before not just industry change but the size of the entities can be an indicator to evaluate what effect visualization has. For this purpose we tried the regression for entities with turnover less than 100 mln ALL. The results indicate that fiscalization has a greater impact on small businesses, as taxable profit declined by 1.8% after fiscalization.

*Table 13 - Regression statistics for businesses with turnover below 100 million all, coefficients before and after fiscalization*

| Model                | R                               | R Square | Adjusted R Square | Std. Error of the Estimate       |        |       |
|----------------------|---------------------------------|----------|-------------------|----------------------------------|--------|-------|
| 1                    | 0.491                           | 0.241    | 0.216             | 5,323,954.581                    |        |       |
| Model                | Unstandardized Coefficients (B) |          | Std. Error        | Standardized Coefficients (Beta) | t      | Sig.  |
| Before Fiscalization | (Constant) - 315,280.006        |          | 924,070.953       | -                                | -0.341 | 0.735 |
|                      | Turnover 0.070                  |          | 0.023             | 0.491                            | 3.087  | 0.004 |
| After Fiscalization  | (Constant) 541,014.380          |          | 689,444.441       | -                                | 0.785  | 0.438 |
|                      | Turnover 0.052                  |          | 0.016             | 0.485                            | 3.138  | 0.004 |

Source: Author's calculations

The drop in Beta from 0.070 to 0.052 confirms a statistically significant decrease in EBT.

*Table 14 - Regression statistics for businesses with turnover over 100 million all, coefficients before and after fiscalization*

| Model                | R                               | R Square | Adjusted R Square | Std. Error of the Estimate       |       |       |
|----------------------|---------------------------------|----------|-------------------|----------------------------------|-------|-------|
| 1                    | 0.844                           | 0.712    | 0.699             | 81,071,734.712                   |       |       |
| Model                | Unstandardized Coefficients (B) |          | Std. Error        | Standardized Coefficients (Beta) | t     | Sig.  |
| Before Fiscalization | (Constant) 9,250,290.645        |          | 12,654,783.847    | -                                | 0.731 | 0.473 |
|                      | Turnover 0.076                  |          | 0.010             | 0.844                            | 7.376 | 0.000 |
| After Fiscalization  | (Constant) 14,314,191.662       |          | 13,971,046.498    | -                                | 1.025 | 0.316 |
|                      | Turnover 0.076                  |          | 0.010             | 0.838                            | 7.522 | 0.000 |

Source: Author's calculations

Fiscalization had a lesser impact on large businesses, with a 0.6% decline in taxable profit margins. However, this decline is still statistically significant at a 95% confidence level.

Main findings of the study include that fiscalization did not significantly impact overall turnover, suggesting that digital tax reporting does not inherently drive revenue growth.

There was a statistically significant decline (0.4%) in taxable profit, particularly for SMEs where the decline reached 1.8%.

These findings are in accordance with Fairchild (2004) and Sandberg et al. (2009) who found that businesses implementing electronic invoicing systems initially experience increased administrative costs, which may offset revenue benefits. Oliveira et al. (2014) highlighted that while digital tax compliance improves record-keeping and audit transparency, it does not directly stimulate business growth unless accompanied by broader digital transformation. Ghobakhloo et al. (2011) emphasized that larger firms tend to absorb fiscalization costs more easily, while smaller businesses struggle due to resource constraints, aligning with this study's finding that fiscalization disproportionately affects SMEs.

On the other hand small businesses (turnover < 100 million ALL) experienced a larger reduction in EBT (1.8%) than larger businesses (0.6%). This suggests higher compliance costs and adaptation challenges for SMEs.

Edelman and Sintonen (2006) found that SMEs often face greater financial burdens when adapting to regulatory changes, particularly in industries with low levels of prior digitalization. Keifer (2011) and Koch (2017) both suggested that government-mandated digital tax systems impose disproportionately high costs on smaller firms, as they may lack the technical infrastructure or financial resources to integrate new systems efficiently. Gounaris and Koritos (2012) demonstrated that regulatory-induced technological changes can create competitive imbalances, favoring larger firms that can better afford compliance costs a key takeaway from this study

## CONCLUSION

Based on the analysis and data provided from the tests we can conclude that:

### *1. Fiscalization has a minimal impact on net profit but affects taxable profit*

While net profit remained largely unchanged before and after fiscalization (Beta = 0.879 in both cases), EBT saw a statistically significant decline (0.4% decrease). This suggests that the overall profitability of businesses remained stable, indicating that companies were able to adjust costs or operational efficiency to absorb the effects of fiscalization.

Second, the decline in EBT likely reflects higher compliance costs, potentially due to additional administrative expenses, software costs, or operational adjustments.

Fiscalization might have influenced accounting practices, leading businesses to optimize declared expenses to offset taxable income.

### *2. Small businesses are more affected by fiscalization than larger firms*

Businesses with turnover below 100 million ALL experienced a 1.8% drop in taxable profit margins post-fiscalization. This is three times higher than the decline seen in businesses with turnover above 100 million ALL (0.6%).

The greater impact on smaller businesses suggests that SMEs struggle more with compliance costs, as they may lack specialized accounting resources to efficiently manage fiscalization requirements. Larger firms can spread the additional costs over a higher revenue base, making fiscalization relatively less burdensome for them. Policy implications: Fiscalization policies should consider tiered compliance structures, offering subsidies or support to SMEs to mitigate these financial burdens.

### *3. Fiscalization's impact varies by business sector*

While the data does not explicitly break down industries, prior studies suggest that sectors with lower digital adoption rates (such as construction or wholesale trade) may experience greater difficulties in adopting electronic invoicing systems. Pharmaceutical and large retail businesses are more likely to already have digital infrastructure, reducing adaptation costs. Construction, manufacturing, and small wholesale firms may have been forced to upgrade systems, incurring higher upfront costs. Future research could segment businesses by industry to further analyze how fiscalization affects profitability across different sectors.

### *4. Fiscalization does not stimulate revenue growth*

One potential expectation of fiscalization was that increased transparency and automation would drive higher business performance over time. However, the data suggests that turnover remained statistically unchanged before and after fiscalization, indicating that fiscalization alone did not drive business growth. This contradicts the assumption that electronic invoicing and tax compliance automation directly lead to increased revenue. Businesses might not yet be fully utilizing the efficiency benefits of fiscalization. Increased compliance costs may offset any process efficiencies, especially in the short term. A longer observation period might be needed to assess whether fiscalization has any delayed positive effects on growth.

### *5. Potential long-term effects: competitive advantages for early adopters*

While short-term effects of fiscalization show cost increases, in the long run, businesses that adapt early might gain a competitive advantage: Automated invoicing could lead to faster payments and improved cash flow. Compliance with electronic tax reporting could reduce audit risks and improve financial stability. Businesses investing in advanced digital accounting tools may enhance efficiency and gain a market advantage over competitors that are slower to adopt.

Encouraging businesses to embrace digital transformation beyond just tax compliance (e.g., through ERP systems, AI-driven accounting) could help them leverage fiscalization for long-term efficiency gains.

In the long run, businesses that effectively integrate digital invoicing systems may experience operational efficiencies, but fiscalization alone does not inherently drive revenue growth. For fiscalization to become a catalyst for digital transformation and economic development, support mechanisms must be implemented to reduce its financial strain, particularly on SMEs.

## REFERENCES

- Agarwal, Ritu, and Jayesh Prasad. 1998. "A Conceptual and Operational Definition of Personal Innovativeness in the Domain of Information Technology." *Information Systems Research* 9(2): 204–215. <https://doi.org/10.1287/isre.9.2.204>.
- Al-Jabri, I. M., and M. S. Sohail. 2012. "Mobile Banking Adoption: Application of Diffusion of Innovation Theory." *Journal of Electronic Commerce Research* 13(4): 379–391.
- Edelman, David C., and Sami Sintonen. 2006. "Adoption of Electronic Invoicing in Finland: Challenges and Opportunities." *Journal of E-Business* 3(2): 45–57.
- Fairchild, A. M. 2004. "Information Technology Outsourcing in the Public Sector: An Empirical Analysis of Outsourcing Decision and Contracting Behavior." *Journal of Public Procurement* 4(3): 361–390.
- Ghobakhloo, Morteza, Mehdi S. Sabouri, T. S. Hong, and Norhayati Zulkifli. 2011. "Information Technology Adoption in SMEs: An Integrated Framework." *International Journal of Business and Management* 6(5): 1–15. <https://doi.org/10.5539/ijbm.v6n5p1>.
- Gounaris, Spyridon P., and Christos D. Koritos. 2012. "Adoption of Electronic Invoicing in B2B Transactions: The Role of Organizational Culture and Trust." *Industrial Marketing Management* 41(5): 689–698. <https://doi.org/10.1016/j.indmarman.2011.09.008>.
- Keifer, J. 2011. "E-Invoicing Adoption in the Global Economy: Barriers and Drivers." *Journal of Financial Operations* 7(3): 23–36.
- Koch, R. 2017. "The Evolution of Electronic Invoicing: Trends and Future Outlook." *Journal of Business and Industrial Marketing* 32(6): 892–902. <https://doi.org/10.1108/JBIM-10-2015-0196>.
- Krysovaty, Andriy, Anna Vorontsova, and Svitlana Melnyk. 2021. "E-Invoicing as a Tool for Tax Compliance: Evidence from Eastern Europe." *Journal of Tax Research* 19(2): 250–271.
- Lumiaho, M., and Janne Rämänen. 2011. "Benefits of E-Invoicing for Supply Chain Management." *International Journal of Logistics Management* 22(1): 123–138. <https://doi.org/10.1108/09574091111127548>.
- Marak, S., Nima Kordzadeh, and James Warren. 2019. "The Role of Observability in Technology Adoption: An Empirical Analysis." *Information and Management* 56(2): 249–260. <https://doi.org/10.1016/j.im.2018.05.00>
- Mehra, P., A. Saxena, and S. Ahuja. 2020. "Complexity in Digital Transformation: A Systems Perspective." *Journal of Business Research* 116: 731–740. <https://doi.org/10.1016/j.jbusres.2020.05.047>.
- Moore, Gary C., and Izak Benbasat. 1991. "Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation." *Information Systems Research* 2(3): 192–222. <https://doi.org/10.1287/isre.2.3.192>.
- Oliveira, Tiago, Maria Thomas, and Manuel Espadanal. 2014. "Assessing the Determinants of Cloud Computing Adoption: An Analysis of the Manufacturing and Services Sectors." *Information and Management* 51(5): 497–510. <https://doi.org/10.1016/j.im.2014.03.006>.
- Olaleye, S., A. R. Sanusi, and T. Ogundare. 2023. "The Role of E-Invoicing in Tax Administration: Evidence from Developing Economies." *Journal of Accounting and Taxation* 15(1): 12–25.
- Penttinen, Eero. 2008. *The Adoption of Electronic Invoicing in Business Networks*. Helsinki School of Economics.
- Penttinen, Eero, and Kari Hyytiäinen. 2008. "E-Invoicing: A Survey on Current Practices and Future Prospects." *Journal of Information Systems* 22(3): 1–15.
- Penttinen, Eero, and Virpi Kristiina Tuunainen. 2009. "Assessing the Value of Inter-Organizational Information Systems in E-Invoicing." *Journal of Strategic Information Systems* 18(4): 317–331. <https://doi.org/10.1016/j.jsis.2009.06.002>.
- Poel, K., Ellen Bloemen, and Johan Van den Bergh. 2016. "Environmental Impact of Electronic Invoicing: A Life-Cycle Assessment." *Journal of Industrial Ecology* 20(6): 1294–1305. <https://doi.org/10.1111/jiec.12354>.
- Rogers, Everett M. 2010. *Diffusion of Innovations*. 5th ed. New York: Free Press.
- Sandberg, Kristian, Oskar Wahlberg, and Andreas Norrman. 2009. "Logistics and IT Integration: E-Invoicing Implementation Challenges." *International Journal of Physical Distribution and Logistics Management* 39(9): 721–739. <https://doi.org/10.1108/09600030911011463>.
- Skare, Marinko, Boris Blažević, and Domingo R. Soriano. 2023. "Electronic Invoicing and Tax Compliance: A Global Perspective." *Journal of Business Research* 153: 237–248. <https://doi.org/10.1016/j.jbusres.2022.12.035>.
- Sun, Yuchen, Dong Liu, Shixuan Chen, Xitong Wu, and Xiao-Liang Shen. 2020. "Understanding Users' Adoption of Mobile Payment: An Empirical Study of WeChat Pay." *Industrial Management and Data Systems* 120(5): 889–907. <https://doi.org/10.1108/IMDS-01-2019-0015>.
- Teo, Hock-Hai, Kwok-Kee Wei, and Izak Benbasat. 1995. "Predicting Intention to Adopt Interorganizational Linkages: An Institutional Perspective." *MIS Quarterly* 19(1): 19–49. <https://doi.org/10.2307/249713>.

- Töytäri, Pekka, Risto Rajala, and Tomás B. Alejandro. 2018. "Organizational Capabilities in Value-Based Selling: A Framework and an Empirical Study." *Industrial Marketing Management* 70: 121–135. <https://doi.org/10.1016/j.indmarman.2017.08.014>.
- Waarts, Eric, Yvonne van Everdingen, and Jos van Hillegersberg. 2002. "The Dynamics of Factors Affecting the Adoption of Innovations." *Journal of Product Innovation Management* 19(6): 412–423. [https://doi.org/10.1016/S0737-6782\(02\)00152-4](https://doi.org/10.1016/S0737-6782(02)00152-4).
- Wang, Yu-Ming, Yi-Shun Wang, and Yu-Feng Yang. 2016. "Understanding the Determinants of RFID Adoption in the Manufacturing Industry." *Technological Forecasting and Social Change* 132: 168–178. <https://doi.org/10.1016/j.techfore.2016.04.009>.



**Milan Lubura**

United Nations Development Programme,  
Sarajevo,  
Bosnia and Herzegovina

✉ lubura.milan@gmail.com

## LABOUR MIGRATION: CHALLENGE OR OPPORTUNITY FOR THE DEMOGRAPHIC FUTURE AND ECONOMIC STABILITY OF SOUTHEAST EUROPE

### РАДНЕ МИГРАЦИЈЕ: ИЗАЗОВ ИЛИ ПРИЛИКА ДЕМОГРАФСKE БУДУЋНОСТИ И ЕКОНОМСKE СТАБИЛНОСТИ ЈУГОИСТОЧНЕ ЕВРОПЕ

**Summary:** *The focus of this paper is the role of labor migration in addressing the demographic and economic challenges of Southeast Europe. Low birth rates, an aging population, and high levels of emigration have resulted in labor shortages and pressure on public systems. By analyzing demographic data and examining the experience of the Visegrád Group, the paper places special emphasis on the need to develop comprehensive economic migration strategies, strengthen institutional capacities, and improve the integration of foreign workers. Special attention is also given to regional cooperation and alignment with EU and international standards. Labor migration represents an opportunity for population rejuvenation, filling labor shortages, and boosting productivity—provided that appropriate legal and social inclusion frameworks are in place.*

**Keywords:** Labor migration, demographic challenges, Southeast Europe, migrant integration, economic stability

**JEL classification:** J11, J14, J15

**Резиме:** Фокус истраживања овог рада је улога радних миграција у процесу ублажавања демографских и економских изазова Југоисточне Европе. Ниска стопа natalитета, старење становништва, као и висок степен емиграције резултирају недостатком потребне радне снаге и притиском на јавне системе. Анализом демографских података, те сагледавањем искустава Вишеградске групе, рад посебан акценат ставља на потребу развоја свеобухватних стратегија економских миграција, јачање институционалних капацитета, те побољшање интеграције страних радника. Посебна пажња је усмјерена ка регионалној сарадњи, те усклађености са ЕУ и међународним стандардима. Радне миграције представљају прилику за подмлађивање популације, попуњавање дефицитарних радних мјеста и раст продуктивности, уз предуслов адекватне правне и социјалне инклузије.

**Кључне ријечи:** Радне миграције, демографски изазови, Југоисточна Европа, интеграција миграната, економска стабилност

**JEL класификација:** J11, J14, J15

## INTRODUCTION

The countries of Southeast Europe face numerous challenges that have a negative impact on population dynamics in the region. Inefficient governance structures, combined with high levels of corruption and the passive implementation of policies aimed at aligning education systems with labor market needs, have led to persistently high unemployment rates, particularly among the younger population. The lack of adequate mechanisms for developing job-relevant skills further exacerbates the situation, especially as the average age of the population continues to rise—placing additional strain on already fragile pension systems.

The complexity of the demographic challenges is also reflected in the fact that none of the Southeast European countries have achieved a fertility rate of 2.1 in the past decade, which is necessary for simple population replacement. Consequently, the region is experiencing population decline. Poor economic conditions, the prevalence of the informal economy, and various forms of workplace discrimination and exploitation are further delaying the age at which people start families. Negative natural population growth and a shrinking number of newborns are contributing to a shortage of labor, limiting the ability to fill vacant jobs. In this context, labor migration presents an opportunity for economic stability and a potential solution to the region's demographic problems.

For the purposes of this paper, Southeast Europe is defined as including the following countries: Serbia, Bosnia and Herzegovina, Montenegro, North Macedonia, Albania, and Kosovo\* (United Nations 1999). Through a comprehensive analysis, the paper seeks to address the current

demographic and migration-related challenges facing the region; identify the opportunities and obstacles in the process of successful labor migration; assess whether a functional regional framework for labor migration exists; and offer recommendations necessary for creating an attractive labor environment. A broader perspective also includes the successful integration of labor migrants into local societies, with family reunification offering a pathway to rejuvenating the population of Southeast Europe—bringing with it numerous economic and social benefits.

In line with the above, the hypothesis of this paper is as follows: “The process of labor migration creates positive demographic changes in the countries of Southeast Europe.”. The subject of the research has been addressed through the collection of data from relevant international databases – the World Bank, the European Commission, the European Union Statistical Database, the United Nations – as well as from national statistical databases of Southeast European countries. The time frame of the analysis covers the period from 1960 to 2024, with the aim of examining demographic change trends and the factors influencing them.

Furthermore, by applying a comparative method among Southeast European countries, the research seeks to identify similarities and differences in demographic trends, regulations related to the management of labor migration, and their alignment with the EU legal framework and international standards. The methodological approach also includes a comparative analysis with the Visegrád Group countries, in order to better understand the complexity of labor migration processes, the opportunities and challenges posed by this phenomenon, and the ways in which Southeast European countries can better prepare for it.

## 1. DEFINITION OF TERMS

In order to provide a clearer understanding of the content and analysis, the following key terms used in this paper are defined:

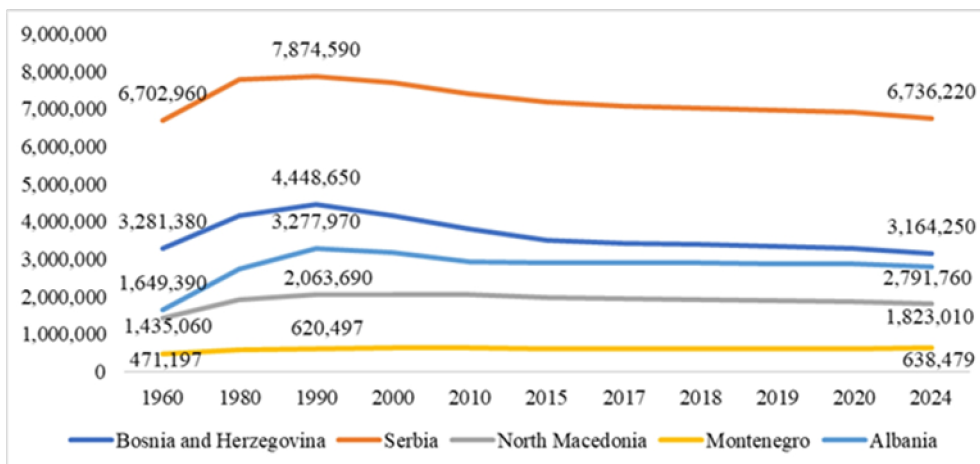
- **Labor Migration** – Refers to the movement of individuals for the purpose of performing paid work in the receiving country, whether it is internal migration (within a single country) or international migration (cross-border movement). It can be temporary or permanent and includes both voluntary and forced forms of economically motivated migration.
- **Demographic Changes** – Refers to long-term changes in the population structure of a country or region, including birth rate, mortality, age structure, fertility rate, life expectancy, and migration.
- **Fertility** – The average number of children a woman would bear during her reproductive period. A fertility rate of 2.1 is considered necessary for the simple reproduction of the population.
- **Migrant Integration** – A complex and two-way process of incorporating migrants into the host country’s society. It includes economic, social, cultural, and legal dimensions, such as access to the labor market, education, healthcare, and rights.
- **Discrimination** – Refers to unequal treatment of individuals or groups based on their personal characteristics such as national or ethnic origin, gender, religion, language, skin color, or migrant status. In the context of labor migration, discrimination is most commonly reflected in limited access to employment, denial of rights, or exposure to unfavorable working conditions.
- **Xenophobia** – Denotes fear, intolerance, or hostility toward foreigners, migrants, or individuals perceived as "others" in society.

## 2. DEMOGRAPHIC ANALYSIS OF SOUTHEAST EUROPE

The countries of Southeast Europe are undergoing significant demographic transformations. The long-term demographic trend in this region is characterized by a declining total population, which is confirmed by the demographic growth rate in 2024 being below the global population growth rate (0.87%) (Worldometer 2025). This negative trend in overall population dynamics is further exacerbated by other factors such as accelerated population aging, negative natural population growth, and the mass emigration of young and educated individuals. These processes reflect broader European

trends, but their presence in the region is particularly pronounced due to historical conflicts, institutional weaknesses, and a prolonged economic transition.

*Chart 1. Demographic Profile of Southeast Europe from 1960 to 2024*

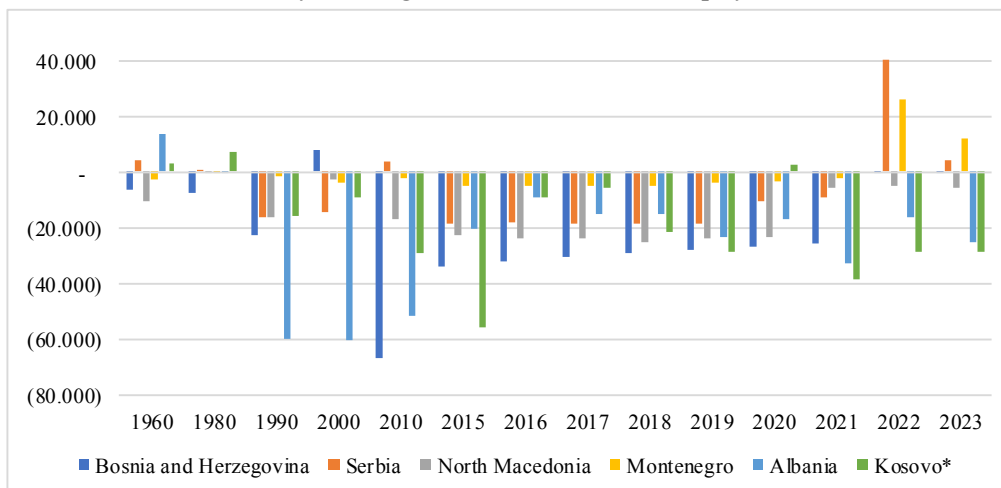


Source: World Population Review 2025

Since the early 1990s, most countries of the Western Balkans have experienced a continuous decline in population. In 2022, the fertility rate in all six Southeast European countries remained below the population replacement level of 2.1, with the lowest rate recorded in Bosnia and Herzegovina (1.3) (World Bank 2025). This natural decline has been further worsened by high mortality rates, particularly in rural and remote areas with limited access to healthcare. Additionally, all countries in the region have seen a continuous rise in the population aged 65 and over. Since the 1960s, this segment of the population in Bosnia and Herzegovina and Serbia has grown from 548,765 (in 1960) to 2,168,837 in 2023 (World Bank 2025). Such demographic shifts exert pressure on healthcare and pension systems, which are increasingly unsustainable due to limited financial resources. In all Southeast European countries, the pension system remains centered on the intergenerational solidarity model, with insufficient utilization of private pension insurance schemes. Given the declining number of working-age individuals—who must support a growing number of retirees—the economic and fiscal stability of these states is under serious threat.

The complexity of the demographic challenges is further underscored by the large number of emigrants, particularly young and educated professionals seeking better career opportunities, most often in Western Europe. This brain drain not only reduces the labor force but also negatively impacts the long-term development of human capital and economic innovation.

*Chart 2. Overview of Net Migration in Southeast Europe from 1960 to 2023*



Source: World Bank. 2025.

Between 1960 and 2023, most countries in the region experienced a general trend of negative net migration—that is, more people left the region than entered it. Positive net migration was recorded only in the past two years in Serbia, due to the influx of Chinese workers, and in Montenegro, due to the increasing number of work permits issued to seasonal laborers.

In addition to significant international migration, internal migration has also drawn attention, as it significantly alters the demographic landscape of the region. A long-standing trend of rural depopulation is evident, with people leaving villages and rural areas in favor of urban centers, which offer better access to education, employment opportunities, and healthcare services.

United Nations projections suggest that the countries of the region will continue to experience population decline until 2060 and beyond, unless strategic measures are taken to reverse the trend. Expectations indicate that Bosnia and Herzegovina could lose 1.4 million people by 2080 compared to 2025, which amounts to nearly one-third of its population (United Nations 2025). The situation is no better in the rest of the region, where projections also show continued population decline. These forecasts highlight the urgent need to adopt comprehensive demographic and migration strategies with a strong regional focus.

### 3. LABOUR MIGRATION AS A DRIVER OF POSITIVE DEMOGRAPHIC CHANGE

Labour migration, as a significant social phenomenon, represents a strategic response to negative demographic changes. Accelerated population aging, accompanied by low birth rates, is reducing the domestic labor force. Through the integration of foreign labor, efforts are being made to maintain the productivity of national economies and ensure fiscal balance (Radeljić 2021). From an economic perspective, labor migration is significant both from the standpoint of supply and demand. On the supply side, foreign workers fill vacant positions in the labor market. This is especially important in the case of shortage occupations and jobs that are unattractive to the local population (UN DESA 2024). On the demand side, foreign labor stimulates domestic consumption, and by taxing their incomes, the tax base needed to support public services is maintained. Furthermore, the domestic economy benefits from the innovation potential brought by migrants through their skills and qualifications. This is particularly relevant in Southeast Europe, given the mismatch between the skills of the domestic labor force and the needs of the labor market (Ivlevs 2019). In recent times, there has been a growing presence of labor shortages in the construction, agriculture, and healthcare sectors.

Immigration provides an opportunity to mitigate the effects of population aging by increasing the share of the working-age population, facilitating family reunification of labor migrants, and to some extent improving the birth rate. By bringing in families or forming new households, the goal is to rejuvenate and renew the local population. It is important to understand that this will not produce short-term effects, but from a long-term perspective, there is a basis for creating a more balanced age structure (UN DESA 2024). Economically, the employment of foreign workers contributes to the increase of public revenues through income taxation and contributions to pension and health insurance systems. In this way, fiscal pressure caused by the growing elderly population is reduced. Foreign workers also bring entrepreneurial spirit with them, and with adequate support, they launch their own businesses and create new jobs (UN DESA 2024).

### 4. CHALLENGES OF INTEGRATING FOREIGN WORKERS INTO SOCIETY

A successful migration policy is fundamentally based on the successful integration of foreign workers into the local community. If the integration process is not properly established, the potential benefits of migration—for both migrants and host societies—cannot be fully realized. Given the complexity of the process, which includes economic, social, political, and cultural dimensions, coordinated efforts by government institutions, civil society, and employers are essential.

For successful integration, it is necessary to (UN DESA 2024):

- *Ensure access to the labor market*

Employment opportunities represent the first and most important step toward successful integration. Stable employment provides financial independence for foreign workers and enhances their social inclusion. Local society benefits from increased economic productivity.

However, this process can be challenging when migrants face legal and administrative barriers

to employment, language obstacles, or discrimination. To mitigate these effects, active labor market policies should be continuously implemented, including language courses and support in job searching and placement.

- *Promote social and cultural inclusion*

Beyond employment based on skills and qualifications, it is essential to support the inclusion of labor migrants into the local social fabric. This includes ensuring equal access to education, healthcare, and social services. All state actors are expected to take an active stance against discrimination and to promote mutual understanding. Integration is not a one-way process; local communities must also become more inclusive and adaptive. At the same time, foreign workers are expected to respect local institutions, laws, and norms. By adopting and implementing inclusive policies, social cohesion can be strengthened and marginalization and segregation minimized.

- *Provide education and language learning*

One of the key prerequisites for successful integration is knowledge of the local language. Without adequate language skills, migrants face limited access to education, employment, and public services. Therefore, host countries should offer language education systems for both adults and children. Integration policies must also ensure that migrant children can access the local education system without significant barriers. Additionally, systems for recognizing prior educational qualifications and providing vocational training programs should be established, allowing migrants to access suitable employment rather than remaining confined to low-paying jobs.

- *Strengthen legal protection and civic participation*

It is vital to protect migrants from exploitation and any form of workplace discrimination. The state must ensure fair treatment for all. Legal clarity regarding residence and work permits is fundamental for stability and long-term planning—for both migrants and employers. Furthermore, civic engagement, such as voting rights in local elections and participation in community institutions, strengthens the sense of belonging and contributes to democratic inclusion.

- *Minimize the impact of discrimination and xenophobia*

Foreign workers often face prejudice, stereotypes, or xenophobia, especially during periods of political instability or economic crisis. To reduce these negative impacts, active engagement is needed from governments and civil society through media, public discussions, and education to prevent the spread of misinformation. In this context, it is also necessary to strengthen anti-discrimination legislation.

## 5. SOUTHEAST EUROPE – THE CURRENT FRAMEWORK FOR LABOUR MIGRATION AND THE WAY FORWARD

Effective management of labour migration requires harmonized policies, legal alignment with European Union standards, and proactive, coordinated cooperation among various institutions. In this context—and considering the labor shortages faced by Southeast European countries—it is of crucial importance to establish strategic frameworks and institutional responses to address the complex issue of labour migration. All Southeast European countries, with the exception of Kosovo\*, hold EU candidate status (European Parliament 2025). The EU integration process itself provides a framework for aligning national migration policies with European standards.

To create an attractive environment for the arrival of foreign workers, the key negotiation chapters include: Chapter 2 (freedom of movement for workers), Chapter 19 (social policy and employment), Chapter 23 (judiciary and fundamental rights), Chapter 24 (justice, freedom and security), Chapter 26 (education and culture), and Chapter 28 (consumer and health protection). These chapters directly affect the rights of foreign workers and the obligations of host countries. Montenegro has opened all negotiation chapters, with one temporarily closed, while most other countries are still in the early stages of alignment (European Commission 2025).

The implementation of necessary reforms is lagging behind due to weak institutional coordination, limited administrative capacities, political instability, and a lack of financial resources. A strategic regional approach is needed to improve labour migration management through integrated

national migration policies with clearly defined objectives. Efforts must also be directed at strengthening regional cooperation through multilateral platforms, and enhancing the capacities of institutions responsible for labour migration and integration.

Understanding the specific nature of labour migration in each Southeast European country is the foundation for developing effective migration policies. Each country has unique migration trends, shaped by socio-economic conditions, labor market needs, political stability, and the level of engagement with its diaspora (DeHaan and Elbasani 2022).

### **5.1. Labour Migration in Bosnia and Herzegovina**

Bosnia and Herzegovina is one of the countries with the largest diaspora in the world relative to its population. It is estimated that around two million citizens live outside the country's borders (European Commission 2025). Labour migration from Bosnia and Herzegovina is primarily characterized by the emigration of the working-age population and educated professionals, driven by high unemployment rates—particularly among youth—low wages, and limited career development opportunities.

In recent years, there has been a noticeable increase in the number of foreign workers, especially in the construction, trade, and care sectors, with most coming from Turkey and Serbia. Between 2014 and 2023, an average of approximately 11,000 temporary residence permits were issued annually (Ministry of Security of BiH 2023).

To create adequate conditions for managing migration flows, the state adopted the Strategy on Migration and Asylum 2021–2025, which primarily addresses general migration issues—especially transit flows through the country—and the need to strengthen institutions responsible for border control and internal security. However, the segment of labour migration has been deprioritized and is not the main focus of the strategy. As a result, the legal framework for long-term integration and institutional support for labour migrants remains underdeveloped.

Considering that, in the second half of 2024, around 70,000 workers were lacking across all economic sectors (Federalna.ba 2024), Bosnia and Herzegovina will need to prioritize the issue of labour migration in the coming period. This also includes protecting fundamental rights, ensuring freedom of expression, and establishing a functional market economy to create an attractive environment for foreign workers. Accelerating the education reform process—based on competencies—is also of great importance, as it would foster the development of new skills that can support the economy.

### **5.2. Labour Migration in Serbia**

Serbia is the only country in the region that has adopted a strategy on economic migration for the period 2021–2027, with a particular focus on managing labour migration by improving living conditions to reduce the emigration of the working-age population. Furthermore, the strategy aims to develop a legal framework for attracting foreign workers with diverse expertise, while also encouraging circular migration. Procedures for obtaining work permits have been simplified to meet the growing demand in sectors such as agriculture, hospitality, and manufacturing. In this regard, the most recent amendments to the Law on Foreigners (2023) allow for temporary residence permits of up to three years for foreign nationals.

Nevertheless, there is still a need to establish a more comprehensive integration policy to retain and adequately support foreign labor. This is particularly important considering that Serbia faces a dual dynamic of emigration and immigration. On one hand, highly educated youth are leaving the country in search of better opportunities—with more than one million emigrants registered in 2020 (Integral Human Development 2025). On the other hand, Serbia is becoming an attractive destination for workers from the region, Asia, Eastern Europe, and other parts of the world. In 2022 and 2023, the highest number of temporary residence permits was issued to citizens of the Russian Federation, and there has also been an increase in the arrival of Chinese and Turkish nationals (Commissariat for Refugees and Migration RS 2023).

Regarding work permits, the majority issued between 2019 and 2023 went to Chinese nationals (36,036), and over 80% of all work permits were issued to men (Commissariat for Refugees and Migration RS 2023). Despite the recorded immigration, it is important to highlight that Serbia has

been experiencing a labor shortage for several years. According to the latest projections, the country will face a labor deficit of between 80,000 and 100,000 workers after 2030 (Nikolić et al. 2018).

To make the most of both domestic and foreign labor capacities, it is essential to strengthen a competency-based employment system and further align national requirements with Chapter 2 of the EU acquis, which addresses the free movement of workers (European Commission 2024).

### **5.3. Labour Migration in Montenegro**

Montenegro has not been spared from large-scale emigration. According to estimates from the International Organization for Migration, nearly one-third of the population lives abroad (IOM 2025). Although this is a significant number for a small country like Montenegro, strong ties with the diaspora have not been established, limiting the potential to harness the economic and social capital of Montenegrins living abroad.

Due to its seasonal economy, Montenegro is exposed to fluctuating labor demands, particularly in the tourism and hospitality sectors. Flexible labor migration policies have been introduced, and the country is working to ease the process of bringing in foreign workers through the signing of bilateral agreements with countries of origin. Despite a rise in the number of temporary work permits issued in recent years, the country still faces challenges in protecting the rights of foreign workers, ensuring access to healthcare, and providing accommodation for seasonal workers.

Labour migration is addressed within the general Strategy on Migration and Reintegration of Returnees in Montenegro for the period 2021–2025, but there is no specific policy document dedicated solely to economic migration. Considering that the Montenegrin Employers' Association forecasts a labor shortage by 2030, and that the Ministry of Tourism already highlighted in 2023 the need for 4,000 to 5,000 seasonal workers (Montenegro Business 2023), the issue of labour migration is becoming increasingly important for the country.

### **5.4. Labour Migration in North Macedonia**

North Macedonia is experiencing a high level of emigration, particularly among young professionals and skilled workers. According to UN data from 2019, the country had nearly 660,000 registered emigrants. Emigration is primarily directed toward Turkey and EU countries (Integral Human Development 2025). A moderate influx of labor from neighboring countries has been used to partially offset the effects of the brain drain.

A decline in the labor force is evident across all sectors, with agriculture, construction, and healthcare being the most affected. Between 2020 and 2022, 100,000 workers left the labor market (BalkanInsight 2023). The government is making efforts to implement reintegration programs for returnees and to strengthen diaspora ties in support of domestic development. However, targeted policies to attract and retain foreign workers are necessary to adequately address labor market shortages.

To establish a suitable framework for managing migration, North Macedonia adopted the Migration Strategy for the period 2021–2025. The adoption of this strategic document is important for addressing both national and regional demographic and development challenges. The urgency of the issue is also reflected in the fact that North Macedonia faces an annual shortage of 10,000 workers, which it is attempting to cover through the import of foreign labor (Osservatorio Balcani e Caucaso 2023).

### **5.5. Labour Migration in Albania**

Albania has one of the highest emigration rates in Europe (King and Vullnetari 2010). The government estimated that in 2020, 1.68 million people had emigrated, accounting for more than 50% of the total population (Integral Human Development 2025). In recent years, there has been noticeable progress toward importing labor, particularly in the construction and services sectors.

Through amendments to the Law on Foreigners and the establishment of bilateral cooperation with the Philippines, Albania is working to secure 40,000 foreign workers. Negotiations have also been initiated with Indonesia (Albanian Times 2025). The government needs to develop an effective economic migration policy aimed at creating a positive impact on the country's socio-economic development.

However, progress remains limited by high levels of corruption, an inadequately functioning judiciary, the absence of full fundamental freedoms, and the widespread presence of the informal economy (European Commission 2024).

### 5.6. Labour Migration in Kosovo\*

A significant outflow of the population due to high unemployment and political instability characterizes the territory of Kosovo\*. Between 2021 and 2022 alone, 110,000 people left the territory after obtaining work permits. Official estimates indicate that by the end of 2022, nearly 950,000 people were living outside the borders of Kosovo\*, which accounts for almost 54% of the total population (Ministry of Internal Affairs Kosovo\* 2023). This process accelerated following the liberalization of the visa regime with the EU at the beginning of 2024 and is expected to continue in the coming period (Kosovo\* Online 2023).

To mitigate the negative demographic changes, migration-related reforms have been initiated with the aim of making the territory more attractive to the labor force. However, for this process to be effective, it is necessary to strengthen institutional mechanisms focused on legal migration and integration. Furthermore, in order to create an attractive environment, it is essential to combat corruption at all levels of government, ensure the protection of fundamental rights, and establish mechanisms for safeguarding non-majority communities in the territory of Kosovo\* (European Commission 2024).

## 6. THE VISEGRÁD GROUP – A REGIONAL EXAMPLE OF SIGNIFICANT LABOUR MIGRATION

To understand how Southeast European countries can improve labour migration management, the experiences of the Visegrád Group countries (Poland, Czech Republic, Slovakia, and Hungary) have been analyzed. This analysis highlights both the challenges and opportunities in the area of labour migration, which can lead to positive demographic changes and help the region preserve and enhance economic productivity.

Poland is one of the most active EU countries in leveraging labour migration. Facing rapid population aging and an outflow of domestic labor, the government has launched efforts to attract foreign workers, primarily from Ukraine, Belarus, and Georgia. By adjusting procedures for expedited work permits and simplifying visa regimes, the country has seen significant migrant inflows. In 2021 alone, nearly 800,000 residence permits were issued—accounting for over 30% of all permits issued in the EU (Eurostat 2025). Poland's experience demonstrates that bilateral labor agreements, institutional readiness, and public-private sector coordination can turn migration into an economic advantage. Through the active implementation of such measures, a positive balance has been struck between the costs of bringing in foreign labor and the benefits to the local population and state. However, Poland currently faces institutional limitations in accommodating and integrating large numbers of migrants. Further efforts are needed to ensure quality education and healthcare services for foreign workers and to prevent exploitation in any form. In order to further tailor migration policies, statistical systems must be developed to collect data on migrants and their movements (Bojarczuk 2023).

The Czech Republic, facing labor shortages in key sectors such as manufacturing, introduced the “Ukraine Regime” (European Commission 2022), which simplifies visa and work permit procedures for selected nationalities. This policy is aimed at providing language support and orientation programs to better integrate workers into society. Despite positive economic outcomes, efforts to improve legal protection and the inclusion of foreign workers continue. Recent amendments to the Law on Foreigners established a new economic migration system (Blahoutová 2013), which offers more flexibility in managing labor migration. The aim is to focus on attracting highly qualified foreign workers, while lower-skilled labor may be engaged through circular migration programs. Although significant progress has been made in the area of economic migration, issues remain in terms of political inclusion, strengthening healthcare systems, and the recognition of foreign academic credentials (Blahoutová 2013).

Due to political sensitivity and public concerns regarding integration, Slovakia has taken a more cautious approach to labor migration. Negative demographic trends have pushed the government to relax restrictions, particularly in sectors such as agriculture, IT, and construction. Slovakia's slow response in adapting labour migration policies illustrates how missed opportunities can exacerbate

labor shortages and increase demographic pressure. Unlike other Visegrád countries, Slovakia only adopted a strategic document on foreign worker integration in 2014 (European Commission 2025). Although migrant inflows—especially from Ukraine amid the ongoing Russia-Ukraine conflict—are occurring, migrants face conditions where equal rights with locals are not guaranteed. Therefore, it is necessary to strengthen systems that ensure integration through equal rights, especially regarding employment based on qualifications and skills (European Commission 2025).

Hungary's migration policies often emphasize border control and the preservation of cultural identity. The government has allowed selective employment of foreigners, particularly through agency hiring from Southeast Asia. However, its restrictive rhetoric alongside pragmatic economic policies highlights the political complexity of managing labor migration. Despite the potential economic benefits, the lack of a comprehensive integration policy can limit long-term gains. The integration system needs to be adjusted toward skills-based employment, rather than relying solely on foreign workers to fill low-wage vacancies. With continued labor market liberalization, mechanisms must be strengthened to prevent exploitation and to support better integration through language education and social inclusion (Bodor 2024).

In all Visegrád Group countries, integration challenges remain significant. Migrants often work under precarious conditions and lack guaranteed long-term residency rights. The complexity of integration is evident through the exploitation of workers, various forms of discrimination, and fears over loss of national identity due to shrinking local populations. Despite these challenges, the Visegrád countries have made notable strides in migration reforms. Through the signing of bilateral and regional mobility agreements, they have facilitated the entry of foreign labor. Foundations have been laid for providing support both before and after arrival, and, in addition to government bodies, civil society organizations and employer representatives are actively involved in the process.

## CONCLUSION

Faced with demographic challenges such as declining birth rates, population aging, and continued emigration, Southeast European countries must take proactive measures to ensure long-term socioeconomic sustainability. Labour migration offers a potential pathway for demographic renewal and economic resilience. This analysis has examined the complexity of labour migration as a social phenomenon that can help mitigate labor shortages, generate fiscal revenue, and ease negative social trends. A comparative analysis with the Visegrád Group has emphasized the importance of actively managing economic migration and timely policy adaptation.

In order to harness the full potential of labor migration, and taking into account the experiences of the Visegrád Group countries, the countries of the region must adopt and actively implement long-term, integrated strategies that include:

- *Comprehensive labour migration policies*

It is necessary to develop economic migration strategies that are integrated with economic, labor market, and demographic planning. These strategies should help identify sector-specific labor market needs, align visa regimes with shortage occupations, and define measures to attract and retain foreign workers.

- *Improving institutional frameworks*

Effective management of labour migration requires functional and transparent institutions. Countries should establish dedicated agencies or departments for labour migration issues and enhance inter-institutional coordination among various government bodies. To ease administrative burdens, a digital platform for permit processing and data exchange should be developed.

- *Strengthening regional cooperation*

Labor market and demographic challenges transcend national borders. In this context, regional cooperation among Southeast European countries can facilitate labor mobility, harmonize standards on workers' rights and conditions, and support the creation of shared databases on migration flows and labor market needs.

- *Integration and rights protection*

When attracting foreign workers, successful integration into the local community is crucial to enabling migrants to realize their full potential in the new environment. Therefore, access to language learning, education, and healthcare must be ensured, alongside consistent efforts to combat discrimination and enforce labor rights protections. Social inclusion should also be supported through civic and cultural initiatives.

▪ *Strengthening diaspora engagement*

While the diaspora is often seen primarily as a source of remittances, it can also be leveraged as a developmental resource. In this context, circular migration programs should be promoted, with appropriate support for diaspora-led investments and entrepreneurship, and inclusion in policymaking processes.

▪ *Improving data analysis and processing systems*

Sound policy must be based on high-quality and timely data. It is essential to allocate resources for labor market research and demographic analysis. A system should be established to monitor the integration outcomes of foreign workers and make such statistics publicly available. By developing robust data collection and analysis systems, Southeast European countries will be able to adapt their migration strategies in a timely manner and respond more effectively to evolving challenges.

The successful integration of labour migration into national development plans should contribute not only to resolving demographic challenges but also to positioning the region as a competitive and inclusive destination for foreign workers. Appropriate measures must be taken, and action initiated before demographic trends become irreversible. Southeast European countries should actively implement strategic frameworks and intensify action plans with clearly defined measures in the area of labour migration. In doing so, they can attract foreign workers who, by filling labor market gaps, contribute to economic growth. Furthermore, highly skilled migrants bring expertise and knowledge that can enhance economic competitiveness—ultimately positioning Southeast Europe more favorably on the global map.

## REFERENCES

- Albanian Times. 2025. Albania to Ease Work Visa Rules for Foreign Nationals Amid Labor Shortages. Accessed April 12, 2025. <https://albaniantimes.al/albania-to-ease-work-visa-rules-for-foreign-nationals-amid-labor-shortages/>.
- BalkanInsight. 2023. Shrinking Labour Force Squeezes North Macedonia's Economy. Accessed April 12, 2025. <https://balkaninsight.com/2023/05/02/shrinking-labour-force-squeezes-north-macedonias-economy/>.
- Blahoutová, Tereza. 2013. An Overview of the Migration Policies and Trends – Czech Republic. Accessed March 25, 2025. <https://migrationonline.cz/en/an-overview-of-the-migration-policies-and-trends>.
- Bodor, Krisztofer. 2024. Foreign Workers in Hungary: Key Facts and Labor Market Challenges. Budapest: Friedrich-Ebert-Stiftung.
- Bojarczuk, Sara. 2023. Migration in Poland: Transition, Problems and Opportunities. Brussels: Fondation for European Progressive Studies.
- DeHaan, Heather, and Arolda Elbasani. 2022. "Migration and Statehood in the Western Balkans: A Post-Yugoslav Perspective." *Europe-Asia Studies* 74 (6): 1015–1033.
- European Commission. 2022. Czech Republic: "Lex Ukraine" Law Package Enters into Force. Accessed March 25, 2025. [https://migrant-integration.ec.europa.eu/library-document/czech-republic-lex-ukraine-law-package-enters-force\\_en](https://migrant-integration.ec.europa.eu/library-document/czech-republic-lex-ukraine-law-package-enters-force_en).
- European Commission. 2024. Albania 2024 Report. Accessed March 14, 2025. [https://enlargement.ec.europa.eu/document/download/a8eec3f9-b2ec-4cb1-8748-9058854dbc68\\_en](https://enlargement.ec.europa.eu/document/download/a8eec3f9-b2ec-4cb1-8748-9058854dbc68_en).
- European Commission. 2024. Kosovo 2024 Report\*. Accessed March 14, 2025. [https://enlargement.ec.europa.eu/document/download/c790738e-4cf6-4a43-a8a9-43c1b6f01e10\\_en](https://enlargement.ec.europa.eu/document/download/c790738e-4cf6-4a43-a8a9-43c1b6f01e10_en).
- European Commission. 2024. Serbia 2024 Report. Accessed March 14, 2025. [https://enlargement.ec.europa.eu/document/download/3c8c2d7f-bff7-44eb-b868-414730cc5902\\_en](https://enlargement.ec.europa.eu/document/download/3c8c2d7f-bff7-44eb-b868-414730cc5902_en).
- European Commission. 2025. Governance of Migrant Integration in Slovakia. Accessed March 25, 2025. [https://migrant-integration.ec.europa.eu/country-governance/governance-migrant-integration-slovakia\\_en](https://migrant-integration.ec.europa.eu/country-governance/governance-migrant-integration-slovakia_en).
- European Commission. 2025. Official EU Portal. Accessed March 10, 2025. [https://commission.europa.eu/index\\_en](https://commission.europa.eu/index_en).

- European Parliament. 2025. Fact Sheets on the European Union. Accessed March 10, 2025. <https://www.europarl.europa.eu/factsheets/>.
- Eurostat. 2025. Eurostat Statistics. Accessed March 20, 2025. <https://ec.europa.eu/eurostat/>.
- Federalna.ba. 2024. "U Bosni i Hercegovini u svim sektorima nedostaje oko 70.000 radnika." Accessed April 12, 2025. <https://federalna.ba/u-bosni-i-hercegovini-u-svim-sektorima-nedostaje-oko-70000-radnika-sbmwj>.
- Integral Human Development. 2025. Country Profile: Albania. Accessed March 11, 2025. <https://migrants-refugees.va/country-profile/albania/>.
- Integral Human Development. 2025. Country Profile: North Macedonia. Accessed March 11, 2025. <https://migrants-refugees.va/country-profile/north-macedonia/>.
- Integral Human Development. 2025. Country Profile: Serbia. Accessed March 11, 2025. <https://migrants-refugees.va/country-profile/serbia/>.
- IOM. 2025. Diaspora Engagement – Montenegro (Phase II). Accessed March 11, 2025. <https://www.iom.int/project/diaspora-engagement-sustainable-development-montenegro-phase-ii>.
- Ivlevs, Tanja. 2019. "Economic and Non-Economic Determinants of Migration Intentions in the Western Balkans." *International Migration* 57 (5): 270–287.
- King, Russell, and Julie Vullnetari. 2010. "Migration and Development in Albania and the Western Balkans: One-Way Ticket?" *Migration and Development* 8 (1): 29–57.
- Komesarijat za izbeglice i migracije RS. 2023. Migracioni profil Republike Srbije (2019–2023). Beograd: KIRS. Accessed March 14, 2025. <https://kirs.gov.rs/lat/migracije/migracioni-profil-republike-srbije>.
- Kosovo Online. 2023. Kosovo is Rapidly Losing its Workforce; What Follows after Visa Liberalization? Accessed April 12, 2025. <https://www.kosovo-online.com/en/news/analysis/kosovo-rapidly-losing-its-workforce-what-follows-after-visa-liberalization-29-10-2023>.
- Ministarstvo bezbjednosti BiH. 2023. Migracioni profil Bosne i Hercegovine (2014–2023). Sarajevo. Accessed March 12, 2025. <https://msb.gov.ba/dokumenti/arhiva/>.
- Ministry of Internal Affairs Kosovo\*. 2023. Annual Migration Profile 2022. Pristina: Government Authority for Monitoring Migration Movements.
- Montenegro Business. 2023. The Problem of Seasonal Employment – Montenegro Lacks up to 5,000 Workers. Accessed April 12, 2025. <https://montenegrobusiness.eu/the-problem-of-seasonal-employment-montenegro-lacks-up-to-5000-workers/>.
- Nikolić, Ivan, Goran Petrović, Milena Jovanović, Snežana Marković i Aleksandar Simić. 2018. „Zaposlenost u svetlu bržeg ekonomskog razvoja“. *Zaposlenost i rad u Srbiji u XXI veku*, 240 str. Beograd: Srpska akademija nauka i umetnosti.
- Osservatorio Balcani e Caucaso. 2023. North Macedonia: Low Wages and Labour Shortage. Accessed April 12, 2025. <https://www.balcanicaucaso.org/eng/Areas/North-Macedonia/North-Macedonia-low-wages-and-labour-shortage-224532>.
- Radelić, Branislav. 2021. "Labour Migration in the Western Balkans: Patterns, Drivers, and Policy Responses." *Journal of Balkan and Near Eastern Studies* 23 (5): 709–725.
- UN DESA, Population Division. 2024. International Migration and Sustainable Development. UN DESA/POP/2023/TR/NO. 7. New York: United Nations.
- United Nations. 1999. Resolution 1244. Accessed March 1, 2025. [https://unmik.unmissions.org/sites/default/files/old\\_dnn/Res1244ENG.pdf](https://unmik.unmissions.org/sites/default/files/old_dnn/Res1244ENG.pdf).
- United Nations. 2025. Population Data Portal. Accessed March 3, 2025. <https://population.un.org/dataportal/data/>.
- World Bank. 2025. World Development Indicators. Accessed March 2 and 3, 2025. <https://data.worldbank.org/>.
- Worldometer. 2025. World Population by Year. Accessed March 1, 2025. <https://www.worldometers.info/world-population/world-population-by-year/>.
- World Population Review. 2025. Country Demographics Overview. Accessed March 1, 2025. <https://worldpopulationreview.com/countries/>.





**Jelena Unković**

Trebinje,  
Bosnia and Herzegovina

✉ unkovicjelena@gmail.com

## COMPARATIVE ANALYSIS OF DIGITAL ECONOMY DEVELOPMENT IN THE REGION

### КОМПАРАТИВНА АНАЛИЗА РАЗВОЈА ДИГИТАЛНЕ ЕКОНОМИЈЕ У РЕГИОНУ

**Summary:** This paper analyzes the development of the digital economy in Southeast Europe, with a particular focus on Bosnia and Herzegovina. The digital economy serves as a framework for economic growth driven by information and communication technologies (ICT), the digitalization of business processes, and innovations in production and services. The aim of the paper is to present the current level of digital transformation, identify key challenges and opportunities, and assess the impact of digitalization on the labor market, productivity, and competitiveness. Through descriptive and comparative analysis with countries in the region, notably Serbia and Croatia, the paper highlights areas where Bosnia and Herzegovina lags behind and where it outperforms its peers. Bosnia and Herzegovina leads in ICT employment (4.8 %) compared to Croatia and Serbia (both 4.3 %), but lags in e-commerce (43.9 % versus 59.7 % in Serbia and 59.4 % in Croatia). Broadband penetration is very high (99.4 %), nearly equal to Serbia (100 %) and above Croatia (87.5 %). The paper concludes with policy recommendations emphasizing strategic investments in digital infrastructure, strengthening digital skills and the ICT sector, and stimulating e-commerce through legislative and economic measures.

**Keywords:** digital economy, Southeast Europe, Bosnia and Herzegovina, e-commerce, ICT employment.

**JEL classification:** O33, L86, F63

**Резиме:** Рад анализира развој дигиталне економије у Југоисточној Европи, са посебним освртом на Босну и Херцеговину. Дигитална економија представља оквир за економски раст заснован на информационо-комуникационим технологијама, дигитализацији пословних процеса и иновацијама у производњи и услугама. Циљ рада је приказати тренутни ниво дигиталне трансформације, идентификовати кључне изазове и прилике, те оцијенити утицај дигитализације на тржиште рада, продуктивност и конкурентност. Кроз дескриптивну и компаративну анализу са земљама региона, посебно Србијом и Хрватском, рад истиче гдје БиХ заостаје и гдје предњачи. Босна и Херцеговина предњачи у ИЦТ запослености (4,8%) у односу на Хрватску и Србију (по 4,3%), док заостаје у е-трговини (43,9% наспрам 59,7% у Србији и 59,4% у Хрватској). Бродбанд пенетрација је врло висока (99,4%), готово једнака Србији (100%) и изнад Хрватске (87,5%). Препоруке укључују: стратешка улагања у дигиталну инфраструктуру, јачање дигиталних вјештина и ИЦТ сектора, те стимулацију е-трговине кроз законодавне и економске мјере.

**Кључне ријечи:** дигитална економија, Југоисточна Европа, Босна и Херцеговина, е-трговина, ИКТ запосленост.

**JEL класификација:** O33, L86, F63

## INTRODUCTION

The digital economy represents one of the most dynamic and rapidly expanding sectors of the contemporary global market. Its emergence and evolution have significantly transformed traditional business models, labor market structures, and consumption patterns, while broadband Internet access, ICT employment, and e-commerce have become key indicators of digital transformation. Importantly, the digital economy transcends national borders, connecting countries and enabling their faster integration into global economic flows.

Southeast Europe, a region characterized by a complex historical, political, and economic background, currently stands at a crossroads in the development of its digital economy. Bosnia and Herzegovina, as one of the key countries in this region, faces unique opportunities as well as substantial challenges in its digital transformation process. A fragmented political system, uneven economic development, and infrastructural deficiencies are among the factors influencing the pace and efficiency of digitalization.

The main objective of this paper is to analyze the state of the digital economy in Southeast Europe, with a particular focus on Bosnia and Herzegovina. Special attention is devoted to identifying the key components of the digital economy that contribute to macroeconomic growth and competitiveness. The central research question addresses how and to what extent the digital economy affects the economic development of Southeast European countries, and how Bosnia and Herzegovina is positioned in comparison to its regional counterparts. The analysis is based on quantitative indicators, including the Digital Economy and Society Index (DESI), the ITU ICT Development Index, GDP per capita, and investment levels in the ICT sector, as well as on relevant strategic and legislative documents (e.g., *Strategy for the Development of Broadband Access in BiH*, *Law on Electronic Documents of BiH*). The methodological framework relies on a comparative analysis of countries in the region (Bosnia and Herzegovina, Serbia, Croatia, Montenegro, North Macedonia, and Albania), aiming to identify key trends, challenges, and opportunities in the process of digitalization.

The first section of the paper discusses the fundamental concepts of the digital economy and its significance in the contemporary world. The second section analyzes the state of the digital economy in Southeast Europe, with an emphasis on Bosnia and Herzegovina. The third section examines the challenges and opportunities of digital transformation in the region. The fourth section explores the impact of digitalization on the labor market and macroeconomic development. The fifth section presents a comparative analysis of the countries in the region. The sixth section provides concrete proposals and recommendations for improving the digital economy in Bosnia and Herzegovina, while the concluding section summarizes the main findings of the study.

This paper offers insights and recommendations intended for policymakers, business leaders, and the academic community to support the planning of digital development strategies. It highlights the key factors that constrain the development of the digital economy in Bosnia and Herzegovina and proposes potential solutions for overcoming these limitations.

## 1. THEORETICAL FRAMEWORK OF THE DIGITAL ECONOMY

The digital economy encompasses a set of economic activities based on the application of digital technologies and the Internet (Lazović 2018). This concept is not limited solely to the IT sector but refers to an entire ecosystem in which digital tools and processes transform traditional industries and business models. The key elements of the digital economy include digital platforms, e-commerce, digital services, and the infrastructure required to support them, such as broadband Internet, cloud computing, and mobile communications (Petrović 2022).

The digital economy is often divided into three interrelated components. The first component consists of digital platforms and services, which enable the exchange of goods and services via the Internet. This includes e-commerce, online banking, digital marketing, as well as platforms for remote work, social networks, and various applications (Jordanoski 2021). The second component is digital infrastructure, encompassing technical resources such as telecommunications networks, data centers, server equipment, and software systems (Commission, Country Profile: Bosnia and Herzegovina. European Innovation Scoreboard, 2024). Without developed infrastructure, access to digital services would be either limited or inefficient. The third component is digital literacy and skills, referring to the ability of individuals, businesses, and public institutions to effectively use digital technologies for work, learning, and innovation (Udruženje za digitalnu transformaciju 2023).

The macroeconomic significance of the digital economy lies in its capacity to enhance productivity and competitiveness. Digitalization facilitates faster information exchange, reduces production and distribution costs, improves access to international markets, and stimulates the creation of new products and services (Ristić 2025). Numerous studies have shown that countries successfully integrating digital technologies experience accelerated economic growth and higher innovation rates.

In a broader context, the digital economy also contributes to changes in the labor market. The emergence of new jobs in the IT sector, as well as the rise of digital platforms enabling freelancing and remote work, has altered traditional employment patterns and created opportunities for greater flexibility. At the same time, digital transformation can widen the gap between highly skilled and low-skilled workers, thus creating new challenges for social policy and education systems (Durmishi 2024).

In the context of Southeast Europe, the digital economy represents a significant potential driver of accelerated development (Durmishi 2024). Many countries in this region, including Bosnia

and Herzegovina, start from a relatively low base in terms of technological infrastructure and digital literacy, yet they are rapidly adapting to new technologies (UNDP 2023). For example, the growth of the IT sector in countries such as Serbia and Croatia demonstrates that the region possesses talented professionals and favorable conditions for the development of digital services and the export of software solutions.

However, digital transformation is not an automatic or obstacle-free process. Success in developing a digital economy depends on several factors, with institutional frameworks, legislation, and investments in infrastructure and education being the most crucial (Ministarsvo komunikacija i prometa BiH 2025). For instance, effective regulation can stimulate the growth of startups and attract foreign investments, while simultaneously protecting user rights and promoting market competition (European Commission 2024).

It is also essential to recognize that the digital economy can exacerbate existing inequalities, both among countries and within societies. The digital divide between urban and rural areas, between generations, or among educational groups can limit potential growth and create additional social challenges.

In conclusion, the digital economy constitutes a key driver of contemporary macroeconomic development. For Southeast European countries, including Bosnia and Herzegovina, the successful integration of digital technologies can significantly enhance competitiveness, innovation, and overall economic growth. Nevertheless, this process requires systematic and coordinated efforts at multiple levels—ranging from policy and education to infrastructure development and the promotion of entrepreneurship.

## 2. OVERVIEW OF THE DIGITAL ECONOMY IN SOUTHEAST EUROPE

Southeast Europe (SEE) comprises countries that have undergone complex political and economic transformations over the past decades. The region includes Serbia, Croatia, Bosnia and Herzegovina, Montenegro, North Macedonia, Albania, Kosovo, and Bulgaria. The digital economy in this part of Europe has experienced substantial development but continues to face challenges typical of transitional and developing economies.

### 2.1. General Trends and the State of the Digital Economy in SEE

Over the past decade, the digital economy has become one of the most important drivers of economic growth worldwide, and the SEE region is no exception. The increasing availability of the Internet and digital devices has enabled a growing number of users to access digital services (Ristić 2025). According to data from the International Telecommunication Union (ITU), the average Internet penetration rate in the region exceeds 70%, while in urban areas it can reach over 90%.

This expansion of Internet use has stimulated growth in e-commerce, digital banking, and the use of digital platforms for education, entertainment, and communication. The region has also witnessed significant growth in digital startups and technology companies targeting both local and global markets (Kacani 2024).

However, the digital economy is not equally developed across the region. Substantial disparities exist both between and within countries, for instance, digital literacy and infrastructure availability are considerably higher in urban centers than in rural areas. Moreover, the quality and speed of Internet connections remain below the European average in some areas, limiting the full development of digital services.

### 2.2. Development of Digital Infrastructure

Digital infrastructure represents the fundamental prerequisite for the development of the digital economy. It includes broadband Internet, telecommunications networks, data centers, and other technologies that enable data transmission and processing. In SEE, countries such as Croatia and Serbia have established solid foundations by investing heavily in broadband network development, whereas others, such as Bosnia and Herzegovina and Albania, still lag behind (Savić 2022).

These differences can be attributed to variations in political systems, economic capacity, and levels of foreign investment. For example, in Bosnia and Herzegovina, the complex multi-layered

governance structure at the state and entity levels hampers coordination in building digital infrastructure, thereby slowing down broadband Internet access in certain parts of the country (Ministarsvo komunikacija i prometa BiH 2025).

The European Union provides substantial financial assistance for improving digital infrastructure in the region through various funds and programs, especially in countries aspiring to EU membership (European Commission 2024). Projects aimed at developing 5G networks and strengthening the capacities of telecommunications companies are actively underway, helping to reduce the digital divide both within the region and between SEE and Western Europe.

### 2.3. Digital Literacy and Human Capital Development

Digital literacy, the ability to effectively use digital technologies, is one of the most crucial factors for successful digital transformation. Despite the growing interest in IT and digital skills across the SEE region, significant obstacles remain (Alfirević 2025).

Formal education systems in many countries are not fully aligned with the evolving requirements of the labor market. Many students lack access to quality courses that would prepare them for participation in the digital economy (Petrović 2022). There is also a pronounced generational gap: younger populations tend to be more digitally literate, while older cohorts face challenges in accessing and using new technologies.

As a response, various initiatives led by NGOs, the private sector, and public institutions are increasingly present across the region, providing training, workshops, and programs to enhance digital competencies. The rising number of IT firms and startups, particularly in Serbia, Croatia, and Slovenia, demonstrates that investments in human capital are gradually yielding tangible results (Durmishi 2024).

### 2.4. Key Sectors and Industries of the Digital Economy

The digital economy in the region is developing within several key sectors (Ristić 2025):

- *IT and Software Industry:* This sector records the fastest growth in the region. Serbia and Croatia are the leading countries, exporting software solutions worldwide. Bosnia and Herzegovina demonstrates considerable potential but faces challenges related to regulatory stability and institutional support.
- *E-Commerce:* Online sales have grown significantly, particularly in urban areas. However, issues such as logistics, consumer trust, and regulatory gaps continue to hinder broader market expansion.
- *Fintech and Digital Finance:* Mobile banking and digital wallets are gradually gaining popularity, though market penetration remains lower than in Western Europe. Nevertheless, the fintech sector holds substantial potential for innovation and growth.
- *Digital Media and Marketing:* An increasing number of companies utilize digital channels for advertising and consumer engagement, creating new dimensions of market competition and service development.

### 2.5. Political, Institutional, and Regulatory Challenges

Political complexity and institutional fragmentation constitute major barriers to digital economy development in SEE (UNDP 2023). Bosnia and Herzegovina is the most illustrative example; its multi-layered political structure complicates policy coordination and delays the adoption of unified digital strategies at the national level. This, in turn, slows infrastructure projects and the implementation of modern regulations.

Additionally, the absence of effective public policies and innovation support, together with bureaucratic inefficiencies, hampers the development of startups and digital services. In contrast, countries like Croatia, being EU members, benefit from regulatory alignment with European standards, which fosters the growth of the digital economy and ensures access to substantial financial resources (Savić 2022).

## 2.6. The Impact of European Integration and International Cooperation

The European Union plays a pivotal role in the development of the digital economy in Southeast Europe. Through various programs, funds, and technical assistance, the EU supports projects that enhance digital infrastructure, strengthen digital skills, and foster innovation. The *Digital Agenda for Europe*, regional development initiatives, and investments in research and innovation significantly contribute to reducing the digital divide between SEE and Western Europe (Jordanoski 2021).

For countries that are EU candidates or in the accession process, the harmonization of digital standards and legislation with EU frameworks presents both a challenge and an opportunity. The establishment of a unified digital market and adherence to cybersecurity standards open pathways for increased investment and the development of competitive digital services across the region.

## 3. DIGITAL CHALLENGES IN BOSNIA AND HERZEGOVINA

Bosnia and Herzegovina represents a distinctive case within Southeast Europe when it comes to the development of the digital economy. The country stands at the crossroads of European integration, characterized by a complex political and institutional structure that significantly influences economic dynamics and digital transformation (UNDP 2023). Despite notable potential, Bosnia and Herzegovina's digital economy faces a range of challenges that hinder its full integration into contemporary global trends.

### 3.1. Current State of the Digital Economy in Bosnia and Herzegovina

Over the past decade, Bosnia and Herzegovina has experienced gradual growth in its digital economy, particularly in the segments of IT services, e-commerce, and digital marketing. According to data from the Agency for Statistics of BiH and other relevant studies, approximately 68% of the population uses the Internet, comparable to the regional average, yet considerably below the European Union average (Savić 2022). Most users are concentrated in urban centers such as Sarajevo, Banja Luka, and Mostar.

Although relatively small compared to more developed economies, the IT sector in Bosnia and Herzegovina features several dynamic companies and startups that develop software solutions for both domestic and international markets. Cities like Sarajevo and Banja Luka are emerging as IT industry hubs, attracting talent from across the region and the Bosnian diaspora (Agencija za statistiku, 2023).

The e-commerce market is expanding but remains constrained by underdeveloped logistics infrastructure, low consumer trust in online shopping, and regulatory shortcomings. Online payments are still limited due to the slow adoption of digital banking and the insufficient use of electronic wallets (Agencija za statistiku BiH 2023).

### 3.2. Infrastructure Challenges

One of the most significant obstacles to the development of Bosnia and Herzegovina's digital economy is outdated and unevenly distributed digital infrastructure. While conditions are relatively good in larger cities, rural areas lag substantially behind in access to fast and reliable Internet. This contributes to the creation of a digital divide that deepens existing social and economic inequalities (B2BIT 2021).

Moreover, the multi-tiered governance system, with state, entity, and cantonal levels, leads to poor coordination in infrastructure development and digital policy implementation. This issue is further complicated by inconsistencies in legislation and administrative procedures, negatively affecting the efficiency and pace of digital project realization (Savić, 2022).

### 3.3. Regulatory Framework and Institutional Capacities

The regulatory framework for the digital economy in Bosnia and Herzegovina is still evolving and faces numerous challenges. The absence of clear and unified legislation governing e-commerce, data protection, and cybersecurity creates uncertainty for entrepreneurs and investors (Petrović, 2022).

While Bosnia and Herzegovina has adopted certain fundamental laws, such as the *Law on Electronic Signature* and the *Law on Personal Data Protection*, their implementation remains inconsistent across different administrative levels. Additionally, there is a lack of comprehensive policies and long-term strategies to support digital transformation.

Institutionally, agencies responsible for promoting and overseeing digital development often lack sufficient resources and capacity to operate effectively (B2BIT 2021). A stronger commitment from both state and entity governments is required to define and implement a coherent national digitalization strategy.

### 3.4. Digital Literacy and Education

The quality and accessibility of education in the field of digital technologies are key determinants of digital economy development. In Bosnia and Herzegovina, the education system faces challenges in modernizing curricula and adapting to the rapid pace of technological change.

Although several universities and private institutions offer IT-related courses and training, access to such programs remains limited, particularly outside major cities. Moreover, digital skills are insufficiently integrated into primary and secondary education.

A pronounced generational gap also exists, while younger populations tend to be digitally proficient, older generations often remain excluded from digital transformation processes. To address these gaps, widespread awareness campaigns and lifelong learning programs are essential.

### 3.5. Challenges and Potentials for Digital Economy Development

A major challenge lies in the lack of trust in digital services, especially in financial transactions. High levels of informality and consumer caution slow the expansion of e-commerce and digital payments (Savić 2022). Furthermore, limited access to capital and insufficient startup incentives hinder the growth of innovative digital enterprises.

On the other hand, Bosnia and Herzegovina possesses considerable potential for digital economy development, owing to the relatively high educational level of young IT professionals, the presence of a globally experienced diaspora, and the growing interest in digital technologies. The country's geographic proximity to the EU and participation in programs such as the *EU Digital Agenda* and *IPA funds* provide additional opportunities for funding, knowledge transfer, and institutional cooperation (Kacani 2024).

### 3.6. Prospects and Recommendations for Future Development

For the digital economy in Bosnia and Herzegovina to achieve its full potential, a coordinated, strategic approach is required, encompassing the following key steps (UNDP 2023):

- *Improvement of digital infrastructure:* Focus on reducing the digital divide between urban and rural areas through broadband network development and support for telecommunications operators.
- *Education system reform:* Integrate digital skills and programming into primary and secondary education, and establish programs for adult lifelong learning and upskilling.
- *Regulatory framework development:* Harmonize laws and standards at the national level to provide legal certainty for users, investors, and digital entrepreneurs.
- *Support for innovation and startups:* Establish funding mechanisms, tax incentives, and mentorship programs to foster innovation and entrepreneurial activity in the digital sector.
- *Building consumer trust:* Conduct public awareness campaigns to educate citizens on the benefits and security of digital services and online transactions.
- *Enhancement of institutional capacities:* Strengthen the role, resources, and competencies of state and entity-level institutions responsible for digital transformation.

Considering current trends and available resources, Bosnia and Herzegovina's digital economy has the potential to become a key driver of growth and competitiveness in the region—provided that existing challenges are addressed through strategic, coordinated, and inclusive policies.

## 5.7. Data Analysis

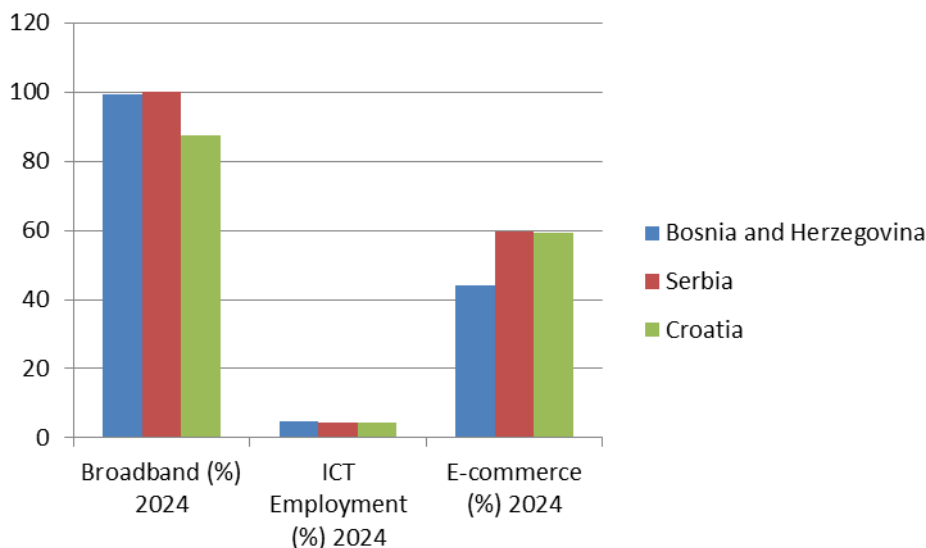
This section presents key digital economy indicators for Bosnia and Herzegovina in comparison with neighboring countries, Serbia and Croatia, for the period 2014–2024. The analysis focuses on broadband penetration, with data on ICT sector employment and e-commerce included where available. Data for other Southeast European countries, as well as for Croatia's e-commerce, were unavailable from reliable sources and therefore omitted from the table.

**Table 1: Digital Economy Indicators (2024)**

| Country                | Broadband (%)<br>2024 | ICT Employment (%)<br>2024 | E-commerce (%)<br>2024 |
|------------------------|-----------------------|----------------------------|------------------------|
| Bosnia and Herzegovina | 99.44                 | 4.8                        | 43.91                  |
| Serbia                 | 100.0                 | 4.3                        | 59.69                  |
| Croatia                | 87.53                 | 4.3                        | 59.39                  |

Source: Eurostat 2025

*Figure 1: Comparison of Digital Economy Indicators for Bosnia and Herzegovina, Serbia, and Croatia*



Source: adapted from Eurostat 2025

The figure presents key digital economy indicators for 2024, based on Eurostat data. Serbia records the highest broadband Internet usage rate (100%), while Bosnia and Herzegovina closely follows with 99.44%. Croatia lags behind in this segment, with a rate of 87.53%.

In terms of ICT sector employment, all three countries exhibit similar values, ranging between 4% and 5%. The most pronounced differences are observed in the field of e-commerce, where Serbia and Croatia have significantly higher shares of online users (around 59%), whereas Bosnia and Herzegovina considerably trails with 43.91%.

## 4. COMPARATIVE OVERVIEW OF DIGITAL ECONOMY DEVELOPMENT IN SOUTHEAST EUROPE

The digital economy in Southeast Europe (SEE) has become a topic of growing academic and policy interest, as the region holds substantial potential for technological progress and innovation, while also facing numerous challenges linked to its economic, political, and infrastructural complexity. This section compares the development of the digital economy in Bosnia and Herzegovina with that of neighboring and regional countries, specifically Serbia, Croatia, Slovenia, and North Macedonia (Durmishi 2024).

#### 4.1. Croatia as the Most Digitally Advanced Economy in the Region

Croatia is widely regarded as one of the regional leaders in digital economy development. Its EU membership since 2013 has granted access to structural funds and programs that promote digital transformation. The Croatian government actively implements digitalization strategies focused on infrastructure enhancement, e-government development, and startup ecosystem support (Eurostat 2025).

Croatia's digital infrastructure is relatively well developed, with high-speed Internet widely available across urban areas and much of the national territory. Digital literacy levels are increasing, while government support through tax incentives and grant schemes has created a favorable environment for innovation and entrepreneurship.

Nevertheless, challenges persist, including the digital divide between urban and rural regions and the need to improve digital competencies among older populations (Savić 2022). Overall, Croatia serves as a strong example of how EU integration and a coherent digital strategy can accelerate digital economy development.

#### 4.2. Serbia: Rapid IT Sector Growth and a Strong Startup Ecosystem

Serbia represents one of the most dynamic IT markets in Southeast Europe, recognized for its robust developer community and numerous IT companies successfully operating beyond national borders. Cities such as Belgrade, Novi Sad, and Niš have emerged as regional hubs for technological innovation and startups (Petrović 2022).

The country's digital infrastructure is rapidly expanding, supported by government initiatives aimed at modernizing telecommunications networks and deploying 5G technologies. Serbia's government also provides subsidies and incentives for IT firms, along with programs promoting coding and digital education among youth (Durmishi 2024).

However, Serbia still faces challenges related to its regulatory environment—particularly concerning data protection and e-commerce—where additional reforms are needed. Moreover, better alignment between the education system and labor market is required to bridge the skills gap.

#### 4.3. Slovenia: Integrated Digital Approach and Innovation Leadership

As an EU member state, Slovenia boasts one of the most advanced digital ecosystems in the region. Its digital transformation strategy encompasses a wide range of initiatives, from smart city development to digitalized public services and research and innovation promotion.

Slovenia's digital infrastructure is highly developed, with near-universal Internet access and high levels of digital literacy (Jordanoski 2021). The country also demonstrates effective collaboration between the private and public sectors in fostering digital innovation, evident in the success of numerous startups and tech enterprises.

Through EU membership, Slovenia has leveraged research and development funds and established programs supporting the internationalization of its IT sector. Nonetheless, challenges remain in adapting the labor market to rapid technological change and ensuring continuous workforce upskilling.

#### 4.4. North Macedonia: Expanding Digital Services and E-Governance

North Macedonia is undergoing an accelerated digital transformation, marked by significant investments in digital infrastructure and electronic services. The government has introduced e-governance reforms, improving public service accessibility and promoting digital literacy among citizens (Kacani 2024).

Although still in the developmental stage, the country's IT sector is growing steadily, particularly in software engineering and outsourcing. Educational initiatives targeting young people in IT fields are expanding, while international cooperation contributes to sectoral development.

Key challenges include administrative inefficiency, limited regulatory capacity, and constrained financial resources for infrastructure modernization. Moreover, bridging the digital divide between urban and rural areas remains a priority.

#### 4.5. Comparative Conclusions

A comparison of these countries with Bosnia and Herzegovina reveals that while all SEE nations share similar challenges and opportunities, EU membership emerges as a decisive advantage—providing access to financing, policy frameworks, and capacity-building programs. Serbia and Croatia lead in IT sector development, while Slovenia exemplifies a holistic digital transformation model.

Bosnia and Herzegovina, though rich in talented professionals and a growing IT base, must focus on improving infrastructure, regulation, and intergovernmental coordination. Learning from the experiences of neighboring countries can help Bosnia and Herzegovina accelerate its digital economy development and enhance competitiveness in the region.

### 5. THE IMPACT OF THE DIGITAL ECONOMY ON MACROECONOMIC DEVELOPMENT IN SOUTHEAST EUROPE

The digital economy is not merely a technological shift but a fundamental driver of macroeconomic development, influencing labor market structures, productivity, innovation, and overall economic growth. In Southeast Europe, digitalization holds significant implications for economic potential, competitiveness, and global integration (Todorović 2025).

#### 5.1. Increasing Productivity and Efficiency

One of the most important effects of digitalization is the increase in productivity across various sectors. The adoption of digital tools, software solutions, and automation enables companies to enhance efficiency, optimize resource management, and reduce production and distribution costs (Todorović 2025).

In SEE economies, firms that embrace digital technologies generally report higher revenue and export growth, particularly in sectors such as IT services, manufacturing, logistics, and finance (Alfirević 2025). The digital economy also facilitates easier access to international markets, thereby contributing to trade expansion and strengthening economic resilience.

#### 5.2. Labor Market Transformation and Employment

The digital economy significantly transforms labor market structures. The emergence of new jobs in IT, digital marketing, and e-commerce creates employment opportunities, especially for young and highly educated individuals.

However, digital transformation also brings challenges, automation can replace certain traditional occupations, creating the need for continuous workforce reskilling (Jordanoski 2021). In SEE countries, labor markets often struggle with digital skill shortages and a mismatch between educational programs and employer demands.

Countries that successfully integrate digital technologies can reduce youth unemployment and promote inclusive growth, whereas those that lag behind risk deepening existing socioeconomic disparities.

#### 5.3. Fostering Innovation and Entrepreneurship

The digital economy serves as a powerful catalyst for innovation and entrepreneurship. In SEE, IT startups and technology firms increasingly contribute to economic diversification and competitiveness, offering products and services capable of competing on global markets (Petrović 2022).

Countries investing in digital incubators, venture capital, and entrepreneurship education are more likely to develop sustainable innovation ecosystems. These initiatives not only boost economic growth but also enhance regional collaboration and knowledge exchange.

## 5.4. Impact on the Public Sector and Digital Governance

Digitalization also transforms public sector operations. The introduction of e-governance, digital administration, and open data initiatives enhances transparency, efficiency, and accountability while reducing corruption.

SEE countries that have implemented effective digital public services show higher levels of citizen trust in institutions and improved collaboration between government and the private sector. Such reforms are essential for building a favorable business environment and achieving sustainable economic development (Todorović 2025).

## CONCLUSION

The digital economy stands as one of the most significant drivers of contemporary macroeconomic development, particularly in Southeast Europe. Amid rapid technological change and global digitalization, the region's countries—including Bosnia and Herzegovina—face both substantial challenges and considerable opportunities to strengthen their economies.

The analysis demonstrates that EU membership and access to European funds can greatly accelerate digital transformation, as evidenced by Slovenia and Croatia. Conversely, non-EU countries such as Bosnia and Herzegovina and North Macedonia must intensify efforts to strengthen infrastructure, education, and regulatory frameworks to close the digital gap and create a favorable environment for digital development.

The impact of the digital economy on macroeconomic performance manifests through higher productivity, job creation, innovation, and improved public sector efficiency. However, this transformation requires systemic collaboration among government institutions, the private sector, and educational entities, alongside the adaptation of labor markets to new technological demands.

For Bosnia and Herzegovina, key challenges remain in improving coordination between government levels and enhancing capacities for digital education and innovation. Investment in digital infrastructure, IT sector growth, and the adoption of European standards could serve as critical drivers of accelerated development and regional competitiveness.

In conclusion, the digital economy should be viewed not only as a technological transition but also as a strategic opportunity for Southeast Europe to overcome structural barriers and achieve sustainable, inclusive, and innovation-driven economic growth. Continued reform efforts and investment in digital potential can significantly improve citizens' quality of life and ensure greater economic stability in the years to come.

## REFERENCES

- Agencija za statistiku Bosne i Hercegovine. 2023. *Upotreba informaciono-komunikacionih tehnologija u Bosni i Hercegovini, 2023*. Sarajevo. <https://bhas.gov.ba>.
- Alfirević, Ana M., Milan Petrović, and Helena Nemec Rudež. 2025. "Evaluating Digital Maturity in Higher Education Institutions." *Digital* 6(4): 130–148. <https://www.mdpi.com/2673-4060/6/4/130>.
- B2BIT. 2021. *Studija o digitalnoj transformaciji kompanija u BiH*. Sarajevo. <https://b2bit.ba/web-platforma-b2bit/>.
- Durmishi, Chamir T. 2024. "Integration of Digital Technologies by SMEs: Digital Economy Society Index – Bridging the Gap in the Western Balkans." *European Journal of Digital Innovation* 8(4): 277–293. <https://ojs.ikm.mk/index.php/kij/article/view/6563>.
- European Commission. 2024. *Country Profile: Bosnia and Herzegovina, European Innovation Scoreboard 2024*. Luxemburg. <https://ec.europa.eu/>.
- Eurostat. 2025. Accessed September 1. <https://ec.europa.eu/eurostat>.
- Jordanoski, Zoran, and Morten Meyerhoff Nielsen. 2021. "Measuring the Digital Economy and Society: A Study on the Application of the Digital Economy and Society Index in the Western Balkans." In *Proceedings of the International Conference on Electronic Governance (ICEGOV)*, 115–126. <https://dl.acm.org/doi/10.1145/3494193.3494220>.
- Kacani, Julinda. 2024. "Emerging ICT Clusters in the Western Balkans." *Journal of Business Research* 172: 113–125. <https://www.sciencedirect.com/science/article/pii/S1757780224001562>.

- Lazović, Vesna, and Tanja Đuričković. 2018. *Digitalna ekonomija*. Beograd: Miba Books.
- Ministarstvo komunikacija i prometa Bosne i Hercegovine. 2021. *Strategija razvoja širokopojasnog pristupa u Bosni i Hercegovini za period 2021–2025*. Sarajevo.
- Ministarstvo komunikacija i prometa Bosne i Hercegovine. 2025. *Zvanični portal Ministarstva komunikacija i prometa BiH*. <https://mkt.gov.ba>.
- Petrović, Milena, and Andreas Zuzaku. 2022. "Digital Transformation in the Western Balkans as an Opportunity for Small and Medium Enterprises (SMEs)." *Technology in Society* 71: 102151. <https://www.sciencedirect.com/science/article/pii/S2405896322030518>.
- Ristić, Marko, and Jelena Vuković. 2025. "Digital Transformation as a Starter of the Creation of New Economic Business Models." *Journal of Digital Business Studies* 12(1): 33–48. [https://www.researchgate.net/publication/388589001\\_Digital\\_Transformation\\_as\\_a\\_Starter\\_of\\_the\\_Creation\\_of\\_new\\_Economic\\_Business\\_Models](https://www.researchgate.net/publication/388589001_Digital_Transformation_as_a_Starter_of_the_Creation_of_new_Economic_Business_Models).
- Savić, Ljiljana. 2022. "Digitalna transformacija ekonomija Zapadnog Balkana – izazovi i prilike." *Zbornik radova Ekonomskog fakulteta u Istočnom Sarajevu* 24: 15–28.
- Službeni glasnik Bosne i Hercegovine. 2014. *Zakon o elektronskom dokumentu Bosne i Hercegovine*. *Službeni glasnik BiH*, br. 58/14.
- Službeni glasnik Bosne i Hercegovine. 2025. *Zvanični portal Službenog glasnika BiH*. <https://www.sluzbenilist.ba>.
- Straživuk, Dragana, and Milorad Radivojević. 2015. *Digitalna ekonomija*. Gradiška: Visoka škola PRIMUS.
- Todorović, Aleksandar, and Klara Jovanović. 2025. "Artificial Intelligence in the Western Balkans: Economic Impact, Ethical Challenges, and Regulatory Frameworks." *Journal of Information Systems & e-Management (JISem)* 9(2): 201–219. <https://jisem-journal.com/index.php/journal/article/view/7143/3288>
- Udruženje za digitalnu transformaciju. 2023. *Studija: Digitalna pismenost stanovništva BiH*. Sarajevo. <https://www.udt.ba/>.
- UNDP Bosna i Hercegovina. 2023. *Digitalna transformacija u javnom sektoru u BiH*. Sarajevo. <https://www.undp.org/bs/bosnia-herzegovina>.





## BRIEFLY ABOUT THE JOURNAL

*The Proceedings of the Faculty of Economics in East Sarajevo* - Journal of Economics and Business (Зборник радова Економског факултета у Источном Сарајеву) is a scientific publication of the Faculty. It has been published once a year since 1994 in continuity.

The journal was, according to the Ministry of Science and Technology Republic of Srpska, won 34 out of a possible 40 points, and thus classified in the first category of scientific journals.

The Proceedings of the Faculty of Economics in East Sarajevo is announced the best scientific and professional journal in Republic of Srpska for 2012.

The Proceedings publishes the papers of the scholars from the Faculty of Economics in East Sarajevo and outside the Faculty as well. The papers refer to the broad area of economic science, and their main prerequisites are scientific contributions to economic theory and practice. The papers can be of theoretical and methodological-analytical nature, and may include areas ranging from national economic policies to business policy. Most manuscripts are written in Serbian language. However, manuscripts written in other languages (English, German, French, Croatian, Russian and other Slavic languages) are accepted as well.

The concept, goals and strategy of the Proceedings are guided by the Editorial Board of the Proceedings.

The Journal is indexed in SCIRUS (SCIRUS for Scientific information only); BASE (BASE – Bielefeld Academic Search Engine), Bielefeld University Library, Germany; EBSCO Publishing, Ipswich, USA; JEL (Journal of Economic Literature) / EconLit (American Economic Association's Electronic Database), Pitsburg, USA. Since 2009 it has been indexed in bases of DOAJ (Directory of Open Access Journals), Lund University, Sweden; C.E.E.O.L (Central and Eastern European Online Library), Frankfurt am Main, Germany; CABELL'S Directories (Cabell's Directories of Publishing Opportunities), Texas, USA; Index Copernicus, Warsaw, Poland; Google Scholar, Mountain View, California.

Authors are especially expected to contribute to scientific work and research in the following areas:

- Monitoring of the latest developments in the field of economics and their applicability in solving the development problems of the Bosnia-Herzegovina economy;
- Exploring the role of higher economic education in economic development and positioning of the Faculty within the state, market and civil society in terms of integration processes;
- The position of small countries in terms of integration processes in Europe and the globalization processes in the world;
- Analysis of growth factors and structural changes in the economy of BiH-RS;
- Ensuring continued balanced growth of the economy of Bosnia and Herzegovina;
- Removing barriers to economic development, raising the quality of life of citizens and environmental protection;
- Comparative analysis of the development of neighboring countries and analysis of the comparative competitiveness of the economy;
- Compliance of financial and real sectors of the economy;
- Research and forecasting market conditions;
- Methods to improve entrepreneurship, business efficiency and competitiveness of enterprises;
- The efficiency of the market and the state and the construction of a representative institutional infrastructure.

Editorial Board reserves the right to return to the author the texts that do not comply with the criteria of the guidelines, or to adapt the papers completely in line with the Proceedings rules and prescribed standards of Serbian language, or foreign languages. There are no further requirements for the authors concerning other technical elements of text editing. The final decision on publication of papers and their priority order is made by the Proceedings Editorial Board.

The Journal is open for cooperation with scientists from BiH and abroad all year round. All contributions to economic theory and practice are always welcome.

**Note:**

E-mail address for submission of entries is: *zrefis@ekofis.ues.rs.ba*

In addition to e-mail, the paper can also be submitted in person or by mail containing a hard copy together with CD or USB. The CD or USB should be labeled with the name of the author and the paper title.

The address is to be submitted to the following address:

*University of East Sarajevo*  
*Faculty of Economics Pale*  
„Proceedings of the Faculty of Economics in East Sarajevo”  
Alekse Santica 3  
71420 Pale  
Bosnia and Herzegovina

Contact address: *zrefis@ekofis.ues.rs.ba*

**YOU ARE WELCOME TO CONTACT US**

## INSTRUCTIONS FOR AUTHORS

The Proceedings of the Faculty of Economics in East Sarajevo (*Зборник радова Економског факултета у Источној Сарајеву*) is an economic journal with a general orientation and it is published yearly. We publish original scientific papers, scientific reviews, preliminary reports, conference papers, professional papers and book reviews. Only original papers not previously published or simultaneously submitted for publishing elsewhere, should be submitted. Submitted papers need to be prepared according to the The Proceedings of the Faculty of Economics in East Sarajevo Instructions for Authors.

Papers should be submitted electronically, as an open document (Word and PDF format), [zrefis@ekofis.ues.rs.ba](mailto:zrefis@ekofis.ues.rs.ba), in due time. Submissions that do not reach the scheduled date or do not meet the recommendations in the Instructions will not be submitted for review and will not be published in the Proceedings.

**Authors should strictly adhere to the submission instructions for authors. Papers that do not adhere to the instructions will not enter the reviewing process.**

A paper must be written in text processor *Microsoft Word*, using font *Times New Roman* (size 12), in the Cyrillic alphabet, spacing (1). **Page setup:** A4, Margins: top 2 cm; bottom 2 cm; left 2,5 cm; right 2,5 cm. Paper needs to have the length of up to 30,000 characters (16 pages). The exception from this are reviews which may be up to 50,000 characters long. A paper needs to be proof read.

**Paper title.** In the upper left corner there should be the family name, title and author's name (*Times New Roman*, 12). Example: Last name PhD (MA.) name or last name and name, BSc in Economics. The footnote on the first page shows scientific title of the author, name and address of the institution the author is employed with as well as the e-mail address of the author. The precise title of the paper (TNR, 14, bold) is three spaces below, in the middle of the page, written in capital letters.

**Summary.** Summary, with the length of 50-150 words, should be at the beginning of the paper, under the title, two spaces below (TNR, 11, italic). Key words are at the end of the summary, a single line below (up to five key words). At least one classification code of the Classification System for the Journal Articles, as used by the Journal of Economic Literature (JEL: [http://www.aeaweb.org/journal/jel\\_class\\_system.php](http://www.aeaweb.org/journal/jel_class_system.php)), should be included, also a single line below.

### Headings and subheadings.

- a) INTRODUCTION (TNR, 12, bold), text TNR 12, two spaces after keywords.
- b) The main headings in the paper should be TNR 12, in capital letters, bold, aligned to the left margin. Among the titles in the paper there should be a single blank line. Main headlines are marked by ordinal number 1.; 2., etc..
- c) Subtitles, the second level, TNR 12, bold, aligned to the left margin.
- d) Subtitles, third level, TNR 12, aligned to the left margin.
- e) CONCLUSION (TNR, 12, bold), text TNR 12.

**Language of the paper.** Papers shall be submitted in English and Serbian (Croatian, Bosnian) language.

**Summary in English.** In the top left corner is the name and surname of the author (TNR, 12). Three spaces below is the TITLE OF THE PAPER in English (TNR, 14, bold). Then, two spaces below follows the Summary (TNR 12, bold), followed by text (TNR 11, italic). After the text, a single line below are Key words (TNR 12, bold): Key word 1, key word 2, ... key word 5 (TNR 11, italic) and a single space below JEL classification (TNR 12, bold): E04, B12 (TNR 11, italic).

**The Proceedings of the Faculty of Economics in East Sarajevo uses THE CHICAGO MANUAL OF STYLE (AUTHOR – DATE SYSTEM).**

**Reference to individuals, articles and book in the text – Basic structure of an in-text citation.** Citation in the text usually appears in parentheses and includes only the first two elements in a reference list—the author and the year of publication (hence the name of the system), with no intervening punctuation. In addition, a page number or other locator may be added, following a comma. Terms such as editor or translator, abbreviated in a reference list, are not included in a text citation.

**Quotations.** Any quotation, regardless of its length, needs to be followed by reference including page number. For any quotation longer than 350 characters, an author must have written approval by copy rights owner that needs to be enclosed.

**Tables, charts, and pictures.** Tables and graphs need to be made in *Word* or some other Word compatible format. Tables and graphs from statistical programs should be transferred into Word format. Same data may not be presented both in tables and charts. Every table, chart, or picture should be marked with number and adequate name, e.g.: Table 2: The Reliability of the Variables. The name of the table, graphic or image is placed above, TNR 11, normal, two lines between the table and the text. Pictures need to be sent in electronic form with the resolution of at least 300 dpi. If illustration from printing source is used, written authorization by copy rights owner is necessary. Source should be placed below tables, charts, and pictures. Quotations in the given Source are used in the same way as in the text. If the tables, charts, and figures are author'(s) calculations, reviews or estimations, that should also be emphasized.

**Statistics.** The results of statistical tests need to be provided in the following form:  $F(1.9) = 25.35$ ;  $p < .001$  or similar. Lower numbers of conventional P levels should also be stated (e.g.: .05, .01, .001).

**References.** The Proceedings of the Faculty of Economics in East Sarajevo uses **The Chicago Manual of Style** for references. Reference section must be single-spaced, beginning on a new page following the text, giving full information. Use full names of authors or editors using initials only if that is the usage of the particular author/editor. List all author/editors up to/ including 10 names. Authors of articles and books and material without specific authors or editors, such as government documents, bulletins, or newspapers, are to be listed alphabetically. Most references in the Reference section should be referenced (included) in the text.

**Appendix.** In the appendix, only those descriptions of material that would be useful for readers to understand, evaluate, or revise research should be provided.

**Footnotes and abbreviations.** Footnotes should be avoided. If necessary, references in the footnotes should be used in the same way as in the text. Abbreviations should also be avoided, except from exceptionally usual ones. The abbreviations stated in tables and pictures should be explained.

**Reviews and publishing.** All papers are anonymously reviewed by two anonymous reviewers. On the basis of reviews, the editorial staff makes decision on paper publishing and informs the author.

## THE CHICAGO MANUAL OF STYLE - AUTHOR-DATE SYSTEM

The following examples illustrate the author-date system. Each example of a reference list entry is accompanied by an example of a corresponding in-text citation. For more details and many more examples, see [chapter 15](#) of *The Chicago Manual of Style 17*.

### BOOK

#### Reference list entries (in alphabetical order)

Grazer, Brian, and Charles Fishman. 2015. *A Curious Mind: The Secret to a Bigger Life*. New York: Simon & Schuster.

Smith, Zadie. 2016. *Swing Time*. New York: Penguin Press.

#### In-text citations

(Grazer and Fishman 2015, 12)

(Smith 2016, 315–16)

For more examples, see [15.40–45](#) in *The Chicago Manual of Style*.

#### Two or more authors

In references:

Ward, Geoffrey C., and Ken Burns. 2007. *The War: An Intimate History, 1941–1945*. New York: Knopf.

In text:

(Ward and Burns 2007, 52)

For four or more authors, list all of the authors in the reference list; in the text, list only the first author, followed by *et al.* (“and others”):

In references:

Johnson, Norine G., Michael C. Roberts, and Judith Worell. 2001. *Beyond Appearance: a New Look at Adolescent Girls*. Washington, DC: American Psychological Association.

In text:

(Johnson et al. 2010)

### **CHAPTER OR OTHER PART OF AN EDITED BOOK**

In the reference list, include the page range for the chapter or part. In the text, cite specific pages.

#### **Reference list entry**

Thoreau, Henry David. 2016. “Walking.” In *The Making of the American Essay*, edited by John D’Agata, 167–95. Minneapolis: Graywolf Press.

#### **In-text citation**

(Thoreau 2016, 177–78)

In some cases, you may want to cite the collection as a whole instead.

#### **Reference list entry**

D’Agata, John, ed. 2016. *The Making of the American Essay*. Minneapolis: Graywolf Press.

#### **In-text citation**

(D’Agata 2016, 177–78)

For more details, see [15.36](#) and [15.42](#) in *The Chicago Manual of Style*.

### **TRANSLATED BOOK**

#### **Reference list entry**

Lahiri, Jhumpa. 2016. *In Other Words*. Translated by Ann Goldstein. New York: Alfred A. Knopf.

#### **In-text citation**

(Lahiri 2016, 146)

### **E-BOOK**

For books consulted online, include a URL or the name of the database in the reference list entry. For other types of e-books, name the format. If no fixed page numbers are available, cite a section title or a chapter or other number in the text, if any (or simply omit).

#### **Reference list entries (in alphabetical order)**

Austen, Jane. 2007. *Pride and Prejudice*. New York: Penguin Classics. Kindle.

Borel, Brooke. 2016. *The Chicago Guide to Fact-Checking*. Chicago: University of Chicago Press. ProQuest Ebrary.

Kurland, Philip B., and Ralph Lerner, eds. 1987. *The Founders’ Constitution*. Chicago: University of Chicago Press. <http://press-pubs.uchicago.edu/founders/>.

Melville, Herman. 1851. *Moby-Dick; or, The Whale*. New York: Harper & Brothers. <http://mel.hofstra.edu/moby-dick-the-whale-proofs.html>.

#### **In-text citations**

(Austen 2007, chap. 3)

(Borel 2016, 92)

(Kurland and Lerner 1987, chap. 10, doc. 19)

(Melville 1851, 627)

**JOURNAL ARTICLE**

In the reference list, include the page range for the whole article. In the text, cite specific page numbers. For articles consulted online, include a URL or the name of the database in the reference list entry. Many journal articles list a DOI (Digital Object Identifier). A DOI forms a permanent URL that begins <https://doi.org/>. This URL is preferable to the URL that appears in your browser's address bar.

**Reference list entries (in alphabetical order)**

Keng, Shao-Hsun, Chun-Hung Lin, and Peter F. Orazem. 2017. "Expanding College Access in Taiwan, 1978–2014: Effects on Graduate Quality and Income Inequality." *Journal of Human Capital* 11, no. 1 (Spring): 1–34. <https://doi.org/10.1086/690235>.

LaSalle, Peter. 2017. "Conundrum: A Story about Reading." *New England Review* 38 (1): 95–109. Project MUSE.

Satterfield, Susan. 2016. "Livy and the *Pax Deum*." *Classical Philology* 111, no. 2 (April): 165–76.

**In-text citations**

(Keng, Lin, and Orazem 2017, 9–10)

(LaSalle 2017, 95)

(Satterfield 2016, 170)

Journal articles often list many authors, especially in the sciences. If there are four or more authors, list up to ten in the reference list; in the text, list only the first, followed by *et al.* ("and others"). For more than ten authors (not shown here), list the first seven in the reference list, followed by *et al.*

**Reference list entry**

Bay, Rachael A., Noah Rose, Rowan Barrett, Louis Bernatchez, Cameron K. Ghalambor, Jesse R. Lasky, Rachel B. Brem, Stephen R. Palumbi, and Peter Ralph. 2017. "Predicting Responses to Contemporary Environmental Change Using Evolutionary Response Architectures." *American Naturalist* 189, no. 5 (May): 463–73. <https://doi.org/10.1086/691233>.

**In-text citation**

(Bay et al. 2017, 465)

For more examples, see [15.46–49](#) in *The Chicago Manual of Style*.

**NEWS OR MAGAZINE ARTICLE**

Articles from newspapers or news sites, magazines, blogs, and the like are cited similarly. In the reference list, it can be helpful to repeat the year with sources that are cited also by month and day. Page numbers, if any, can be cited in the text but are omitted from a reference list entry. If you consulted the article online, include a URL or the name of the database.

**Reference list entries (in alphabetical order)**

Manjoo, Farhad. 2017. "Snap Makes a Bet on the Cultural Supremacy of the Camera." *New York Times*, March 8, 2017. <https://www.nytimes.com/2017/03/08/technology/snap-makes-a-bet-on-the-cultural-supremacy-of-the-camera.html>.

Mead, Rebecca. 2017. "The Prophet of Dystopia." *New Yorker*, April 17, 2017.

Pai, Tanya. 2017. "The Squishy, Sugary History of Peeps." *Vox*, April 11, 2017. <http://www.vox.com/culture/2017/4/11/15209084/peeps-easter>.

Pegoraro, Rob. 2007. "Apple's iPhone Is Sleek, Smart and Simple." *Washington Post*, July 5, 2007. LexisNexis Academic.

**In-text citation**

(Manjoo 2017)

(Mead 2017, 43)

(Pai 2017)

(Pegoraro 2007)

Readers' comments are cited in the text but omitted from a reference list.

### **In-text citation**

(Eduardo B [Los Angeles], March 9, 2017, comment on Manjoo 2017)

For more examples, see 15.49 (newspapers and magazines) and 15.51 (blogs) in *The Chicago Manual of Style*.

## **BOOK REVIEW**

### **Reference list entry**

Kakutani, Michiko. 2016. "Friendship Takes a Path That Diverges." Review of *Swing Time*, by Zadie Smith. *New York Times*, November 7, 2016.

### **In-text citation**

(Kakutani 2016)

## **INTERVIEW**

### **Reference list entry**

Stamper, Kory. 2017. "From 'F-Bomb' to 'Photobomb,' How the Dictionary Keeps Up with English." Interview by Terry Gross. *Fresh Air*, NPR, April 19, 2017. Audio, 35:25.  
<http://www.npr.org/2017/04/19/524618639/from-f-bomb-to-photobomb-how-the-dictionary-keeps-up-with-english>.

### **In-text citation**

(Stamper 2017)

## **THESIS OR DISSERTATION**

### **Reference list entry**

Rutz, Cynthia Lillian. 2013. "*King Lear* and Its Folktale Analogues." PhD diss., University of Chicago.

### **In-text citation**

(Rutz 2013, 99–100)

## **WEBSITE CONTENT**

It is often sufficient simply to describe web pages and other website content in the text ("As of May 1, 2017, Yale's home page listed . . ."). If a more formal citation is needed, it may be styled like the examples below. For a source that does not list a date of publication or revision, use *n.d.* (for "no date") in place of the year and include an access date.

### **Reference list entries (in alphabetical order)**

Bouman, Katie. 2016. "How to Take a Picture of a Black Hole." Filmed November 2016 at TEDxBeaconStreet, Brookline, MA. Video, 12:51. [https://www.ted.com/talks/katie\\_bouman\\_what\\_does\\_a\\_black\\_hole\\_look\\_like](https://www.ted.com/talks/katie_bouman_what_does_a_black_hole_look_like).

Google. 2017. "Privacy Policy." Privacy & Terms. Last modified April 17, 2017.  
<https://www.google.com/policies/privacy/>.

Yale University. n.d. "About Yale: Yale Facts." Accessed May 1, 2017. <https://www.yale.edu/about-yale/yale-facts>.

### **In-text citations**

(Bouman 2016)

(Google 2017)

(Yale University, n.d.)

For more examples, see 15.50–52 in *The Chicago Manual of Style*. For multimedia, including live performances, see 15.57.

### ***SOCIAL MEDIA CONTENT***

Citations of content shared through social media can usually be limited to the text (as in the first example below). If a more formal citation is needed, a reference list entry may be appropriate. In place of a title, quote up to the first 160 characters of the post. Comments are cited in reference to the original post.

#### **Text**

Conan O'Brien's tweet was characteristically deadpan: "In honor of Earth Day, I'm recycling my tweets" (@ConanOBrien, April 22, 2015).

#### **Reference list entries (in alphabetical order)**

Chicago Manual of Style. 2015. "Is the world ready for singular they? We thought so back in 1993." Facebook, April 17, 2015. <https://www.facebook.com/ChicagoManual/posts/10152906193679151>.

Souza, Pete (@petesouza). 2016. "President Obama bids farewell to President Xi of China at the conclusion of the Nuclear Security Summit." Instagram photo, April 1, 2016. <https://www.instagram.com/p/BDrmfXTtNCt/>.

#### **In-text citations**

(Chicago Manual of Style 2015)

(Souza 2016)

(Michele Truty, April 17, 2015, 1:09 p.m., comment on Chicago Manual of Style 2015)

### ***PERSONAL COMMUNICATION***

Personal communications, including email and text messages and direct messages sent through social media, are usually cited in the text only; they are rarely included in a reference list.

#### **In-text citation**

(Sam Gomez, Facebook message to author, August 1, 2017)

**The author receives a copy of the Proceedings in which his/her paper was published. Only those papers that are written in accordance with the above guidelines will be sent for review. For reviewers, the papers are anonymous.**

# CALL FOR PAPER

## *Proceedings of the Faculty of Economics in East Sarajevo* *Journal of Economics and Business*

---

ISSN: 1840-3557 e-ISSN: 1986-6690 UDC: 33 COBISS. RS-ID: 16736262

DOI: <https://doisrpska.nub.rs/index.php/zrefis/issue/archive>

*The Proceedings of the Faculty of Economics in East Sarajevo* - Journal of Economics and Business (Зборник радова Економског факултета у Источном Сарајеву) is a scientific publication of the Faculty. It has been published once a year since 1994 in continuity.

The journal was, according to the Ministry of Science and Technology Republic of Srpska, won 34 out of a possible 40 points, and thus classified in the first category of scientific journals.

The Proceedings of the Faculty of Economics in East Sarajevo is announced the best scientific and professional journal in Republic of Srpska for 2012. The Proceedings publishes the papers of the scholars from the Faculty of Economics in East Sarajevo and outside the Faculty as well. The papers refer to the broad area of economic science, and their main prerequisites are scientific contributions to economic theory and practice. The papers can be of theoretical and methodological-analytical nature, and may include areas ranging from national economic policies to business policy.

The concept, goals and strategy of the journal are guided by the Editorial Board..

The Journal is indexed in ERIH Plus, Bergen, Norway; Sherpa Romeo – JISC, United Kingdom; DOAJ - Directory of Open Access Journals, Hovedstaden, Denmark; ProQuest, Ann Arbor, Michigan, U.S.; Google Scholar; EBSCO Publishing, Ipswich; INDEX COPENICUS International, Warsaw, Poland; CABELL'S Directories (Cabell's Directories of Publishing Opportunities), Texas, USA; C.E.E.O.L (Central and Eastern European Online Library), Frankfurt am Main, Germany; BASE (BASE – Bielefeld Academic Search Engine), Bielefeld University Library, Germany; JEL (Journal of Economic Literature) / EconLite, (American Economic Association's Electronic Database), Pittsburg, USA; DOI Srpska, Banja Luka; CrossRef, Oxford, United Kingdom.

Editorial Board reserves the right to return to the author the texts that do not comply with the criteria of the guidelines, or to adapt the papers completely in line with the Proceedings rules and prescribed standards of Serbian language, or foreign languages. There are no further requirements for the authors concerning other technical elements of text editing. The final decision on publication of papers and their priority order is made by the Proceedings Editorial Board.

Papers shall be submitted in English language. The Proceedings of the Faculty of Economics in East Sarajevo uses THE CHICAGO MANUAL OF STYLE (AUTHOR – DATE SYSTEM).

The Journal is open for cooperation with scientists from BiH and abroad all year round. All contributions to economic theory and practice are always welcome.

**E-mail address for submission of entries is:** [zrefis@ekofis.ues.rs.ba](mailto:zrefis@ekofis.ues.rs.ba)

**All information you can find on internet address of journal:** <http://www.zrefis.ekofis.ues.rs.ba>

**Address:** University of East Sarajevo, Faculty of Economics Pale  
Alekse Santica 3, 71420 Pale, Bosnia and Herzegovina

## YOU ARE WELCOME TO CONTACT US



Visit us

<http://www.zrefis.ekofis.ues.rs.ba>

## Scientific Journal ZREFIS

Search ...

Home

Current Issue

Archive

Submission

Guidelines

Review

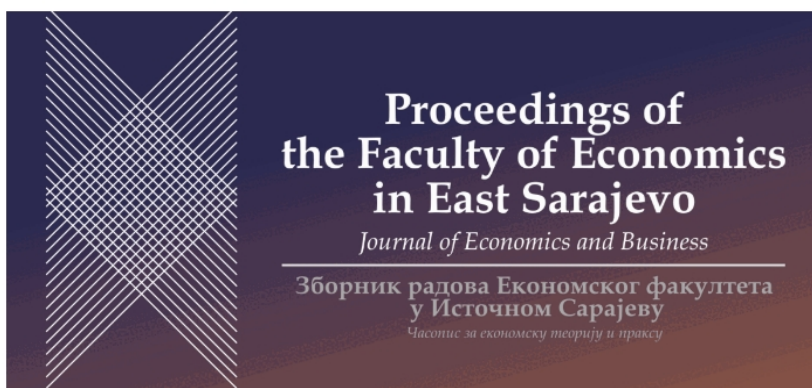
About Journal

Indexing

Awards

Impressum

Contact



Welcome to the Internet site  
**Proceedings of  
the Faculty of Economics  
in East Sarajevo**

*This journal is open access - The  
journal's content is licensed under  
Creative Commons Attribution -  
NonCommercial - NoDerivs 4.0.*



Call for Papers 

Republic of Srpska  
MNRVOID Rank  
First Category  
34 of 40 points

ISSN 1840-3557  
eISSN 1986-6690  
UDC 330.1  
COBISS.RS-ID 16736262  
COBISS.BH-ID 16736262

*Journal is issued semiannually*

The Proceedings of the Faculty of Economics in East Sarajevo - Journal of Economics and Business (Zbornik radova Ekonomskog fakulteta u Istočnom Sarajevu) is a scientific publication of the Faculty. It has been published once a year since 1994 in continuity. The journal was, according to the Ministry of Science and Technology Republic of Srpska, won 34 out of a possible 40 points, and thus classified in the first category of scientific journals. The Proceedings of the Faculty of Economics in East Sarajevo is announced the best scientific and professional journal in Republic of Srpska for 2012.

The concept, goals and strategy of the journal are guided by the Editorial Board of the journal. Editorial Board reserves the right to return to the author the texts that do not comply with the criteria of the guidelines, or to adapt the papers completely in line with the journal rules and prescribed standards of English and one of the BH language. There are no further requirements for the authors concerning other technical elements of text editing. The final decision on publication of papers and their priority order is made by the Editorial Board.

The Journal is open for cooperation with scientists from BiH and abroad all year round. All contributions to economic theory and practice are always welcome. In order to further promote scientific research at the University and to maintain high ratings journal was purchased iThenticate program. The main task of the program is to assist in the detection and prevention of plagiarism.

### Indexing

**ERIH PLUS**  
EUROPEAN REFERENCE INDEX FOR THE  
HUMANITIES AND SOCIAL SCIENCES

**Jisc**

**Sherpa Romeo**

Central and  
Eastern European  
Online Library

**EBSCO**

**INDEX COPERNICUS  
INTERNATIONAL**

**AMERICAN  
ECONOMIC  
ASSOCIATION**

**DOAJ**

**ProQuest**

**Crossref**

**dSrpska**

**CABELLS**

**Google  
scholar**

*This journal is open access - The journal's content is licensed under Creative Commons Attribution - NonCommercial - NoDerivs 4.0.*





*zrefis.ekofis.ues.rs.ba*



*ISSN 1840-3557*



9 771840 355001