

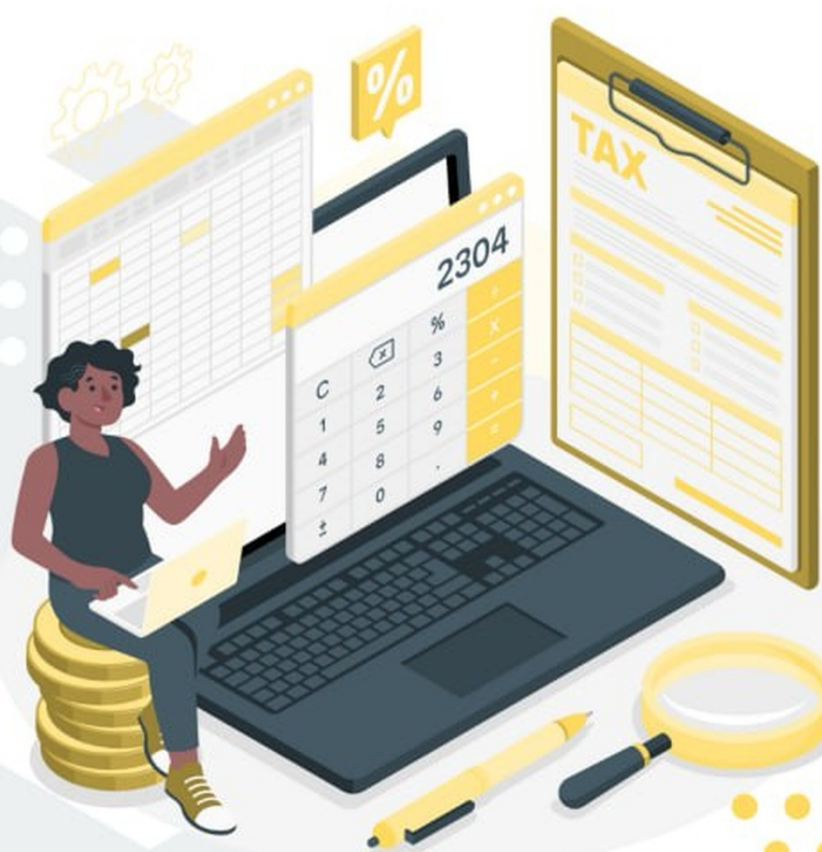


**FUTURITY
PUBLISHING**



**Pylyp Orlyk
International Classical
University**

INTERNATIONAL CONFERENCE ON ECONOMIC SCIENCES AND MANAGEMENT IN THE CHANGING WORLD 2025



Proceedings book

International Conference on Economic Sciences and Management in the Changing World 2025

INTERNATIONAL SCIENTIFIC CONFERENCE

November 7-9, 2025

Organizer

Futurity Research Publishing and Pylyp Orlyk International Classical University

Editor: Andriy Matviyenko,

Pylyp Orlyk International Classical

University, Ukraine

Responsible for the layout: Oleh Harhat



International Conference on Economic Sciences and Management
in the Changing World 2025: collection of scientific papers
Futurity Proceedings, November 7-9, 2025.

Organizer Futurity Research Publishing and Pylyp Orlyk
International Classical University

ISBN 978-83-969744-1-9



The International Conference on Economic Sciences and Management in the Changing World 2025 (ICESMCM 2025) is a global academic event jointly organized by Pylyp Orlyk International Classical University (Ukraine) and Futurity Publishing (Poland). This international partnership brings together academic excellence and professional publishing to promote innovative research and cross-border collaboration.

The conference provides a platform for scholars, researchers, and practitioners to explore current trends, challenges, and innovations in economics and management. It covers a wide range of topics including economic theory, business strategy, finance, entrepreneurship, public policy, and organizational development. Participants are invited to present research and exchange ideas on how economic and managerial practices evolve in response to global transformations.

Conference proceedings are publicly available under the terms of the Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA 4.0) at the www.previous.scientia.report.

All rights of this book belong to Futurity Research Publishing.

Authors are responsible both ethically and juridically.

© Participants of the conference, 2025

© Collection of scientific papers « Futurity Proceedings », 2025

© Futurity Research Publishing, 2025

Editor in Chief

Andriy Matviyenko 

Candidate of Economic Sciences, Pylyp Orlyk International Classical University, Ukraine

Editorial Board

Ladislav Mura 

*University of Economics in Bratislava,
Slovakia*

Volodymyr Saienko 

*Academy of Management and
Administration, Poland*

Jakub Horák 

*Institute of Technology and Business,
Czech Republic*

Kushagra Kulshreshtha 

*Institute of Business Management GLA
University, India*

Liudmyla Verbivska 

*Yuriy Fedkovych Chernivtsi National
University, Ukraine*

Victoria Garkava 

*International Classical University
named after Pylyp Orlyk, Mykolaiv
region, Mykolaiv, Ukraine*

Olha Vdovichena 

*Chernivtsi Institute of Trade and
Economics, Kyiv National University of
Trade and Economics, Ukraine*

Jungho Baek 

University of Alaska, USA

Tatjana Tambovceva 

Riga Technical University, Latvia

Florentin Smarandache 

University of New Mexico, USA

Grzegorz Michalski 

*Wroclaw University of Economic,
Poland*

Marina Järvis 

*Tallinn University of Technology,
Estonia*



Directions for Increasing Production Along the Value-Added Chain in the Petrochemical Industry of Azerbaijan in the Context of Sustainable Development

Shafa Aliyev¹

¹ Doctor of Economic Sciences, professor of Sumgait State University.

Head of the Centre for Karabakh Economic Research, UNEC – Azerbaijan State Economic University, Azerbaijan

✉ **Corresponding author:**
shafa.aliyev@sdu.edu.az



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: In the context of sustainable development in the modern era, the directions of increasing production along the value-added chain in the petrochemical industry of Azerbaijan are being investigated. The role of the petrochemical complex in diversifying Azerbaijan's economy is explained. The effectiveness of developing the petrochemical industry along the value-added chain is substantiated. The importance of creating and developing competitive petrochemical enterprises based on oil and gas processing is stated. The strategic role of petrochemical enterprises in the country's non-oil and gas exports is noted. The possibilities of creating new enterprises along the value-added chain of petrochemical companies are being explored to improve the country's economic structure and increase its export potential. The prospects of creating small and medium-sized plastic processing enterprises based on petrochemical semi-finished products in post-conflict areas are being brought to attention. Proposals are made on the directions of developing petrochemical enterprises in the context of sustainable development.

KEYWORDS: Azerbaijan, sustainable development, petrochemical industry, petrochemical enterprises, added value chain, added production chain, development prospects of petrochemical enterprises, development problems of petrochemical enterprises.

How to cite: Aliyev, S. (2025). Directions for increasing production along the value-added chain in the petrochemical industry of Azerbaijan in the context of sustainable development. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 5-14). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17098691>

Introduction

The industrial sector is one of the essential components of the economy of any country. The industrial sector is not only a guarantor of economic growth, but also plays an indispensable role in creating new jobs, introducing technological innovations and increasing the country's competitiveness in the international market. The development of industrial sectors in Azerbaijan is of particular importance, as it is a key factor in strengthening the country's economic independence and accelerating its future development.

Azerbaijan has become a country with a rapidly developing national economy in the region and the world. However, the level of strategic economic goals in our country, which already has a modern economic development model and rich natural and economic potential, must be significantly increased. In particular, expanding industrial potential and more effective use of existing resources are among the priority issues (Əliyev, Ş.T., 2017). Currently, Azerbaijan's main sources of income are derived from the oil and gas industry; however, price fluctuations in this sector and global energy market changes expose the country to economic risks. The development of the industry aims to stimulate the growth of other areas, generate income for the country from various sectors, and create conditions for economic diversification. The oil and gas industry is also of great importance in terms of stimulating the development of the petrochemical industry because crude oil and natural gas are the main raw materials of that industry.

Research Aim and Research Questions

The primary purpose of writing the article is to investigate and reveal the possibilities of increasing production based on the added value chain in the petrochemical industry of Azerbaijan, taking into account the criteria of sustainable development in the context of global challenges. In recent years, the efficient use of resources, the formation of savings regimes and the increase in processing capabilities based on high technologies have become relevant worldwide. The development opportunities of the petrochemical industry based on oil and gas raw materials are wide, and the identification of prospects for the added value chain and the implementation of measures in this direction require systematic research. The proposals given in the article can be used in the future to determine the development priorities of the petrochemical industry and create a network of competitive, export-oriented enterprises.

Research Results

Direct export of oil as a raw material to world markets prevents oil-producing countries from obtaining additional income, as it does not allow them to use the full potential of a valuable resource. Therefore, it is more expedient to produce high-quality, competitive and new products from oil and introduce them to global markets. Thus, the development of the petrochemical sector is of strategic importance not only for the world's major oil producers, but also for Azerbaijan, which has rich oil reserves. It is critical to develop this sector in accordance with modern requirements and to approach it systematically (Süleymanov, Q.S., Tağıyev, V.Q., Əliyeva, Ş.P., 2024). The petrochemical industry is one of the heavy industries, with its primary purpose being to produce synthetic products and materials derived from oil and natural gas. The products produced in this sector are primarily used as raw materials or reagents in technologically closely related enterprises.

They are also used as raw materials in various fields, such as the pharmaceutical industry, the production of plastic and rubber products, agriculture, construction, and the production of machinery and equipment. The primary production areas of this industry include enterprises that process raw materials and facilities that produce petroleum products using synthetic materials (Əliyev, Ş.T., 2018). The main entities operating in the petrochemical industry are legal entities, their associations and structural divisions, which also carry out the processes of transportation, processing and storage of oil. These entities are participants in ecological and legal relations, since their activities are in interaction with the environment. A characteristic feature of the petrochemical industry, in comparison with other industries, is a high level of automation of labour and the development of technologies, which is associated with the intensification of the use of products of this industry in all sectors of the national economy (Bəxtiyarova, A., 2023).

The creation of a value chain in the petrochemical industry is of utmost economic importance. This process involves converting crude oil and gas into various chemical products, rather than simply exporting them, and processing them in a way that ensures higher income and industrial development. A value chain is the process of adding value to a product at each stage of its production process, from raw materials to the final product. In the petrochemical industry, this is achieved by converting crude oil and natural gas into a range of chemicals and industrial products. Here, the creation of a value chain has a great impact on the country's industrial development, economic diversification, and export potential. Strategic planning, application of technologies, training of human resources, and access to international markets are key factors for successful development in this field.

The value-added chain in the petrochemical industry consists of various stages, which can be divided into the following stages: 1. The stage of raw material extraction based on oil and gas extraction. At this stage, oil and gas deposits are identified through geological surveys, and drilling and production operations are carried out. Crude oil and gas are extracted from the deposits and sent to terminals or processing plants for primary processing. 2. The stage of primary processing is based on the distillation process of oil and gas fractionation. At this stage, crude oil is transported to processing plants via pipelines, tankers or railways, and crude oil is separated into fractions (diesel, gasoline, fuel oil, kerosene, etc.). Methane, ethane, propane, butane and other components are separated from natural gas. 3. The stage of production of basic petrochemical products such as ethylene, propylene, benzene, toluene, etc. The stage of production of basic petrochemical products occupies a strategic place in the value-added chain. At this stage, mainly oil and natural gas are used as raw materials for the production of basic petrochemical products. These raw materials extracted from oil and gas fields initially enter various types of processing plants and are processed. The production of high-value chemicals from crude oil or gas determines the economic efficiency and competitiveness of this sector. The products created at this stage lay the foundation for creating even higher added value in the subsequent stages (production of intermediate and final products). 4. The stage of production of intermediate and final products, which involves the production of plastics, synthetic fibres, rubbers, fertilisers, paints, pharmaceutical components, etc. This stage plays a crucial role in the production of more complex and valuable products utilising various raw materials in the petrochemical industry. This stage itself consists of several main steps,

and at each step the process of cleaning, recycling or changing the substances in its composition is carried out, which includes: - purchase and primary processing of raw materials. At this stage, the raw materials are distilled, that is, decomposed at high temperatures and divided into various fractions. These fractions form the basis of various chemical substances and materials, cracking and reforming processes. Cracking is the process of converting heavy fractions of oil into lighter and more useful substances. For example, it is used to produce gasoline, diesel and other chemical products. Reforming, as a process used to produce high-octane gasoline, changes the structures of carbon-hydrogen compounds through polymerisation. Polymers (plastics, rubbers, etc.) are produced from raw materials, and in this process, in particular, alkenes such as ethylene and propylene are polymerised and converted into various polymers, which is an important stage for the plastics industry; alkylation and isomerisation. In the alkylation process, new chemical compounds are prepared by adding alkyl groups to alkenes. Isomerisation is the process of changing the structure of substances and bringing them into different isomer forms for the production of synthetic materials. The petrochemical industry mainly produces synthetic materials (for example, synthetic fibres, plastics, and synthetic rubber). These materials are then used in various industrial sectors for the preparation of user products. The semi-finished products and polymers produced at this stage are converted into various final product forms. This can be automotive parts, electrical equipment, materials for the textile industry, packaging materials, etc.; Final product quality control and packaging. Final products are subjected to quality control and inspection processes. This is essential to ensure the product is fit for its intended use and is prepared for packaging, shipping, and sales.

Intermediates are products that are usually derived from basic petroleum fractions (gasoline, diesel, etc.) or raw chemicals (ethylene, propylene, etc.). These products are further processed into higher-value and widely used end products. For example, ethylene and propylene polymerise to form plastics and other chemical materials. As a result, this stage is important for the recycling and conversion of products produced in the petrochemical industry into higher-value products. This has a significant economic impact on the processes and drives the development of the industry. When obtaining intermediates, petrochemical enterprises primarily focus on producing olefins, which are functionalized by removing hydrogen, aiming to create more reactive, unsaturated molecules (Aliyev, S., Gulaliyev, M., Purhani, S., Mehdiyeva, G., & Mustafayev, E., 2024). In addition, some of the low-value by-products produced in these facilities have the potential to add value to the overall system in oil refining. For example, methane and hydrogen gases obtained in steam cracking units are considered to have a higher value in oil refining. Methane can be used as a fuel gas, and hydrogen as one of the raw materials for the production of clean fuels (Alxaslı E.A., 2020).

5. The distribution and sales phase, which involves introducing products to domestic and foreign markets (Алиев, Ш.Т., 2015).

The distribution stage is crucial for delivering products produced in the petrochemical industry to end-users. At this stage, the product is directed from the manufacturer to distributors or trade networks, where the added value is based on several factors: transport-logistics - it is important for the efficient and fast implementation of the distribution process, and for the timely delivery of the product to the market, which requires the presence of quality transport and storage

infrastructure; distribution networks - petrochemical products are introduced to the market through distributors for use in various fields. A well-organised distribution network increases the market share of the product and creates added value for the company. Logistics and distribution chain, which involve delivering the product to different markets, adapting to regional market requirements, and exporting to foreign markets, are key components of this stage. These facts are important in creating added value because the correct delivery of the product increases customer satisfaction and strengthens the company's market position. The sales stage encompasses the process of presenting petrochemical products to end consumers or companies, where the added value is based on several key factors. Introducing the product to the market, establishing the correct sales channels, and effectively marketing and advertising the product all play a crucial role in creating added value. Various trading networks and internet platforms are the main components of this stage (Араев, С.Г., Алиев, Ш.Т., 2004); customer relations and services - good customer service and after-sales services create added value. For example, technical support, warranties, and quality assurance regarding the product increase customer satisfaction, which in turn enhances the company's credibility and revenue. Personalised offers and technical support are particularly important for most petrochemical products, as they cater to specific needs. At the sales stage, the adaptation of these products to customers (for example, preparation according to individual requirements or presentation of offers) creates added value; trade relations and marketing - the activities of a strong sales team, advertising and offers tailored to market requirements also create added value at the sales stage. At this stage, effective sales strategies provide a competitive advantage in the market. In general, the distribution and sales stages serve to effectively distribute the product in the chain from production to the market and increase its value. At these stages, added value is created as a result of applying the right strategies, adapting the product to market requirements, and establishing proper customer relationships. In general, at this stage, high-value products are introduced to the world market, and their effective delivery to consumers is ensured.

Products produced at any stage of the value-added chain using more modern technologies have a higher consumer value. They are considered more competitive in the market because they create more added value than other manufacturers. In general, the competitive advantage of a product is measured not by its cheapness, but by its consumer value. In this regard, the concept of competitiveness is of particular importance when examining the value chain. As a result, the analysis of competitiveness allows us to identify the factors that play a key role in the formation of consumer value - that is, in the creation of added value (Məmmədova, N.A., 2022). At each of the stages listed above, the amount of added value increases, but at the final stages, for example, in the production of polymers and high-tech chemical products, this value increases sharply. As can be seen, the added value chain in the petrochemical industry begins with the extraction of raw materials and ends with the preparation of high-tech products. At each stage of this chain, added value is created through technology, efficiency and specialisation (Alguliyev, R.M., Aliyev A.G., Aliyev Sh.T., Shahverdiyeva R.O., 2014).

Strategic planning and investments can make this chain even more valuable and competitive. In addition, centralising corporate governance, optimising costs, and implementing modern digital tools create added value in the petrochemical industry, increasing the competitiveness of these

industrial enterprises. The integration of oil refining and petrochemical industries into one centre also opens up wide opportunities for creating added value. Proper planning of such integrated facilities promises higher operating profitability. The formation of a consistent approach to growth and strategic development, as well as the application of advanced practices in the operation, maintenance, and supply chain, creates the basis for achieving business excellence. As a result, spare parts management is optimised, agile operations are ensured, human resource development is supported, and the quality of technical service, proper allocation of resources, and economies of scale are realised at a higher level (Alxaslı E.A., 2023).

The development of the petrochemical industry along the value chain and the diversification of production are important conditions, and this process requires the establishment of appropriate infrastructure, the attraction and effective use of qualified personnel, as well as the wider distribution of products in this field on the domestic market. To achieve these goals, it is necessary to implement state support measures (Алиев, Ш.Т. В, 2009). Value chain analysis is a crucial step in the petrochemical industry for increasing production. This analysis serves as a strategic tool for examining the economic activities of enterprises. Its main goal is to identify the most valuable operations for enterprises and to identify areas that can be developed to gain a competitive advantage. This analysis reveals the strengths or current weaknesses of the industry. If the competitive struggle is carried out with a differentiation advantage, enterprises will try to operate more efficiently than their competitors. If the enterprise competes with a cost advantage, then it has the opportunity to make a profit by producing cheaper (Айтжанова, Г.О., Патласов, О.Ю., 2022).

The assessment of the methodology for diversifying production in the petrochemical industry should consider not only economic efficiency but also the potential for strengthening the relationships between the system's elements. Such an approach can be useful for assessing the effectiveness of creating or improving value chains at enterprises. During this assessment, the efficiency of managing raw materials, production processes and sales stages should be taken into account. Increasing the efficiency of the added value chain is crucial for enhancing production in the petrochemical industry. When the value chain is functioning optimally, all the critical processes are performed to provide customers with a highly competitive product or service. One of the leading indicators assessing the efficiency of the value chain of a particular product is the possibility of applying a competitive advantage. To analyse the efficiency of the product value chain, attention should be paid to such issues as the individual links of the chain, the relationships between the links and the position of participants (Əhmədzaadə, E.N., 2024). In general, diversification of production along the value chain in the petrochemical industry is necessary, which largely depends on the amount of investment. In this area, it is crucial to establish an optimal capital structure and utilise borrowed funds effectively (Алиев, Ш.Т., 2020). The use of debt funds helps enterprises increase the profitability of their own capital. As a result, multidimensional calculations based on these indicators enable the creation of an optimal capital structure and maximisation of net profitability. The role of investment policy for the effective management of existing fixed assets is significant. This policy involves the process of repeated production with constant investments. Diversification of production in the petrochemical industry should also be based on innovations (Piana V., Aliyev, Sh.T., etc., 2009).

To increase the competitiveness of this industry, which is one of the critical sectors of the Azerbaijani economy, it is necessary to develop it using innovative methods. This approach can also increase the production volume of enterprises, create new jobs, and stimulate the overall development of the country's economy (Керимли, А., 2024). Thus, increasing production along the value chain in the petrochemical industry can be achieved in several directions. These directions involve more efficient use of natural resources and making the product more valuable for the end user, so let's explore their basics—introduction of new technologies and innovation. Introduction of new technologies and innovation increases production efficiency (Алиев Ш.Т., 2008). For example, in terms of increasing production efficiency, highly effective catalysts, less energy-intensive processes, and automated production lines can be utilised. The creation and application of new materials, as well as the development of nanotechnology, can also create higher added value in production processes.

The use of nanomaterials in various fields shapes the future of the petrochemical industry—optimisation of the logistics chain. Proper management of resources at each stage of the logistics chain, optimisation of transportation and improvement of warehouse systems lead to faster and cheaper delivery of products to the market. The establishment of production and processing facilities in some strategic regions increases the speed of production and benefits distributors from proximity to the introduction of digitalisation. Since the petrochemical industry involves highly complex technologies, it is crucial to implement preventive measures to ensure the safe operation of this sector and prevent incidents that could pose a threat to human life. Minimising human intervention plays a key role in the effective and safe management of such production processes.

Additionally, considering these requirements, the introduction and strengthening of digital control mechanisms are of great importance. Digital technologies enable production optimisation in the petrochemical industry (Əlizadə, M., 2024). Data analytics and artificial intelligence can be applied to optimise production. With these technologies, production lines can be managed more efficiently, quality control can be strengthened, and market trends can be analysed more accurately. By connecting and real-time monitoring of all equipment and machines in the production process, resources can be used more effectively (Алиев Ш.Т., 2014).

Expanding the product range and creating special products. In addition to traditional petrochemical products, focusing on the production of special-purpose chemicals, including plastics, polymers, synthetic fibres, etc., can develop the added value chain. This will lead to an increase in product quality and market demand. The ecological balance is maintained, and added value is achieved by recycling chemical waste, utilising recycled materials, and implementing environmentally friendly technologies. Expanding cooperation. The petrochemical industry can develop new products and technologies by cooperating with innovative companies in other fields. By establishing closer cooperation with suppliers and integrating them into production processes, it is possible to obtain raw materials at a lower cost and with higher quality. Cooperation and mutual exchange of experiences, benefiting from the expertise of other companies and experts in the field, will strengthen each stage of the added value chain—human resources development. Training and education of the workforce in accordance with the application of modern technologies is also important for creating added value. Training of specialised personnel will increase the quality of

production. Strengthening branding and market position. Increasing the value of a product is not only about strengthening production, but also about strengthening marketing strategies. Creating a strong brand image and effectively presenting the product's advantages can help it sell at a higher price in the market. Each of these directions will help increase productivity and create new value points at different stages of the value-added chain in the petrochemical industry. Developing strategic approaches in each area will make the sector's future more competitive and sustainable. On the other hand, favourable opportunities will be created for the establishment of small and medium-sized enterprises based on petrochemical intermediates in post-conflict areas (Алиев, Ш.Т., Меликова, Л.А., 2022). Also, new potential will be formed in solving employment problems in these areas (Əliyev, Ş.T., 2020).

Conclusions

In general, the petrochemical industry is one of the main directions of economic development for countries with oil and gas reserves:

- However, the direct export of crude oil and natural gas adds limited value to the local economy. In this regard, the deep processing of oil and gas resources into high-value-added products is of great importance in terms of economic diversification and sustainable development.
- Increasing production along the value-added chain promotes technological development and expands export potential.
- Increasing production along the value-added chain in this industry is of strategic importance in terms of economic diversification, export expansion and ensuring technological independence.
- To this end, technological innovations, investment promotion, personnel training and sustainable development approaches should be implemented together;
- In particular, the promotion of deep processing of crude oil and gas, and the establishment of local production of high-value-added products can create the basis for countries to rise to a higher position in the global petrochemical value chain, etc.

References

- Alguliyev, R. M., Aliyev, A. G., Aliyev, Sh. T., & Shahverdiyeva, R. O. (2014). Development of information support systems for management of innovative structures. In *Proceedings of the 8th IEEE International Conference on Application of Information and Communication Technologies (AICT 2014)* (pp. 378-382). IEEE.
- Alxaslı, E. A. (2023). *Azərbaycanın neftayırma və neft-kimya sənayələrinin integrasiyası üzrə müxtəlif emal variantlarının tədqiqi və optimal istiqamətin seçilməsi* [Автореферат дисертації на здобуття ступеня PhD]. Bakı.
- Alxaslı, E. A. (2020). Neft emalı və neft-kimya zavodlarının integrasiyası: dövrün tələbi, tətbiq olunan müasir həllər. *Azərbaycan neft təsərrüfatı*, 2020(1), 44-50.
- Aliyev, S., Gulaliyev, M., Purhani, S., Mehdiyeva, G., & Mustafayev, E. (2024). Comparative

- assessment of energy security level: The case of the South Caucasus countries. *International Journal of Energy Economics and Policy*, 14(1), 651–662. <https://doi.org/10.32479/ijeep.14984>
- Bəxtiyarova, A. (2023). Neft-qaz xammalından məhsuldar istifadənin təşkilində neft-kimya emal müəssisələrinin strateji rolu. *Geostrategiya*, (06 [78]), 93–97.
- Əhmədzadə, E. N. (2024). Məhsulun dəyər və tədarük zəncirlərinin səmərəliliyinin xarakteristikası [PDF]. <https://timjurnal.az/uploads/2024/08/emin-ehmedzade-imeyl.pdf>
- Əliyev, Ş. T. (2017). Sumqayıt şəhərinin sənaye potensialının genişləndirilməsi məsələləri. *İpək Yolu*, 1, 28–33.
- Əliyev, Ş. (2020). Qarabağ və Şərqi Zəngəzur iqtisadi rayonlarının yaradılmasının strateji aspektləri. *Geostrategiya*, (05/06 [59/60]), 67–72.
- Əliyev, Ş. T. (2018). *Azərbaycan iqtisadiyyatı*. SDU-nun Redaksiya və nəşr işləri şöbəsi.
- Əlizadə, M. (2024). Rəqəmsal transformasiyalar kontekstində kimya və neft-kimya kompleksinin istehsal-ixrac potensialının gücləndirilməsi istiqamətləri. *Geostrategiya*, (06 [84]), 213–217.
- Məmmədova, N. A. (2022). *Dəyər zəncirinin genişləndirilməsi kontekstində Azərbaycan neft-kimya sənayesinin dünya bazarına integrasiyasının rəşional istiqamətləri* [Дисертація PhD]. Bakı.
- Piana, V., & Aliyev, Sh. T. (2009). *Innovative economic policies for climate change mitigation*. Economics Web Institute.
- Süleymanov, Q. S., Tağıyev, V. Q., & Əliyeva, Ş. P. (2024). Azərbaycanın neft emalı sənayesində sahibkarlığın inkişaf perspektivləri və iqtisadi inkişafda rolu. *Audit*, 1(43), 88–97.
- Агаев, С. Г., & Алиев, Ш. Т. (2004). *Проблемы и перспективы торгово-экономических связей Азербайджана с Россией*. Элм.
- Айтжанова, Г. О., & Патласов, О. Ю. (n.d.). Формирование цепочки добавленной стоимости нефтегазовой продукции. *Раздел 3. Экономические науки*, 169–177. <https://journal.omga.su/wp-content/files/37/22.pdf>
- Алиев, Ш. Т. (2014). Моделирование инноватизации национальной экономики в современных условиях. *Научное обозрение*, (06), 342–346. http://www.sced.ru/ru/index.php?option=com_content&view=article&id=300:nauchnoe-obozenie-6-2014&catid=29:2010-02-08-07-22-37&Itemid=136&limitstart=9
- Алиев, Ш. Т. (2008). *Проблемы организации и перспективы развития особых экономических зон*. Наука.
- Алиев, Ш. Т. (2020). Актуальные вопросы экономической безопасности Азербайджана в условиях пандемии и постпандемии. *Известия НАНА. Институт экономики*, (5), 5–12. http://economics.com.az/images/fotos/xeberler_pdf/2020_5/1.Shafa.pdf
- Алиев, Ш. Т. (2009). Важность применения новых экономических инструментов в экономике Азербайджана. *Национальные интересы: приоритеты и безопасность*, 80–84.
- Алиев, Ш. Т. (2015). *Внешнеэкономическая политика Азербайджана*. Издательство

Сумгаитского государственного университета.

- Алиев, Ш. Т., & Меликова, Л. А. (2022). Актуальные проблемы и объективные реалии мирового опыта в восстановлении освобожденных от оккупации территорий. In *IX Международная научно-практическая конференция «Развитие науки и практики в глобально меняющемся мире в условиях рисков»* (pp. 277-286). Москва. <http://adm.nauka20-35.ru/Files/ArticleFiles/8f3daa80-dcee-4e22-98f2-3ccd41631497.pdf>
- Керимли, А. (2024). Актуальные проблемы развития нефтехимических предприятий Азербайджана в цепочке добавленной стоимости. *Scientific Collection «InterConf»*, (186), 12-19.



China's Belt and Road Initiative: Opportunities and Challenges for International Business

Munazza Jamshed Khan¹, Abdullah Ali Jameel Alabd Rahman², Jawad UL Hassan^{1*}

¹ School of Economics and Management, North China University of Water Resources and Electric Power, China

² School of Economics, Management and Business Administration, China University of Geosciences, Wuhan, China

¹ College of international studies, Area studies, Shenzhen University, China.

✉ **Corresponding author:** Jawad UL Hassan



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: The Belt and Road Initiative (BRI), launched by China in 2013, has emerged as a transformative framework for global connectivity, trade, and investment. Designed to revitalise historical trade routes and foster international cooperation, the BRI provides vast opportunities for businesses through expanded market access, large-scale infrastructure development, financial collaboration, and technological innovation. At the same time, it presents significant challenges, including geopolitical tensions, debt sustainability issues, regulatory complexities, and environmental concerns. This article examines both the opportunities and challenges of the BRI for international business, emphasising the need for strategic foresight, risk management, and sustainable practices. By adopting adaptive approaches, businesses can leverage the benefits of the BRI while mitigating its risks, thereby contributing to more balanced global economic integration.

KEYWORDS: Belt and Road Initiative, international business, trade, infrastructure, globalisation, opportunities, challenges, China

How to cite: Khan, M. J., Rahman, A. A. J. A. & Hassan, J. U. (2025). China's Belt and Road Initiative: Opportunities and challenges for international business. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 15-20). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17098840>

Introduction

The introduction of this article begins by presenting the Belt and Road Initiative (BRI) as one of the most remarkable and large-scale development projects of the modern era (Sarker, Hossin et al. 2018). It explains that the BRI was launched in 2013 under the leadership of Chinese President Xi Jinping, and from the outset, it was envisioned not as a single project, but as a comprehensive framework designed to enhance global connectivity. The initiative involves the development of new trade routes, the construction of massive infrastructure projects, and the creation of economic corridors that connect Asia, Europe, Africa, and even parts of Latin America (Chan 2018). By framing the BRI as a revival of the ancient Silk Road on a modern scale, the introduction highlights its historical significance while also underscoring its global ambitions. This contextual background helps the reader understand that the BRI is not limited to China alone. Still, it is an international undertaking that directly involves more than 140 countries and indirectly impacts the global economy as a whole.

Once the initiative is introduced, the focus shifts to explaining its importance for international business. The introduction highlights that the BRI has profound implications for global commerce, particularly in terms of reshaping trade patterns, investment opportunities, and cross-border economic relationships (Khan, Congmei et al. 2024). By establishing new highways, ports, energy pipelines, and railway systems, the BRI reduces transportation costs and makes international trade more efficient. This benefits not only large multinational corporations but also smaller enterprises that gain access to new markets (Fujita 1995). The initiative also fosters financial and technological cooperation, enabling businesses from diverse regions to explore opportunities in sectors such as construction, logistics, banking, telecommunications, and e-commerce. In this way, the introduction makes it clear that the BRI is not merely a political or diplomatic project, but a development deeply intertwined with the growth and operations of international businesses (Li, Van Assche et al. 2022). At the same time, the introduction avoids presenting the BRI in an overly optimistic manner. Instead, it establishes a balanced tone by acknowledging that, along with these opportunities, come significant challenges. It briefly mentions some of the risks associated with the initiative, such as financial concerns and geopolitical tensions. Financial risks often arise from the heavy borrowing required by many developing countries to fund BRI projects, which can lead to debt dependency and economic instability. Geopolitical challenges, on the other hand, stem from the suspicion and resistance expressed by other global powers and regional actors who view the BRI as a tool for China to extend its political influence (Ul Mansoor 2023). By including both positive and negative perspectives, the introduction signals to the reader that the article will not be one-sided. Instead, it promises to deliver a critical analysis that carefully weighs the benefits against the potential drawbacks. Finally, the introduction ends with a clear statement of purpose. It informs the reader that the article aims to explore the dual nature of the BRI for international businesses. On the one hand, it will highlight how the initiative creates new trade opportunities, strengthens global connectivity, and promotes cooperation across borders (Chang, Iakovou et al. 2020). On the other hand, it will also examine the complexities and difficulties that businesses may encounter, such as navigating unstable financial conditions, managing regulatory differences across countries, and dealing with the political sensitivities surrounding the initiative. This concluding statement of the introduction serves as a roadmap for the rest of the paper, letting the reader know that the upcoming sections will

systematically analyse both sides of the BRI's impact (Garlick 2019).

In essence, the introduction successfully frames the Belt and Road Initiative as a global project of immense scale and consequence (Huang 2016). It sets the background by explaining what the initiative is, highlighting its importance for international business, acknowledging both opportunities and risks, and clearly outlining the purpose of the article. By doing so, it prepares the reader to engage with a discussion that is not only descriptive but also critical, providing a balanced understanding of how the BRI is shaping the landscape of international trade and business in the 21st century (Zongze 2019).

Opportunities for International Business

1. Expansion of Trade Routes and Market Access

One of the primary benefits of the BRI is the expansion of global trade routes. By revitalising the ancient Silk Road through land and maritime corridors, businesses gain easier access to emerging markets in Asia, Africa, and Eastern Europe. Improved transportation networks reduce logistical costs, shorten delivery times, and expand market opportunities for multinational corporations and small enterprises alike.

2. Infrastructure Development and Investment Opportunities

The BRI is heavily focused on large-scale infrastructure projects, such as roads, railways, ports, and energy pipelines. These projects generate business opportunities not only for Chinese firms but also for international construction companies, engineering consultancies, and logistics enterprises. Additionally, improved infrastructure enhances the efficiency of supply chains, making international trade more competitive and profitable.

3. Financial and Technological Cooperation

The initiative promotes financial cooperation through institutions such as the Asian Infrastructure Investment Bank (AIIB) and the Silk Road Fund, which provide financing for cross-border projects. This creates avenues for international businesses to access capital for expansion into new markets. Furthermore, the digital dimension of the BRI, often referred to as the "Digital Silk Road," encourages collaboration in e-commerce, telecommunications, and technological innovation, thereby accelerating digital globalisation.

4. Strengthening of Regional Integration

By encouraging closer economic ties among participating countries, the BRI promotes regional integration and harmonisation of trade policies. This opens opportunities for international firms to establish partnerships, joint ventures, and networks within diverse markets, increasing their global competitiveness.

Challenges for International Business

1. Geopolitical Risks

While the BRI creates opportunities for economic cooperation, it also triggers geopolitical concerns. Countries such as the United States, India, and members of the European Union have

expressed scepticism about China's strategic intentions, fearing potential debt dependency and political influence. These geopolitical tensions may complicate the operations of businesses that seek to engage in BRI-related projects.

2. Debt Sustainability and Financial Risks

Many BRI projects are financed through loans from Chinese banks, raising concerns about debt sustainability in participating countries. Cases of debt distress in Sri Lanka, Pakistan, and some African states highlight the risks of financial instability. For international businesses, such instability creates uncertainty about long-term investments and the viability of projects.

3. Legal and Regulatory Complexities

The BRI spans multiple jurisdictions, each with its own legal frameworks, trade policies, and regulatory standards. International firms face challenges in navigating complex legal systems, ensuring compliance with local regulations, and managing risks of corruption or weak governance in some partner countries.

4. Environmental and Social Concerns

Large-scale infrastructure projects often present significant environmental and social challenges, including deforestation, displacement of local communities, and ecological degradation. International businesses participating in BRI projects may encounter reputational risks if they are associated with unsustainable practices, prompting the need for stronger corporate social responsibility (CSR) measures.

5. Cultural and Linguistic Barriers

Operating across diverse cultural and linguistic landscapes poses challenges in negotiation, project management, and cross-border collaboration. Miscommunication and lack of cultural sensitivity may lead to conflicts or inefficiencies, requiring international businesses to invest in intercultural competence.

Methodology

This study adopts a qualitative and exploratory research design to analyse the opportunities and challenges posed by China's Belt and Road Initiative (BRI) for international business. The methodology is primarily based on secondary data collection, comparative analysis, and thematic evaluation.

1. Research Design

The research employs a descriptive and analytical approach. Instead of collecting primary data through field surveys or experiments, the study relies on critical examination of existing literature, policy documents, and case studies to provide insights into the implications of the BRI.

2. Data Collection

Data was gathered from diverse secondary sources, including:

- Academic literature published in peer-reviewed journals focusing on international business, economics, and political science.

- Official reports and white papers from Chinese government institutions, the Asian Infrastructure Investment Bank (AIIB), the World Bank, and the International Monetary Fund (IMF).
- Policy briefs and working papers from think tanks specialising in global trade and development.
- News articles and industry reports provide updates on ongoing BRI projects and their economic impact.

3. Analytical Framework

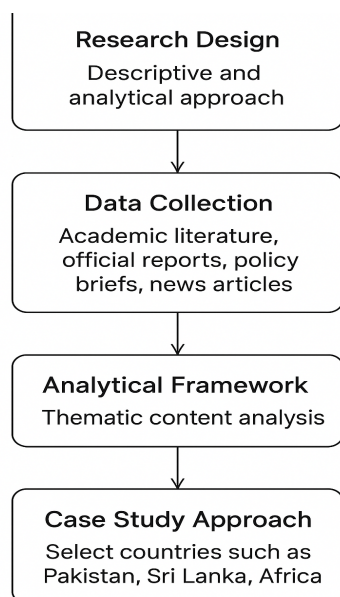
The collected data were examined using a thematic content analysis approach. Key themes were identified and categorised under two broad dimensions:

- Opportunities (e.g., infrastructure development, trade expansion, financial cooperation, regional integration).
- Challenges (e.g., geopolitical tensions, debt sustainability, regulatory barriers, environmental and social risks).

This framework enabled a systematic comparison of the positive and negative impacts of the BRI on international business across different regions.

Figure 1

Methodology



Discussion

The Belt and Road Initiative represents a paradigm shift in global economic integration. For international businesses, it presents a mix of opportunities and risks. Companies that strategically engage with the BRI can benefit from expanded markets, improved infrastructure, and financial support, positioning themselves at the forefront of global trade. However, success requires a careful balancing of opportunities with potential risks, including political instability, financial liabilities, and environmental responsibilities.

To maximise benefits, businesses must adopt proactive strategies such as:

- Conducting comprehensive risk assessments before investment.
- Building partnerships with local stakeholders to ensure sustainable development.
- Strengthening compliance with international legal, ethical, and environmental standards.
- Leveraging technology and innovation to enhance efficiency and competitiveness.

Conclusion

China's Belt and Road Initiative is a transformative force in the global economic landscape. By promoting connectivity, trade, and investment, it offers unprecedented opportunities for international businesses to expand their operations and strengthen cross-border partnerships. At the same time, it poses complex challenges that demand cautious navigation and strategic foresight. The ultimate impact of the BRI on international business will depend on how effectively stakeholders balance economic ambitions with geopolitical realities, financial sustainability, and social responsibility. In this context, the BRI can be viewed as both a catalyst for global economic growth and a test of international cooperation in an era of shifting power dynamics. For international businesses, success lies in adopting adaptive, responsible, and forward-looking strategies that align with the evolving contours of the Belt and Road Initiative.

References

- Chan, M. H. T. (2018). The belt and road initiative - The new silk road: A research agenda. *[Journal of Chinese Economic and Asian Studies]*, 7(2), 104-123.
- Chang, Y., et al. (2020). Blockchain in global supply chains and cross-border trade: A critical synthesis of the state-of-the-art, challenges and opportunities. *[Journal name not provided]*, 58(7), 2082-2099.
- Fujita, M. (1995). Small and medium-sized transnational corporations: Salient features. *Small Business Economics*, 7(4), 251-271.
- Garlick, J. (2019). *The impact of China's Belt and Road initiative: From Asia to Europe*. Routledge.
- Huang, Y. (2016). Understanding China's Belt & Road initiative: Motivation, framework and assessment. *China Economic Review*, 40, 314-321.
- Khan, A., et al. (2024). Assessing Xi Jinping's vision of modernization and its implications for global trade dynamics: A case study of the Belt and Road Initiative. *[Journal name not provided]*, 12(1), 106-126.
- Li, J., et al. (2022). Foreign direct investment along the Belt and Road: A political economy perspective. *World Economy*, 53(5), 902-919.
- Sarker, M. N. I., et al. (2018). One Belt One Road initiative of China: Implication for future of global development. *Future Business Journal*, 9(4), 623-638.
- Ul Mansoor, S. I. (2023). China's geopolitical strategy: Crafting a new world order. *Chinese Quarterly of International Strategic Studies*, 9(1-4), 337-359.
- Zongze, R. (2019). The Belt and Road Initiative is shaping a shared 21st century. *China International Studies*, 76, 5-15.

BRICS and the Transformation of Global Financial Governance: Challenging the Bretton Woods Institutions

Opeoluwa Adisa, Oluyemi¹

¹ PhD, Senior Lecturer, Department of Political Science and International Relations, Achievers University, Owo, Ondo State, Nigeria

✉ Corresponding author:
opeoluyemio@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study critically examines the emergence of BRICS-led financial institutions, notably the New Development Bank (NDB) and the Contingent Reserve Arrangement (CRA), as a challenge to the Bretton Woods institutions, which Western economic powers have long dominated. Anchored in a Critical International Political Economy (IPE) framework, the research explores how BRICS seeks to reshape global financial governance by promoting a more multipolar and equitable world order. This paper employs a qualitative research methodology, primarily relying on secondary data sources, including policy documents, academic literature, official declarations, and institutional reports. The study reveals that while BRICS institutions are still developing in terms of scale and operational capacity, they symbolise a paradigm shift in international financial architecture, emphasising sovereignty, inclusivity, and alternative development models. The findings suggest that the BRICS' approach constitutes both a critique of and a complement to the Bretton Woods institutions, with long-term implications for the global economic power balance.

KEYWORDS: BRICS, New Development Bank (NDB), Contingent Reserve Arrangement (CRA), Bretton Woods Institutions, Critical International Political Economy (IPE), Global Financial Governance.

How to cite: Oluyemi, O. A. (2025). BRICS and the transformation of global financial governance: Challenging the Bretton Woods institutions. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 21-35). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17160293>

Introduction

In July 1944, representatives from 44 nations convened in Bretton Woods, New Hampshire, with a shared vision of reconstructing a war-torn global economy. This historic gathering took place during the final stages of the Second World War, at a time when large parts of Europe, Asia, and Africa were devastated and in urgent need of economic recovery. The central focus of the conference was to design a framework that would reintegrate these regions into the global economy and promote robust and sustained economic growth through deeper international cooperation and trade liberalisation (Helleiner, 2014). Out of this landmark event emerged two pivotal institutions: the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD), which later became part of the World Bank Group. The IMF, officially established on 27 December 1945, was created to monitor global monetary cooperation and ensure financial stability, while the IBRD was tasked with facilitating the reconstruction of war-affected regions and fostering development through financial assistance (Eichengreen, 2019). To complement these efforts, a comprehensive framework for global trade was developed through the General Agreement on Tariffs and Trade (GATT) in 1947, which laid down the rules for international commerce for nearly half a century before evolving into the World Trade Organisation (WTO) in 1995 (WTO, 2024). These institutions and agreements collectively laid the groundwork for a system of currency convertibility, open trade, and multilateral economic governance. The Bretton Woods system significantly shaped the post-war global economy by advancing economic openness and promoting integration among national economies. The outcomes were evident: between 1950 and 2000, the global economy expanded at a pace substantially faster than in the first half of the 20th century, affirming the success of the vision set forth at Bretton Woods (Kenen, 2020). This era highlighted the significant role that international institutions and cooperation can play in promoting shared prosperity and peace.

Following the end of World War II, global economic recovery initiatives such as those established at the Bretton Woods Conference in 1944 were primarily designed to benefit Western Europe and a few other industrialised nations. Many other regions, especially in Africa, Asia, and parts of Latin America, did not experience comparable economic revitalisation. This disparity was primarily due to the fact that much of the non-Western world remained under colonial domination well into the mid-20th century. European colonial expansion, which began in the 16th century, had by the 19th century absorbed vast territories across the Global South. These colonial regimes not only extracted economic resources but also imposed Eurocentric values and institutions on local cultures (Mazower, 2020). Although the formal colonial empires began to unravel in the wake of World War I, driven by widespread independence movements, many newly sovereign nations found themselves excluded from the immediate benefits of the international economic order established during that era. Institutions such as the International Monetary Fund (IMF) and the World Bank were structured to support the recovery and integration of Western economies. As a result, the post-war economic boom largely bypassed former colonies, reinforcing a system in which the United States and its allies disproportionately shaped global economic policy. This arrangement became known as the Bretton Woods system, characterised by Western dominance in decision-making and a narrow prioritisation of Western economic interests (Helleiner, 2014).

It was in response to this perceived imbalance in global governance that the BRIC grouping comprising Brazil, Russia, India, and China was initially formed. Emerging as a forum of leading developing economies, BRIC held its first summit in 2009. The inclusion of South Africa in 2010 led to the formation of BRICS. Over time, this bloc evolved as a counterweight to Western-led institutions such as the IMF, the World Bank, the G7, and even

the United Nations Security Council (O'Neill, 2023). In 2024, the group expanded further, adding Egypt, Ethiopia, Iran, and the United Arab Emirates. Though Argentina declined its invitation and Saudi Arabia had not confirmed formal membership as of mid-2025, the newly expanded configuration is often referred to as "BRICS" (Zhao, 2024). At the 2024 Kazan Summit, hosted by Russia, BRICS reportedly explored further membership categories, inviting countries such as Algeria, Kazakhstan, Nigeria, and Vietnam; however, the precise mechanisms of integration remain unclear. From its inception, BRICS sought to coordinate economic and diplomatic strategies among emerging powers and to promote alternatives to the Western-dominated financial order. Central goals have included advancing multilateralism, reforming global governance institutions, rejecting non-UN sanctions, and reducing reliance on the U.S. dollar in international trade (Naím, 2024). Yet, despite these shared objectives, the group faces internal contradictions. BRICS members have varied political systems, economic structures, and foreign policy priorities. Their differing responses to international conflicts such as the Russia-Ukraine war and the Israel-Hamas conflict reflect these complexities. Nonetheless, a common commitment to accelerating economic development and asserting greater agency in global affairs continues to unite the bloc.

A significant achievement of BRICS has been the establishment of the New Development Bank (NDB) in 2014. Designed to offer an alternative source of development financing, the NDB offers loans for infrastructure and sustainable development projects in member states, including clean energy, transportation, and sanitation. Since beginning operations in 2016, it has approved over USD 32 billion in funding across 96 projects. While significant, this figure pales in comparison to the World Bank, which disbursed nearly USD 72.8 billion in fiscal year 2023 alone (World Bank, 2024). Complementing the NDB, the Contingent Reserve Arrangement (CRA) was launched to provide liquidity support during short-term balance of payment crises, serving as a financial safety net for BRICS members. Both the NDB and CRA reflect BRICS' broader ambition to reshape global financial architecture, especially by offering alternatives to what UN Secretary-General António Guterres has described as a system "created by rich countries to serve rich countries" (United Nations, 2023). While the future of BRICS remains uncertain, its growing membership and assertiveness suggest that it may increasingly challenge the influence of Western-dominated institutions. Some analysts argue that BRICS+ could significantly shift the geopolitical balance, especially if plans to introduce a shared currency or new payment systems are implemented. Others remain sceptical, noting that the group's internal diversity and geopolitical contradictions could hinder its ability to form a cohesive alternative to the Bretton Woods order. Nevertheless, this research argues that the expanding role of BRICS, posing a notable challenge to the Bretton Woods institutions, represents a broader push by emerging economies to secure a more equitable and multipolar global order.

Theoretical Framework: Critical International Political Economy (IPE)

The global financial architecture, historically rooted in Western liberalism and dominance, is increasingly being challenged by a coalition of emerging economies, collectively known as the BRICS: Brazil, Russia, India, China, and South Africa. More than just a group of high-growth markets, BRICS has become a political bloc advocating for a more equitable international order. Their efforts to reform global economic governance have manifested institutionally in initiatives such as the New Development Bank (NDB) and the Contingent Reserve Arrangement (CRA), both of which aim to serve as counterweights to the established Bretton Woods institutions, namely the International Monetary Fund (IMF) and the World Bank. To adequately interrogate this transformation in global governance, this research adopts a Critical International Political Economy (Critical IPE) framework. Unlike orthodox approaches that often treat markets and institutions as neutral arbiters of economic efficiency,

Critical IPE foregrounds the role of ideology, class structures, and historical power dynamics. It provides a lens through which the contestation between BRICS and the Bretton Woods system can be interpreted not only as institutional competition but also as ideological resistance to neoliberal hegemony. Critical IPE emerged as a response to mainstream economic theories that marginalized the role of power, inequality, and historical context in shaping economic outcomes. Drawing from Gramscian and neo-Marxist traditions, Critical IPE emphasises three core dimensions: firstly, ideological hegemony, which argues that global institutions like the IMF and World Bank are not ideologically neutral. They promote neoliberalism, prioritising market liberalisation, deregulation, and fiscal austerity as a universal policy prescription, thereby institutionalising Western capitalist values in the global South's economic governance (Živković, 2024). Secondly, core-periphery reproduction, which argues that financial and development aid mechanisms often reinforce asymmetrical relations between developed and developing countries. Conditionalities imposed by the IMF and World Bank frequently require recipient nations to implement structural adjustment programs that erode sovereignty and embed dependency on Western financial markets. Lastly, agency in resistance whereby critical IPE recognises the capacity of non-Western actors to resist and reshape global norms. Institutions like the NDB represent more than just financial alternatives; they are both symbolic and practical manifestations of the global South's agency, pushing back against neoliberal universality (Luo & Yang, 2021). Through this lens, BRICS emerges not merely as a coalition of economic powers but as an ideological project seeking to reconstruct the rules of global capitalism.

The Bretton Woods Institutions as Agents of Neoliberal Hegemony

The International Monetary Fund (IMF) and World Bank, both established in the aftermath of World War II, were initially conceived to foster economic stability and facilitate reconstruction across war-torn regions. Over time, however, these institutions have evolved in both their functions and ideological alignments. From the late twentieth century onward, particularly during the debt crises of the 1980s and 1990s, the IMF and World Bank adopted a distinct neoliberal orientation. Their deployment of structural adjustment programs (SAPs) during this period revealed the extent to which these global financial entities operated not only as technical mechanisms, but also as vehicles for a particular economic orthodoxy that privileged market liberalisation over social equity. One of the primary criticisms of the Bretton Woods institutions, from the lens of Critical International Political Economy (IPE), centres on the erosion of national sovereignty through the enforcement of SAPs. These programs typically mandated borrowing countries to implement a mix of austerity measures, deregulation, and privatisation. While intended to restore macroeconomic balance and facilitate debt repayment, these conditionalities frequently resulted in substantial harm to domestic economies, particularly among the working class. Reduced public spending often translates into diminished access to healthcare, education, and welfare services, contributing to increased poverty and long-term economic stagnation (Živković, 2024). Consequently, SAPs have been criticised not only for their economic ineffectiveness but also for exacerbating social inequality and undermining democratic policy-making.

A second major critique lies in the unequal governance structure within the IMF and World Bank, which continues to favour developed economies. Decision-making power in both institutions is allocated based on financial contributions, granting disproportionate influence to wealthier countries. For instance, the United States maintains veto power in the IMF by holding over 16% of voting rights, a threshold that no major policy decision can surpass without American consent (Luo & Yang, 2021). This imbalance has hindered efforts to democratise these institutions and continues to marginalise the voices and interests of developing nations. As a result, reform

efforts have stalled, mainly, reinforcing a governance model that perpetuates the status quo. The third criticism concerns the ideological entrenchment of neoliberalism within the operations of these institutions. Economic liberalisation is often equated with modernisation and progress, sidelining alternative models of development that may better suit local contexts. The IMF and World Bank tend to promote a one-size-fits-all approach that privileges global market integration and downplays indigenous governance structures and economic strategies (Wu, 2016). This ideological rigidity not only limits policy flexibility for borrowing nations but also suppresses the development of diverse economic paradigms tailored to regional needs. In response to these critiques, the emergence of the BRICS coalition signifies a deliberate effort to reimagine global financial governance.

The creation of the New Development Bank (NDB) and the Contingent Reserve Arrangement (CRA) reflects the group's commitment to providing alternative financial institutions that are grounded in the principles of equity and inclusivity. Unlike the IMF and World Bank, the NDB operates on a one-country-one-vote model, rejecting the weighted voting systems that have historically favoured Western powers (Luo & Yang, 2021). This institutional structure not only symbolises a move toward egalitarian governance but also enhances the legitimacy of the BRICS institutions among Global South stakeholders. A notable distinction in BRICS financing mechanisms is the absence of conditionalities commonly associated with Bretton Woods lending. The NDB and CRA offer sovereign-friendly loans that preserve the policy autonomy of recipient countries. This model enables borrowing nations to prioritise domestic development goals without external interference, addressing a long-standing grievance among Global South countries that have been subjected to the intrusive demands of traditional financial institutions (Živković, 2024). Such an approach enables recipient states to maintain control over their economic trajectories while accessing necessary development capital.

Another hallmark of BRICS initiatives is their emphasis on South-South cooperation. Projects funded by the NDB tend to prioritise infrastructure, energy, and regional connectivity, sectors often overlooked by Bretton Woods' institutions, which have traditionally focused on macroeconomic stabilisation and trade liberalisation (Monyae & Matambo, 2021). This shift in focus reflects an understanding of the developmental needs of emerging economies and a commitment to fostering economic integration within the Global South. Ideologically, BRICS represents a pluralistic and multipolar alternative to the prevailing neoliberal order. The group actively promotes diverse development models, cultural autonomy, and inclusive governance structures. These values are embedded in the institutional design and strategic objectives of the BRICS framework, positioning it as a counter-hegemonic force in global affairs (Mugarura, 2023). While some analysts argue that BRICS institutions may eventually complement rather than supplant Bretton Woods bodies, their existence fundamentally challenges the notion that Western-led financial institutions are the only viable model for global development (Pandit, 2019). Summarily, the challenge posed by BRICS to the Bretton Woods institutions is far more profound than a rivalry over financial flows or institutional influence. It represents a contest over the very ideology that underpins global economic governance. Through the creation of parallel institutions rooted in equality, sovereignty, and cultural pluralism, BRICS is reshaping the discourse on development finance. Although the future of these institutions remains uncertain, their emergence marks a pivotal step toward a more inclusive and multipolar world order.

The Evolving Role of BRICS in a Shifting Global Order

As of January 1, 2024, the BRICS coalition, originally comprising Brazil, Russia, India, China, and later joined by South Africa in 2010, has expanded to include five additional countries: Egypt, Iran, the United Arab Emirates

(UAE), Ethiopia, and Saudi Arabia. While Saudi Arabia currently participates as an observer rather than a full member, this expansion highlights the growing geopolitical significance of the group and its increasing appeal to emerging economies seeking alternatives to Western-led institutions (Zhao, 2024). BRICS has steadily positioned itself as a counterbalance to entities such as the International Monetary Fund (IMF) and the World Bank, which are widely perceived to reflect Western priorities. The coalition now encompasses approximately 45% of the global population (roughly 3.5 billion people), covers a third of the world's landmass, and accounts for 44% of global oil production. With a collective gross domestic product (GDP) nearing USD 29 trillion, BRICS has overtaken the G7 in terms of purchasing power parity, indicating a dramatic shift in global economic influence (Naím, 2024). Russian President Vladimir Putin has emphasised the rapid economic momentum within the BRICS bloc, noting that its share of IMF quotas has surged from 8.4% in 2001 to 25.8% in 2022. During the same period, the G7's quota dropped significantly, from 64.6% to 42.9%, further illustrating the global rebalancing of power (IMF, 2023). BRICS has found a natural partner in the Shanghai Cooperation Organisation (SCO), with both groupings sharing a common agenda to challenge what they see as a neo-colonial economic order dominated by the United States and its allies. While SCO has geopolitical weight, BRICS adds financial and developmental muscle. Together, they aim to create a more balanced global system, particularly through the process of de-dollarisation, which involves gradually reducing dependency on the U.S. dollar in trade and finance. Efforts toward this de-dollarisation strategy are becoming increasingly evident. Russia, for instance, now conducts around 75% of its foreign trade in currencies other than the U.S. dollar. Countries in Southeast Asia, including Malaysia, Thailand, and Vietnam, are similarly exploring non-dollar trade arrangements. Notably, 60% of trade between Russia and Vietnam is now conducted in alternative currencies. Thailand, in particular, is expected to gain BRICS membership at the upcoming 2024 Kazan Summit in Russia (Repnikova & Chen, 2023).

The BRICS bloc has received expressions of interest from over 30 nations, including Mexico, Nigeria, and Bangladesh, which see in the coalition a path to greater economic autonomy. BRICS has broadened its focus beyond economic cooperation to include initiatives in science, health, technology, education, and cultural diplomacy. Through deeper engagement in these areas, the group hopes to strengthen South-South collaboration and foster collective development across the Global South (Zhao, 2024). Moreover, there is growing sentiment within the bloc that the path to true economic sovereignty for developing nations lies in dismantling the legacy structures of economic colonialism. One concrete step has been the gradual replacement of the U.S. dollar in oil transactions with local or regional currencies, signalling a pushback against the longstanding dominance of Western financial mechanisms. The expulsion of French influence from resource-rich West African nations, such as Niger, which once supplied uranium to France at undervalued rates, also underscores a broader decolonisation effort (United Nations, 2023). Despite its expanding influence and ambitious goals, BRICS still lacks the institutional cohesion seen in more formal international organisations. The issue of internal governance and structural formalisation is expected to be a central theme at the Kazan Summit. Under the Russian presidency, the summit is reportedly expected to prioritise efforts to enhance institutional development within BRICS, potentially transforming it into a more unified and strategically organised actor on the global stage (O'Neill, 2023).

The Institutional Genesis of the BRICS Bank: NDB and CRA

The institutional architecture of the BRICS Bank was established through a dual initiative: the formation of

the New Development Bank (NDB) and the Contingent Reserve Arrangement (CRA). Together, these mechanisms reflect a shared aspiration among BRICS countries to reshape global financial governance and reduce dependence on the Bretton Woods institutions. The CRA functions as a pooled reserve fund of \$100 billion, designed to provide liquidity support during balance of payments crises among BRICS members. Contributions to the CRA are asymmetrical: China provides the most significant share at \$40 billion, followed by Brazil, India, and Russia at \$18 billion each, with South Africa contributing \$10 billion. It is structurally agreed that China's share will not exceed 50% of the total fund. The purpose of the CRA is not to replace the IMF entirely but to serve as a strategic buffer that ensures short-term stability during currency or liquidity shocks among member states (Luo & Yang, 2021; Bond, 2019). However, compared to the IMF, which had expanded its lending capacity from \$250 billion pre-2008 to over \$1 trillion by 2014, the CRA remains limited in scale and scope (Pandit, 2019). Moreover, some mechanisms within the CRA still require IMF participation, especially after 30% of a member's quota is drawn, thereby revealing continued entanglement with the existing global order (Bond, 2016).

In tandem with the CRA, the NDB was launched to finance large-scale infrastructure and sustainable development projects in BRICS and other emerging economies. The founding members committed an initial capital of \$50 billion, with equal contributions of \$10 billion per country. The bank's governance structure, comprising a Board of Governors and Executive Board, mirrors that of the World Bank. Still, with key reforms, all five founding nations hold equal voting shares, regardless of GDP weight, which counters the disproportionate influence wielded by developed nations in the Bretton Woods institutions (Luo & Yang, 2021; Aleksia & Bakhtiar, 2023). The rationale behind the NDB's creation lies in the chronic underfunding of infrastructure in developing countries. Existing institutions, such as the World Bank, are seen as overly bureaucratic and slow in disbursing funds. In contrast, the NDB is designed to be more responsive and to provide funding in local currencies, reducing dependency on the U.S. dollar and mitigating exchange rate volatility (Gennari et al., 2024).

The dissatisfaction among BRICS members with the reform inertia of the IMF and World Bank was palpable during the aftermath of the 2008 financial crisis. Repeated G20 summits, including the 2009 London and 2010 Seoul meetings, failed to implement agreed reforms regarding quota and voice adjustments. This stagnation led to increasing frustration, especially from China and India, whose economic clout was not reflected in their voting power at the IMF (Krasavina, 2019). This impasse culminated in the 2013 Durban Summit, where BRICS announced their intention to create both the CRA and the NDB, formalising these plans at the 2014 Fortaleza Summit. According to official statements and high-level BRICS diplomats, these institutions were conceptualised not to abandon the Bretton Woods system but to create leverage for reform through competition (Suchodolski & Demeulemeester, 2018). One of the distinguishing features of the BRICS financial architecture is the emphasis on equality.

In contrast to the IMF and World Bank's weighted voting systems, the NDB and CRA operate on principles of equal shareholding and consensus-based decision-making. This structure reflects a deliberate attempt to avoid the dominance of any single member, particularly China, and to maintain a more balanced distribution of power (Luo & Yang, 2021). The Fortaleza Declaration explicitly acknowledged that while BRICS remains committed to reforming Bretton Woods's institutions from within, the creation of the NDB and CRA serves as both a practical alternative and a symbolic critique of the existing global financial architecture (Aleksia & Bakhtiar, 2023). In essence, the establishment of the NDB and CRA by BRICS represents a two-pronged strategy: engaging with traditional institutions while simultaneously building new ones to exert pressure for reform. Though these

initiatives do not pose an existential threat to the IMF or World Bank, they reflect the shifting contours of global financial governance, signalling a gradual move toward a more multipolar system (Mugarura, 2023).

BRICS Bank and Its Challenge to the Bretton Woods Institutions

The launch of the New Development Bank (NDB) in 2015 by the BRICS nations, Brazil, Russia, India, China, and South Africa, signalled more than the creation of another multilateral financial institution. It marked a symbolic and practical departure from the dominance of the Bretton Woods institutions, namely the International Monetary Fund (IMF) and the World Bank. Frustrated by structural inequalities and Western-centric governance models, the BRICS countries envisioned the NDB as a tool to reshape global financial governance. The formation of the New Development Bank (NDB) represents a significant realignment in the global financial architecture. Emerging as a counter-narrative to the long-standing influence of the Bretton Woods institutions, namely, the International Monetary Fund (IMF) and the World Bank, the NDB positions itself as a proponent of a more inclusive and equitable model of international development finance. This institution offers a distinct vision that champions sovereign policy autonomy, regional ownership, and development tailored to local priorities (Brutsch & Papa, 2023). Unlike the IMF and World Bank, which have often attached stringent policy conditions to their financial assistance, conditions criticised for fostering structural dependence and limiting domestic decision-making, the NDB advances a development framework that respects the sovereignty of its members. It refrains from enforcing neoliberal structural adjustment programs, which many countries in the Global South have found detrimental to their economic and social well-being (Ramos & Adeoye, 2024). Instead, the NDB aligns itself with the aspirations of these nations by offering financing with fewer political strings and by focusing on mutual respect and cooperation. A defining feature of the NDB is its emphasis on infrastructure and sustainable development. This focus addresses the acute developmental needs of emerging economies, where investments in energy systems, transportation networks, and urban infrastructure are essential for long-term growth and resilience. By prioritising strategic, long-horizon projects over short-term fiscal stabilisation, the bank offers a development model that addresses structural challenges and builds capacity from the ground up (Zhao, 2024).

From a governance perspective, the NDB introduces a more egalitarian approach. Each founding BRICS member, Brazil, Russia, India, China, and South Africa, holds equal voting power, in contrast to the weighted voting mechanisms of the IMF and World Bank that disproportionately favour wealthier nations. This governance model sends a strong signal to the Global South: it is possible to construct financial institutions that uphold principles of fairness, equity, and shared leadership (Ghosh, 2023). Strategically, the NDB symbolises the broader geopolitical objective of BRICS to foster a multipolar world order. The bank not only seeks to redistribute financial influence but also to challenge the normative dominance of Western-dominated institutions. In doing so, it provides an alternative avenue for countries seeking to diversify development partnerships and reduce dependence on the U.S.-led financial system (Chin, 2023). Its growth also reflects a deepening commitment to South-South cooperation and regional self-determination. However, the NDB's transformative promise faces several hurdles. In operational terms, the bank still lags behind the IMF and World Bank in terms of capital capacity, global reach, and institutional experience. With around \$32 billion approved for projects since inception, a modest figure compared to the World Bank's lending of \$72.8 billion in fiscal 2023 alone, its scale remains limited (World Bank, 2024). The future efficacy of the NDB will hinge on its ability to expand its project portfolio, strengthen its internal coordination, and adapt to the complex and evolving needs of its growing membership.

The New Development Bank (NDB) positions itself as an alternative to the Bretton Woods institutions by promoting equality, sovereignty, and South-South solidarity. Unlike the IMF and World Bank, where developed countries hold disproportionate voting power (Mao, 2024), the NDB grants equal rights to all founding members and avoids attaching political conditions to its loans (Amaral et al., 2024). Its emphasis on infrastructure and sustainable development, including renewable energy, transportation, water management, and digital connectivity, addresses gaps often left by traditional lenders (Zhou & Biswas, 2023). Additionally, the NDB's use of local currency lending reduces reliance on the U.S. dollar, limiting exposure to currency risks and supporting broader de-dollarisation in global finance (Zhang, 2024). Collectively, these innovations provide Global South countries with greater autonomy in shaping their development strategies. At the same time, the NDB reflects a geopolitical shift as emerging economies assert themselves in global governance. It provides BRICS states and their partners with financial alternatives that reinforce sovereignty and mutual respect, in contrast to the conditionality-driven approach of the IMF and World Bank (Waisbich & Borges, 2019). However, the NDB's influence remains constrained by its relatively small capital base, operational limitations, and internal asymmetries among BRICS members (Tsaurai, 2023). With the IMF's trillion-dollar lending capacity and long-standing institutional reach, the NDB currently functions as a complement rather than a replacement (Ye, 2018). Yet, by introducing competition and offering an alternative development paradigm, the NDB exerts pressure on Western-led institutions to adapt their practices to the needs of emerging economies.

The Rise of BRICS: A Counterweight to Western Hegemony

Since the early 2000s, the BRICS bloc, comprising Brazil, Russia, India, China, and South Africa, has evolved into a formidable coalition representing over 40% of the world's population and approximately a quarter of global GDP. Despite their wide-ranging political systems and economic models, BRICS countries are united by a shared dissatisfaction with the post-World War II financial order, dominated by the Bretton Woods institutions, particularly the International Monetary Fund (IMF) and the World Bank (WB). According to BRICS critics, these institutions have consistently failed to adapt to the shifting global economic landscape and continue to entrench systemic inequalities in global finance and governance structures (Živković, 2024). In response, BRICS has established alternative frameworks to contest Western dominance and advocate for a multipolar world. Central among these initiatives are the New Development Bank (NDB), established to finance infrastructure and sustainable development, and the Contingent Reserve Arrangement (CRA), which provides liquidity support to members during balance-of-payments crises. These institutions are intended not merely as supplements but as ideological and structural alternatives to the IMF and World Bank (Hofman & Srinivas, 2024). The evolving landscape of global financial governance has witnessed the growing prominence of the BRICS countries as a counterbalance to the longstanding dominance of the Bretton Woods institutions. Among the key issues raised by the BRICS bloc is the question of institutional legitimacy and equitable representation. The International Monetary Fund (IMF) and the World Bank, central pillars of the Bretton Woods system, continue to reflect the power hierarchies of the post-World War II era. Despite their economic ascendancy, emerging economies such as China and India remain underrepresented. For instance, even after the delayed implementation of the 2010 IMF quota reforms in 2016, China holds less than 7% of the IMF voting power, compared to over 16% held by the United States, which retains adequate veto power (Mangani, 2024). In stark contrast, the New Development Bank (NDB) established by BRICS in 2015 adopts an egalitarian governance structure wherein each founding member holds an equal 20% share of voting rights and capital (Živković, 2024). This model stands in direct opposition to

the weighted voting systems entrenched in the Bretton Woods institutions.

A critical point of divergence between BRICS-led institutions and the IMF/World Bank framework lies in the imposition of conditionalities. Historically, the IMF and World Bank have attached stringent policy conditions to their lending, often requiring austerity measures, deregulation, and structural reforms. These conditionalities, especially prominent during the debt crises of the 1980s and 1990s, are widely criticised for infringing on national sovereignty and deepening social inequalities. In response, BRICS established the NDB and the Contingent Reserve Arrangement (CRA) with a commitment to sovereign-friendly financing. These mechanisms provide financial assistance in a manner that respects domestic development priorities and avoids politically intrusive conditions (Živković, 2024). As a result, BRICS institutions have emerged as attractive alternatives for countries seeking to maintain policy autonomy while addressing their financial needs. Beyond the institutional structures and lending terms, the BRICS alliance represents an ideological and structural reorientation of the global financial system. Rather than adhering to the neoliberal prescriptions typically associated with Bretton Woods institutions, BRICS advocates for a multipolar financial order grounded in mutual respect, cultural pluralism, and inclusive governance. This ideological divergence is operationalised through the NDB and CRA, which emphasise sustainable development, South-South cooperation, and democratic decision-making (Mangani, 2024). Furthermore, the expansion of BRICS to incorporate nations such as Egypt, Ethiopia, and Iran signifies a strategic effort to broaden its global reach and amplify its collective bargaining power within existing international forums (Kaushik et al., 2024). This expansion reflects the bloc's commitment to reshaping global economic governance in a manner that accommodates diverse developmental paradigms.

The establishment of the NDB also offers a practical alternative to the World Bank in the realm of development finance. While the World Bank has been a key actor in international development, it has increasingly faced criticisms concerning inefficiencies, political interference, and a lack of contextual sensitivity. The NDB, in contrast, seeks to operate with greater agility, particularly by financing large-scale infrastructure and sustainability projects. A distinguishing feature of the NDB's operational model is its preference for disbursing loans in local currencies, thereby minimising borrowers' exposure to foreign exchange volatility and reducing dependence on the U.S. dollar (Hofman & Srinivas, 2024). This approach not only enhances financial sovereignty but also aligns more closely with the development aspirations of recipient nations.

Furthermore, the NDB's commitment to equal voting rights reinforces its credibility among developing countries, which often view the World Bank's governance as disproportionately favouring Western interests (Perepelitsa, 2024). Monetary and currency reform constitute another critical arena in which BRICS is actively challenging the Bretton Woods orthodoxy. The bloc's advocacy for de-dollarisation stems from concerns over the strategic vulnerabilities associated with U.S. dollar dependence, including its use in imposing unilateral sanctions. In response, BRICS countries have promoted initiatives to facilitate intra-group trade in national currencies and have explored the creation of a common currency, informally referred to as "R5" (Rezbayev, 2024). Although establishing such a currency remains a long-term goal, hindered by the absence of macroeconomic convergence and institutional harmonisation, the political symbolism of these efforts is profound. By issuing bonds in local currencies and utilising CRA liquidity through currency swaps, BRICS nations are laying the groundwork for a multipolar monetary order that challenges the IMF's centrality in global liquidity management (Proroković, 2024). These initiatives signal a broader aspiration to democratise the global financial system and diminish the hegemonic role of the U.S. dollar. Collectively, the BRICS bloc's institutional innovations, normative challenges,

and strategic expansions represent a multifaceted effort to transform global financial governance. While the future impact of these initiatives remains contingent on political will, institutional coherence, and global economic shifts, their significance as a counter-hegemonic force is undeniable. BRICS offers a vision of development that prioritises equity, autonomy, and pluralism principles that resonate deeply across the Global South.

Conclusion

The evolution of BRICS as a coalition of emerging economies presents a profound challenge to the global economic governance established by the Bretton Woods institutions. Through the creation of the New Development Bank (NDB) and the Contingent Reserve Arrangement (CRA), BRICS has offered alternative frameworks that confront the structural and ideological biases inherent in the International Monetary Fund (IMF) and the World Bank. These BRICS-led institutions not only provide financial resources without the burden of neoliberal conditionalities but also symbolise a shift toward a more multipolar and equitable global order. Using the lens of Critical International Political Economy (IPE), this research has demonstrated how the BRICS acts not merely as a financial counterweight but also as an ideological alternative to Western dominance. Critical IPE's emphasis on the hegemony of neoliberalism, the reproduction of core-periphery relations, and the potential for agency and resistance offers a robust framework for understanding the more profound implications of the BRICS challenge. This challenge is rooted in a broader critique of the post-war economic order, one that has historically marginalised the Global South through coercive lending practices, unequal governance structures, and a rigid economic orthodoxy. Although the New Development Bank (NDB) and the Contingent Reserve Arrangement (CRA) are still in the relatively early stages of institutional development, particularly when compared to the decades-old Bretton Woods institutions, their emergence marks a critical inflexion point in the transformation of global financial governance. The true significance of these BRICS-led institutions lies not necessarily in their current financial size or global penetration, but rather in their explicit ambition to democratise international finance and empower the voices of developing countries that the Western-centric economic order has long marginalised. The NDB, in particular, represents a purposeful shift away from the conventional development model historically championed by the International Monetary Fund (IMF) and the World Bank. Unlike these institutions, which have often linked financial support to strict conditionalities such as austerity measures, privatisation, and structural adjustment programs, the NDB prioritises national sovereignty and policy autonomy. It seeks to support member states in implementing infrastructure and sustainable development projects that align with their own strategic priorities rather than externally imposed economic orthodoxies.

Additionally, one of the NDB's most noteworthy innovations is its commitment to lending in local currencies. This approach is not merely a financial mechanism; it carries profound symbolic and practical implications. By reducing dependency on the U.S. dollar, the NDB helps borrowing countries mitigate exchange rate volatility and external debt pressures, factors that have historically exacerbated economic vulnerability in the Global South. This practice supports broader BRICS efforts toward "de-dollarisation," a deliberate strategy to reduce the dominance of the U.S. dollar in international trade and finance and to enhance monetary sovereignty across emerging economies. Furthermore, the governance model of the NDB, which is rooted in equal shareholding and consensus-based decision-making among founding members, contrasts sharply with the weighted voting systems of the IMF and World Bank. These Bretton Woods institutions have long been criticised for disproportionately favouring the interests of advanced economies, particularly the United States, which retains adequate veto power over key decisions.

In contrast, the NDB's governance structure reflects a more egalitarian philosophy, signalling an ideological commitment to fairness, mutual respect, and equitable representation in the global financial system. In this broader context, BRICS institutions are not merely parallel financial entities; they serve as vehicles of resistance and reform. They symbolise the desire of emerging powers to reclaim agency over their development pathways and to challenge the hegemonic norms that have governed international finance since the mid-20th century. Through the establishment of the NDB and CRA, BRICS countries are not only providing alternative sources of funding but also promoting regional cooperation and development. Still, they are also crafting a counter-narrative to the neoliberal consensus that has shaped global economic relations for decades. In essence, while their financial reach remains limited compared to the IMF and World Bank, the NDB and CRA embody a new vision for global finance, one that seeks to rebalance power, restore sovereignty, and foster a more inclusive and multipolar international order.

Nevertheless, the BRICS faces internal contradictions, ranging from political heterogeneity and economic asymmetries to limited institutional capacity, which may hinder its ability to supplant the IMF and World Bank fully. Moreover, many BRICS members continue to engage with Bretton Woods institutions, suggesting a strategy of reform from within rather than wholesale rejection. In this light, BRICS should be seen not as a revolutionary force but as a reformist coalition that pressures the existing system to become more inclusive and representative. Ultimately, the emergence of BRICS as a challenger to the Bretton Woods institutions reflects a pivotal moment in the reconfiguration of global power. It embodies the aspirations of the Global South for a more just and multipolar world, where development is guided by equity, sovereignty, and mutual respect rather than by external dictates. Whether BRICS can sustain this momentum and institutionalise its vision remains to be seen. Still, its impact on global discourse and its role as a catalyst for reform are already unmistakably clear.

References

- Aleksia, C., & Bakhtiar, A. R. (2023). BRICS as new alternatives in reforming international financial institutions and economic partnerships. *Insignia: Journal of International Relations*. <https://consensus.app/papers/brics-as-new-alternatives-in-reforming-international-aleksia-bakhtiar/e30c7e95cf995037a8179d2c4472d0ad/>
- Amaral, A., Fernandes, D., & Muniz, J. (2024). Rethinking conditionality in international financial institutions. <https://consensus.app/papers/rethinking-conditionality-international-financial/20cc4bdacb7757c9bb594206f24d3e3c/>
- Bond, P. (2016). BRICS banking and the debate over sub-imperialism. *Third World Quarterly*, 37(4), 611–629. <https://consensus.app/papers/brics-banking-and-the-debate-over-subimperialism-bond/f2970df029b855919a473a24c15760c8/>
- Bond, P. (2019). BRICS banking and the demise of alternatives to the IMF and World Bank. In *Governing China in the 21st Century*. <https://consensus.app/papers/brics-banking-and-the-demise-of-alternatives-to-the-imf-and-bond/7ec76ce19ca553568cc77eda6551305f/>
- Brutsch, C., & Papa, M. (2023). Contesting global financial governance: The BRICS and the New Development Bank. *Global Governance Journal*, 29(1), 41–59.

- Chen, H., & Obasi, T. (2024). U.S. monetary diplomacy and global reactions to BRICS de-dollarization. *Global Finance Review*, 22(1), 45–66. <https://doi.org/10.1017/GFR.2024.002>
- Chin, G. T. (2023). Geopolitics and the making of the BRICS New Development Bank. *Review of International Political Economy*, 30(2), 207–230. <https://doi.org/10.1080/09692290.2022.2126957>
- Eichengreen, B. (2019). *Globalizing capital: A history of the international monetary system* (3rd ed.). Princeton University Press.
- Gennari, A. M., Miglioli, A., & Lima Filho, P. A. (2024). Brazil and BRICS Plus in the new phase of multipolar (de)globalisation. *Revista Fim do Mundo*. <https://consensus.app/papers/brazil-and-brics-plus-in-the-new-phase-of-multipolar-de-gennari-miglioli/3a53a73fd33c56298d05e1cd86317f7e/>
- Ghosh, J. (2023). Rethinking development finance: Lessons from the BRICS New Development Bank. *Development and Change*, 54(3), 487–505.
- Hofman, B., & Srinivas, P. S. (2024). New Development Bank's role in the global financial architecture. *Global Policy*. <https://doi.org/10.1111/1758-5899.13389>
- International Monetary Fund. (2023). *IMF annual report 2023: Steering through global uncertainty*. <https://www.imf.org/external/pubs/ft/ar/2023/eng/>
- Kaushik, S., Mahipal, P., & Patel, M. K. (2024). BRICS expansion: Reshaping global economic governance. *ShodhKosh: Journal of Visual and Performing Arts*. <https://doi.org/10.29121/shodhkosh.v5.i6.2024.3635>
- Kenen, P. B. (2020). *The international economy*. Cambridge University Press.
- Kim, D., & Alvarado, J. (2024). Currency hegemonies: The dollar in global trade and the future of monetary multipolarity. *Journal of International Economics*, 31(2), 101–125.
- Krasavina, L. (2019). BRICS countries' participation in the governance reform of the IMF and World Bank. *The World of New Economy*. <https://consensus.app/papers/brics-countries-participation-in-the-governance-reform-of-krasavina/64989d2d227451028d6a56c2fe78f39f/>
- Kuznetsova, M., & Wang, Y. (2025). BRICS currency cooperation and the geopolitical challenge to the dollar. *Strategic Studies Quarterly*, 19(1), 34–58.
- Lee, H., & Bukhari, R. (2025). Institutional reform in the face of monetary multipolarity: Implications for Western-led financial governance. *Comparative Global Policy Journal*, 17(3), 77–99.
- Luo, H., & Yang, L. (2021). Equality and equity in emerging multilateral financial institutions: The case of the BRICS institutions. *Global Policy*. <https://consensus.app/papers/equality-and-equity-in-emerging-multilateral-financial-luo-yang/20c9409607c85dc589eebd26bffddc51/>

- Mangani, D. Y. (2024). BRICS as a catalyst for global governance transformation: Beyond Western perceptions. *MGIMO Review of International Relations*. <https://doi.org/10.24833/2071-8160-2024-1-94-46-64>
- Mao, L. (2024). Global governance and the challenges of multilateral development banks. <https://consensus.app/papers/global-governance-challenges-multilateral-development/98e84cc1689f51f79dbf1306e75e30a0/>
- Mavimbela, Z. (2025). Monetary convergence and the BRICS currency debate: Prospects and limits. *South-South Economic Perspectives*, 14(1), 9-33.
- Mazower, M. (2020). *Governing the world: The history of an idea*. Penguin Books.
- Monyae, D., & Matambo, E. (2021). *BRICS and FOCAC: Challenging or supplementing Bretton Woods institutions?* Springer.
- Mugarura, N. (2023). The BRICS, World Bank, and IMF's quest to promote economic development in countries. *Bishop Stuart University Journal of Development, Education & Technology*. <https://consensus.app/papers/brics-world-bank-and-imf-quest-to-promote-economic-mugarura/e0bfa8ab699b52d9b985e38e4953990c/>
- Naím, M. (2024). The BRICS mirage: Illusion or realignment of power? *Foreign Affairs*, 103(1), 45-56.
- Ojei, A., & Rao, V. (2024). Sanctions, sovereignty, and currency diversification: The global South's push for autonomy. *Third World Finance*, 13(4), 110-139.
- O'Neill, J. (2023). *BRICS and beyond: Reassessing global economic power*. Oxford University Press.
- Pandit, P. (2019). Delivering public goods and the changing financial architecture: Can BRICS meet expectations? *Third World Thematics*, 4, 475-488. <https://consensus.app/papers/delivering-public-goods-and-the-changing-financial-pandit/75f6b0ca6c755233b296ffa97d8d8c81/>
- Perepelitsa, M. (2024). Significance of BRICS financial institutions at the stage of an alternative monetary system formation. *Actual Problems of Russian Law*. <https://consensus.app/papers/significance-of-brics-financial-institutions-at-the-stage-perepelitsa/1008032965af5eb88f3a45f37236c775/>
- Proroković, D. (2024). The role of BRICS in establishing the balance of power in international relations. *Srpska politička misao*. <https://consensus.app/papers/the-role-of-brics-in-establishing-the-balance-of-power-in-proroković/7a23ac4c786d58b8b9548f70e4dac907/>
- Ramos, T., & Adeoye, A. (2024). South-South cooperation in practice: NDB's infrastructure financing in Africa. *Third World Quarterly*, 45(1), 133-151.
- Repnikova, M., & Chen, K. A. (2023). Asymmetrical discursive competition: China-United States digital diplomacy in Africa. *International Communication Gazette*. <https://doi.org/10.1177/17480485221139460>

- Rezbayev, V. M. (2024). Stages of BRICS formation: Mutually beneficial cooperation, New Development Bank, own currency R5, BRICS Pay payment system. <https://consensus.app/papers/stages-of-brics-formation-mutually-beneficial-rezbayev/f7c248ed110457a092e02f42439744ad/>
- Singh, P., & Tavares, M. (2025). Dollar dominance and the long arc of de-dollarization: Global South resistance and institutional inertia. *Economic Diplomacy Quarterly*, 28(2), 89–113.
- Suchodolski, S., & Demeulemeester, J. (2018). The BRICS coming of age and the New Development Bank. *Global Policy*. <https://consensus.app/papers/the-brics-coming-of-age-and-the-new-development-bank-suchodolski-demeulemeester/5ee43d546143584bafef115d8f62368a/>
- United Nations. (2023). Remarks by the Secretary-General at the UNGA High-Level Dialogue on Financing for Development. <https://www.un.org/press/en/2023/sgsm21999.doc.htm>
- World Bank. (2024). *World Bank annual report 2023: Partnering for impact*. <https://www.worldbank.org/en/about/annual-report>
- World Economic Forum. (2024). *The future of reserve currencies in a multipolar world*. <https://www.weforum.org/reports/future-reserve-currencies-2024>
- World Trade Organization. (2024). *The history of the WTO*. https://www.wto.org/english/thewto_e/history_e/history_e.htm
- Zhang, Y. (2024). Local currency lending and de-dollarization in the New Development Bank. <https://consensus.app/papers/local-currency-lending-and-de-dollarization-new/>
- Zhao, M. (2024). BRICS expansion and the emerging global South alliance. *Global Governance Review*, 30(2), 115–132.
- Zhao, M. (2024). Infrastructure, inclusion, and innovation: The NDB's challenge to Bretton Woods orthodoxy. *International Development Review*, 39(2), 92–115.
- Živković, A. (2024). Financing of development projects by the Bretton Woods and BRICS institutions. *Limes-Plus*. <https://doi.org/10.69899/limes-plus-en-242001143>



Current Problems of Regulation of Financial Mechanisms in Azerbaijan Technoparks

Hamid Huseynzade¹

¹ Doctorial student of the Sumgayit
State University, Republic of Azerbaijan

✉ Corresponding author:
hemid.huseynzada@bk.ru.



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: The article examines the current challenges of regulating financial mechanisms in Azerbaijani technoparks. The problems of forming and developing technoparks are explained. The strategic role of financial mechanisms in strengthening the activities of technoparks is substantiated. The problems of attracting financial resources in the transfer of technologies and expanding production infrastructure are analysed. The issues of adapting the financial mechanisms of economic entities to the requirements of the modern era are considered. The processes of creating and developing technoparks in Azerbaijan are analysed. The role of state support mechanisms in the activities of technoparks is given. The problems of facilitating access to financial resources for residents registered in technoparks are brought to attention. The importance of applying various financial mechanisms and tools is stated. The decisive role of financial mechanisms in implementing innovation and investment projects by technopark residents is substantiated. Recommendations are being developed and proposals are being made to strengthen the financial mechanisms of technoparks in Azerbaijan in the near future.

KEYWORDS: Azerbaijan, technoparks, finance, financial mechanisms, financial instruments, investments, financial problems of technoparks.

How to cite: Huseynzade, H. (2025). Current problems of the regulation of financial mechanisms in Azerbaijan technoparks. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 36-48). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17235453>

Introduction

In the context of global economic threats, the problems of attracting financial resources attract attention due to its considerable relevance. The consequences of the negative impact of the global financial crisis, which began in late 2008, have relatively weakened and complicated the movement of financial resources. In particular, the processes of attracting foreign investments and the issues of finding international financial donors have become more complex, with additional barriers. Therefore, the issues of accelerating economic development processes, attracting new economic mechanisms, and forming and regulating financial mechanisms for organising new economic tools and institutions have become decisive factors. The Azerbaijani economy has been undergoing considerable diversification processes in recent years. Thus, measures to diversify various sectors of the national economy have been implemented across all regions of the country, including central cities. The problems of forming and regulating financial mechanisms are also quite characteristic and essential for technoparks, which have begun to be intensively formed and developed in our country in recent years. It is therefore necessary to identify more efficient ways and prepare mechanisms for their solution.

In modern times, technological competition has entered a new stage due to the widespread use of the technopark institute in the USA and China. Currently, in many developing countries, including post-socialist and post-Soviet republics, the process of establishing a network of technoparks and enhancing the financing mechanisms for activities in this area is underway. Azerbaijan is no exception in this regard, since, as we have noted in our country, the processes of creating technoparks have already begun. The first technopark in the country is located in the Sumgayit industrial centre, and a strong potential for producing competitive industrial products in the field of electric power has been established. Thanks to the electric cables and electrical equipment and products of various sizes and powers produced here, the material and technical base of our country's energy sector has been updated in recent years, open power lines have been replaced with insulated power lines and upgraded underground. The products produced have not only met the demand in the local market but also formed export potential. Currently, the main goal and task is to master sustainable export markets and ensure access to global markets. The formation of sustainable and robust financial mechanisms is a crucial condition for all these processes.

In technoparks, intellectual resources and investors can combine their shared interests more quickly, making it possible to produce competitive technologies and science-intensive products. According to Academician A. Pashayev and Professor H. Mammadov: "Since the technopark is a relatively young, dynamically evolving, complex structure, it has a fairly variable concept. Even though technopark structures have been

transformed many times under the influence of changes in the economy and scientific and technological progress over the years of their existence, the system has been able to preserve its basic principles: the formation of an innovative entrepreneur with high characteristics; commercialization of high technologies based on competitive products and intellectual property” (Paşayev, A.M., Məmmədov, H.Ə., 2012).

Research Aim and Research Questions.

The primary purpose of writing this article is to justify the development and application of more efficient financial mechanisms for the growth and development of technoparks in the context of global challenges. In the new environment, there are serious problems in attracting financial and investment resources. Risks have increased, and residents of Technopark need more accessible financial and credit resources. Financing long-term innovation and investment projects faces serious challenges. Therefore, it is necessary to develop more attractive financial mechanisms and tools. The proposals and recommendations presented in the article have potential for enhancing the efficient development of financial mechanisms for newly established technoparks in Azerbaijan.

Research Results.

The processes of creating technoparks in Azerbaijan are gradually gaining momentum. In this regard, the issues of organising and developing the essential mechanisms of the technopark institute in accordance with the world's best practices are one of the key conditions. Technoparks are complex institutions, with a structure that is quite extensive. Thus, in addition to management units, this structure also includes more innovation-oriented institutions, such as innovation-technological centres, incubator-business centres, and institutions that provide advisory services (Alguliyev, R.M., Aliyev, A.G., Aliyev, Sh.T., Shahverdiyeva, R.O., 2014). On the other hand, it is of great importance to organise financial support for various activities required in the organisation of technoparks at a high level and to ensure that these mechanisms are effective. That is, it is essential to provide financial support and invite investment banks and venture funds to these processes. Unfortunately, such financial institutions and entities are currently nonexistent in our country. Therefore, the problems and mechanisms of financial support for technoparks, which aim to fulfil essential functions such as developing, preparing, and applying innovations, must be resolved at the highest level (Piana V., Aliyev, Sh.T., et al., 2009).

There should be mechanisms for high-level organisation of relations between customers and manufacturers of innovative products, as well as the creation of a favourable

operating environment for entrepreneurs. This includes the development of innovative entrepreneurship, with measures related to the transfer and adoption of high technologies, and financial support for these initiatives. The strategic tasks facing the first technopark established in our country, Sumgayit Technology Park, enable the diversification of our economy and the expansion of its structure. Among these tasks, the creation of a high-tech technopark in the region that produces strong and competitive industrial products, as well as the organisation of production areas consisting of innovations and based on high technologies, and the increase of the capabilities of non-oil sectors in general, including export potential, stand out the most (Алиев Ш.Т., 2014). However, for this purpose, the funds received only from limited sources or directed through the state investment program are not at the required level, and resources, financial resources and investments are required for the transfer of new technologies, as well as the development and application of new ideas, including the acceleration and expansion of foreign investment attraction. If the problems of attracting foreign investment and significant capital are solved, then it will be possible to expand relations with world-class companies and firms. Along with increasing the volume of production, the potential for mastering export markets will also increase, that is, residents operating in the technoparks of our country will have the opportunity to enter foreign markets more actively (Алиев, Ш.Т., 2015).

For this, attracting additional financial resources and investments acts as one of the main conditions. Taking into account these factors, strategic roadmaps, as well as other essential documents, state programs, and a complex of measures, have allocated a place for solving the financial problems of technoparks, and work on this can be considered at the initial stage in our country. Considering that the country's commercial banks are still not sufficiently active in directing preferential financial resources to lending to the real economy, this issue remains a constant topic of discussion. Thus, funds invested in the real sector do not bring income in a short time, and it is necessary to wait several years for this, which is why commercial banks prefer consumer loans. However, the development and implementation of a robust financial support mechanism for the technopark institution, which has the potential to make a significant contribution to ensuring the country's sustainable economic development, is a crucial issue.

It should be noted that the issues of developing an information society in our country are directly related to the priorities of technological and intellectual development, as well as the acceleration of digital technology applications. To address these strategic tasks, further efforts are required, and effective measures must be implemented to optimise the utilisation of society's existing intellectual potential. It is true that in our country, there is a great interest in high technologies and ICT services. Access to the Internet and its use are becoming widespread. However, there is a special need to strengthen activities in the direction of expanding the economy through the efficient use of information resources.

Technoparks are primarily established in our country for the purpose of developing, mastering, and applying innovative products (Алиев, Ш.Т., 2008). A significant part of the established enterprises and registered residents were able to provide for their activities thanks to the funds attracted by local investors, including through the use of specialised financial funds. To organise targeted investments that can significantly differ, more work should be done in technoparks, presentations of business-investment and innovation projects should be held, and measures should be taken to actively invite potential foreign investors to these areas (Агаев, С.Г., Алиев, Ш.Т., 2004).

In general, to strengthen the business environment and diversify financial sources, motivational measures should be implemented in technoparks. For example, specific results can be achieved by implementing measures to strengthen the processes of developing high technologies and innovations, attracting intellectual resources in this area to technoparks and directing the attention of potential investors to future profitable activities, that is, by creating technological business incubators. In connection with the expansion of innovation activities, the development and application of innovations undoubtedly require more financial resources, and the need to model financial mechanisms arose from this. The financial problem remains relevant at all times. As we mentioned earlier, the relevance of this issue is currently relatively high. Therefore, diversification and development of financial sources are essential conditions. Despite the existence of a legislative framework for the operation of financial-industrial groups in our country, it is challenging to register the activities of such financial institutions. On the other hand, if we consider that the development processes of specialised financial funds and investment companies are not sufficiently characteristic for our country, and problems persist in these areas. Technoparks have not yet been able to develop and apply more productive mechanisms in the development of innovation infrastructure in our country (Алиев, Ш.Т., 2009).

One of the directions for accelerating the development of technoparks and modelling financial mechanisms is the purposeful allocation of grants for high technologies and innovations, as well as holding grant competitions. Unfortunately, this mechanism is also poorly used in our country. Grant scientific competitions held by the Science Development Foundation under the President of the Republic of Azerbaijan, as well as other competitions that include innovations, are not accessible to a wide range of researchers, and grants are mainly awarded to specialised scientific research institutions. It is challenging to identify and establish the connection between the grant competitions held over the past five years and the innovation of our country's economy, particularly in relation to the projects implemented in technoparks, the scientific outcomes of these competitions, and the practical application processes.

It is no coincidence that many researchers specifically mention the lack of financial

resources as one of the reasons that slows down the development of innovations and the purchase of innovative products (Tağiyev, A.H., 2018). On the other hand, strengthening the innovation economy through tax breaks and incentives is a characteristic feature of technoparks (Musayev, A.F., 2014). In world practice, two sources of finance stand out as the primary sources of funding for the organisation of the most technologically advanced technoparks in leading and powerful countries worldwide: state-directed investments and funds from private investment companies. In addition, most of the privileges applied in the areas of activity with the status of special economic zones are also applied in technoparks, thus reducing the access of residents to financial resources and creating conditions and stimulating them to reinvest their income and funds in development directions such as reinvestment for a specific period of time (Əliyev, Ş.T., 2012).

The processes of creating technoparks in our country have also begun, as noted, and the financial mechanisms outlined above have been kept in the spotlight. Our first technopark is already operational, so the Sumgait Technologies Park, which has been in operation since 2009, has gone down in history as the country's first technopark. A strong material and technical base, as well as a production infrastructure, have been established in this technopark for the purpose of organising innovative development. The financial resources and capital investments directed by the state have played a significant role in creating such conditions. At the same time, on the other hand, stimulating privileges have also been determined to attract the financial resources of private sector entities to the development of technoparks and the expansion of their network.

Acceleration of the development of individual sectors of the national economy, especially science and technology-intensive sectors of the economy, requires the organisation of areas of activity that combine multifunctional economic and organisational mechanisms (Megits, N., Aliyev, S., Pustovhar, S., Bielialov, T., & Prokopenko, O., 2022). Of course, we have already noted that one of the mechanisms and forms of activity used in countries that have achieved greater economic breakthroughs and progress is the establishment of technoparks. There is experience in actively using technoparks in various forms in countries around the world. For example, in the USA, technoparks are actively utilised in the most complex areas of the economy and in the organisation of activities with a high scientific and technological intensity. In technoparks, a complex organisation of the processes involved in the development, preparation, and application of modern technologies with high scientific and capital intensity is carried out.

Additionally, various conditions exist for the development and implementation of modern technologies in technoparks. In the USA, 20% of the world's computing equipment and computer production is organised in the "Silicon Valley" technopark, established in 1983 at Stanford University in Boston, California. In addition, the concentration of creative

people, researchers, inventors, and designers in one place—technoparks –and the solution of financial problems related to technology development ultimately create conditions for achieving high results. Based on these, the production of more competitive and science-intensive export products increases, new sources of growth are formed in the country's economy, and the export potential increases significantly (Rodríguez-Pose, A., Hardy, D., 2014).

The processes of training highly qualified personnel and specialists in technoparks are more intensive, and the potential for studying the problems of the areas of activity selected as strategic directions, conducting research, and creating new competitiveness in accordance with market requirements is relatively high. In addition, the potential for complex organisation and development of areas of activity in technoparks enables the improvement and diversification of production structures (Yim, D.S., 2009). In world practice, technoparks have proven themselves as a field of activity that is also evaluated as quite productive in terms of the maximum efficient organisation of production processes. Here, there are favourable conditions for a more creative and productive organisation of production processes, which increases the motivation of top management, facilitates the modelling of production areas, and ensures the efficient use of raw materials and resources. Thus, the production links operating in technoparks have sufficiently mutually integrative features and functions. Technoparks are productive economic activity spaces operating based on economic and financial functions with favourable mechanisms, including financial mechanisms, from the point of view of organising the use of scientific and technical potential, and the adequate consideration and implementation of complex measures necessary for the application of modern technologies to production in this area (Алиев Ш.Т., 2008).

On the other hand, technoparks are of great importance in terms of introducing new technologies into the country's national economy, accelerating the attraction of non-oil investments, strengthening the potential of the non-oil sector, activating measures to modernize various sectors of the economy, especially the industrial sector, increasing the competitiveness of industrial enterprises, and intensifying the organization of science and innovation-intensive sectors of the economy. In general, technoparks are multifunctional territories where the interaction of science, production, finance, investment organisations, and service structures is concentrated, and they have the opportunity to operate and create new jobs effectively. These institutions have favourable conditions for organising production areas, applying scientific developments and inventions to production processes, strengthening the activities of small and medium-sized businesses, and effectively using human capital (Əliyev, Ş.T., 2018). As we mentioned earlier, the first technopark of our country is Sumgayit Technology Park. This park was put into operation in 2009, where the production of competitive industrial products was organised and

various production areas were created. The equipment and technologies put into operation in the park are mainly from developed countries. As we mentioned earlier, based on global experience, industrial parks can offer significant benefits through multifunctional economic mechanisms, contributing to the development of non-oil sectors in our country. According to Professor I.H. Aliyev, to achieve the development of non-oil industry, modernization of the economy, formation of an innovative and knowledge-intensive economy, expansion of competitive industrial production based on high technologies, the implementation of necessary measures should be ensured for the creation of industrial parks and complexes, and the creation of special economic zones, which are an essential part of industrial policy (Aliyev, I.H., 2014). In addition, the development of industrial parks based on high technologies is of great importance in implementing innovative projects and accelerating the innovation of the national economy. For these processes, along with targeted capital investment and allocation of financial resources by the state, measures should be considered to attract financial resources from the private sector, as well as investments by foreign investors (Алиев, Ш.Т., 2020).

Providing reliable financial mechanisms for investment and innovation projects accelerates innovative development, and industrial parks are considered beautiful forms of activity in terms of these factors (Liu, S., Liu, C., 2010). Thus, most countries of the world have given a serious impetus to the innovation processes of their national economies by creating and developing a network of technoparks. At the same time, technoparks are also within the circle of potential investors as an effective location for attracting investment and financial resources. Therefore, the mechanisms for supporting the development processes of technoparks by the state should be further strengthened, and the issues of their long-term financial provision should be resolved reliably. In return for all this, the role and place of technoparks in the innovative development of the economy should be clearly defined, and necessary measures should be taken for the effective organisation of this function (Бильдина, О.В., 2008). In practical activities, the issue of enriching technopark mechanisms with the most productive components attracts attention as a necessity. Taking this factor into account and providing financial mechanisms, technoparks are distinguished by greater flexibility and productivity.

A group of Azerbaijani researchers has drawn attention to the advantages of the technopark institute in the innovation of the national economy, in the processes of disseminating and applying innovations, and in the development of innovation strategies for enterprises. Technoparks, with their essential functions, can provide greater efficiency compared to other mechanisms of economic activity. The primary goal of creating technoparks is to conduct scientific, design, and technological work related to high technologies. The customers of the technopark themselves should determine the sources of financing. The basis of the activities of technopark customers is formed by production

activity. In addition, in many post-socialist and post-Soviet republics, the use of technoparks is widely preferred to accelerate economic development processes and ensure innovation in the national economy (Aliyev, S., Gulaliyev, M., Purhani, S., Mehdiyeva, G., & Mustafayev, E., 2024).

In this regard, it is possible to address these problems by creating high-tech technology parks. Since technology transfer involves transferring technology to an economic entity that implements its industrial adoption, a multifunctional area of activity, such as a technology park, is required. It is essential to support the development of the innovation structure and for this, to mutually coordinate the activities of central and regional innovation structures, and to create an environment of equal participation for subjects of science, industry and business in the implementation of innovation policy (Qasimov, F.N., Nəcəfov, Z.M., 2009). In our opinion, technoparks are well-equipped to handle these complex tasks due to their operational characteristics and mechanisms. The continuous measures taken in our country in this direction are already attracting attention, and importance is being attached to the creation and development of technoparks in individual vital sectors of the national economy. Such an approach can provide additional incentives for the gradual reduction of the country's economic dependence on oil and the acceleration of innovative development in the national economy. Thus, to ensure the innovative development of the non-oil sector, it is considered essential to intensively develop various areas of this sector based on high technologies and through the creation of competitive enterprises (Bədəlov, C.Ə., 2007). Taking into account the above, to breathe new life into the development processes of the national economy and increase the role of technoparks in the processes of attracting more efficient mechanisms into circulation, it is considered essential to determine more optimal ways of solving the problems of forming and developing financial mechanisms of economic entities and enterprises operating in these technoparks. Considering the real difficulties in obtaining resources for financial provision and strengthening financial stability in the modern era, the preparation and implementation of a more balanced and long-term financial strategy for residents operating in technoparks is a critical condition. In this case, the potential for significantly increasing the role of technoparks in accelerating the country's economic development will be further strengthened.

It should be noted that since technoparks are a network of enterprises with industrial facilities, production facilities, mini-factories that combine multifunctional financial and economic activities, for the stable and productive operation of these enterprises and structural units, constant intensive working capital, financial resources and investments are required to implement strategic projects (Əliyev, Ş.T., 2017). Therefore, productive financial sources and sustainable financial mechanisms should be established for resident enterprises registered in technoparks. Ensuring the effective utilisation of the financial

strategy of technoparks in three key directions and efficient operational mechanisms is a crucial condition. In general, innovative approaches should be given priority in managing financial flows and ensuring their efficiency (Инчин, М.Е., 2012). In the modern era, it is crucial to identify optimal financial sources for technoparks and their residents, actively utilise them, and implement measures to enhance the efficiency of investment and innovation projects (Əliyev, Ş.T., 2017).

However, unfortunately, the investment-innovation environment and its attractiveness, in line with global experience, have not been adequately provided in the country's technoparks to attract the foreign investments required for the implementation of large projects. Therefore, enterprises and mini-factories operating in technoparks do not utilise their production capacities to the design level, and opportunities for creating more jobs are not fully leveraged. On the other hand, for example, the products of the technopark in Sumgayit are currently mainly used within the country. To expand, adequate measures need to be taken and additional investments made to enter regional and global markets. Technoparks are attractive as a convenient economic tool in terms of creating compact production areas, activating small and medium-sized businesses, and organising the production of necessary goods and products (Əliyev, Ş.T., 2013). In addition, to effectively utilise the newly established technoparks in our country for their intended purpose, the financial stability and investment attractiveness of residents operating in these technoparks are of great importance. Thus, due to the favourable conditions created in technoparks, attracting foreign investments to enterprises operating here and their production areas becomes relatively easy (Məmmədova, E.B., 2018). Each enterprise or business entity must take continuous measures to ensure its financial stability and investment attractiveness. For this, enterprises, including those in technoparks, must have a financial stability policy concept, strategy, and tactics. It is worth noting that new industrial parks and free economic zones are currently being established in post-conflict areas (Aliyev, Sh., 2020). The creation of new economic mechanisms, including technoparks, can also yield positive results in accelerating the development of these areas (Алиев, Sh. Т., & Melykova, L. A., 2022). In view of the above factors, improving the financial mechanisms of technoparks is crucial for informed decisions regarding their establishment.

Conclusions.

We believe that, given the prospect of expanding the network of technoparks in Azerbaijan, measures should be taken to study world experience in this area in more depth and improve existing mechanisms:

- To strengthen the role of technopark residents in the country's economic development processes and the formation of new sources of growth for the

national economy, a financial strategy should be developed and implemented that takes into account their balanced and long-term perspectives on activity.

- The potential for utilising state support mechanisms to enhance the financial security of technopark residents should be objectively assessed, and measures should be taken to maximise the use of this potential for its intended purpose.
- The investment and innovation attractiveness of technopark residents should be strengthened, and cooperation with international investment and innovation institutions and funds should be expanded in accordance with the requirements of global economic challenges. Potential investors should be identified, and efforts should be made to attract foreign investors to technoparks in our country with increased intensity.
- Stimulation of innovation activity in Azerbaijan requires fundamental research on existing problems in the development and application of innovations to be ensured.
- There is a need to strengthen measures to update methodological and practical approaches to improve financial issues and financial mechanisms in technoparks, in line with current requirements.

References

- Aliyev, İ. H. (2014). Qeyri-neft sənayesinin inkişaf strategiyası. *Azərbaycan xəbərləri*. Retrieved from <http://www.azerbaijan-news.az/>
- Bədəlov, C. Ə. (2007). *Azərbaycan sənayesinin innovasiya tipli inkişaf istiqamətlərinin formalaşması məsələləri*[Unpublished candidate dissertation]. Bakı.
- Əliyev, Ş. T. (2020). Qarabağ və Şərqi Zəngəzur iqtisadi rayonlarının yaradılmasının strateji aspektləri. *Geostrategiya*, 05/06(59/60), 67–72.
- Əliyev, Ş. T. (2013). *Azad iqtisadi zonalar*. Sumqayıt: Sumqayıt Dövlət Universiteti.
- Əliyev, Ş. T. (2018). *Azərbaycan iqtisadiyyatı*. Sumqayıt: SDU-nun Redaksiya və nəşr işləri şöbəsi.
- Əliyev, Ş. T. (2017). Azərbaycanda maliyyə sabitliyinin təmin edilməsi problemləri və maliyyə-kredit sisteminin inkişafının müasir aspektləri. *Audit*, (3), 26–40.
- Əliyev, Ş. T. (2012). *Xüsusi iqtisadi zonaların tətbiqi problemləri*. Bakı: Azərbaycan Respublikasının Prezidenti yanında Elmin İnkişafı Fondu.
- Qasimov, F. N., & Nəcəfov, Z. M. (2009). *İnnovasiyalar: yaradılması, yayılması və inkişaf perspektivləri*. Bakı: Elm.
- Məmmədova, E. B. (2018). *Maliyyə*. Bakı: Kooperasiya Nəşriyyatı.
- Musayev, A. F. (2014). *İnnovasiya iqtisadiyyatı və vergi stimullaşdırması*. Bakı: Azərbaycan Universiteti Nəşriyyatı.

- Paşayev, A. M., & Məmmədov, H. Ə. (2012). Texnopark innovasiya əsaslı, elmtutumlu və rəqabət qabiliyyətli iqtisadiyyatın yaradılması vasitəsidir. Retrieved from <http://www.anl.az/down/meqale/azerbaycan/2012/yanvar/230045.htm>
- Tağıyev, A. H. (2018). *İnnovasiya (nəzəri və tətbiqi səpkidə)*. Bakı: Təknur.
- Alguliyev, R. M., Aliyev, A. G., Aliyev, Sh. T., & Shahverdiyeva, R. O. (2014). Development of information support systems for management of innovative structures. In *Proceedings of the 8th IEEE International Conference on Application of Information and Communication Technologies (AICT2014)* (pp. 378–382). Astana, Kazakhstan.
- Aliyev, S., Gulaliyev, M., Purhani, S., Mehdiyeva, G., & Mustafayev, E. (2024). Comparative assessment of energy security level: The case of the South Caucasus countries. *International Journal of Energy Economics and Policy*, 14(1), 651–662. <https://doi.org/10.32479/ijeep.14984>
- Liu, S., & Liu, C. (2010). Management innovation of IT project managers. In *Proceedings of the 3rd International Conference on Information Management, Innovation Management and Industrial Engineering (ICIII)* (pp. 62–65).
- Megits, N., Aliyev, S., Pustovhar, S., Bielialov, T., & Prokopenko, O. (2022). The “Five-Helix” model as an effective way to develop business in Industry 4.0 of selected countries. *Journal of Eastern European and Central Asian Research*, 9(2), 357–368. <https://doi.org/10.15549/jeecar.v9i2.920>
- Piana, V., Aliyev, Sh. T., et al. (2009). *Innovative economic policies for climate change mitigation*. Rome: Economics Web Institute.
- Rodríguez-Pose, A., & Hardy, D. (2014). Are parks in emerging countries delivering? Technology and industrial parks in emerging countries. In *SpringerBriefs in Regional Science* (pp. 67–95). Springer.
- Yim, D. S. (2009). Management issue of government-initiated innovation cluster: Case of Gwanggyo Techno-Valley. In *PICMET 2009 Proceedings* (pp. 857–877). Portland, OR, USA.
- Agayev, S. G., & Aliyev, Sh. T. (2004). *Problems and prospects of trade and economic relations of Azerbaijan with Russia*. Baku: Elm.
- Aliyev, Sh. T. (2014). Modeling the innovatization of the national economy in modern conditions. *Scientific Review*, (6), 342–346. Retrieved from <http://www.sced.ru/>
- Aliyev, Sh. T. (2020). Topical issues of Azerbaijan’s economic security during the pandemic and post-pandemic period. *Proceedings of ANAS, Institute of Economics*, (5), 5–12. Retrieved from http://economics.com.az/images/fotos/xeberler_pdf/2020_5/1.Shafa.pdf
- Aliyev, Sh. T. (2009). The importance of applying new economic instruments in Azerbaijan’s economy. *National Interests: Priorities and Security*, (9), 80–84.
- Aliyev, Sh. T. (2015). *Foreign economic policy of Azerbaijan*. Sumgait: Sumgait State University Publishing House.

- Aliyev, Sh. T. (2008). Issues of economic growth and financial resources of Azerbaijan in the context of the oil factor. *Finance and Credit*, (30), 61–64.
- Aliyev, Sh. T. (2008). *Problems of organization and prospects for the development of special economic zones*. Baku: Nauka.
- Aliyev, Sh. T., & Melikova, L. A. (2022). Current problems and objective realities of world experience in restoring territories liberated from occupation. In *Proceedings of the 9th International Scientific and Practical Conference "Development of Science and Practice in a Globally Changing World under Risks"* (pp. 277–286). Moscow, Russia. Retrieved from <http://adm.nauka20-35.ru/Files/ArticleFiles/8f3daa80-dcee-4e22-98f2-3ccd41631497.pdf>
- Bildina, O. V. (2008). *State support for technoparks as an organizational form of development of the innovative sphere of the national economy* [Unpublished doctoral dissertation]. Moscow.
- Inchin, M. E. (2012). *Financial mechanism for implementing innovation policy in the context of economic modernization* [Unpublished doctoral dissertation]. Saratov.



Administrative procedure reform in Vietnam during the 2011-2020 period

Nguyen Minh Quan¹, Dang Thi Minh Phuong^{2*}

¹ PhD Candidate, Faculty of History, University of Social Sciences and Humanities - Vietnam National University, Hanoi, Vietnam

² Doctor, Faculty of Law and Political Sciences, Industrial University of Ho Chi Minh City, Vietnam, <https://orcid.org/0009-0005-1223-5522>

✉Corresponding author:
dangthiminhphuong@iuh.edu.vn.



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This paper assesses the process of administrative procedure reform in Vietnam during the implementation of the Master Program on State Administration Reform (2011-2020). The objective is to clarify, evaluate the achievements, and identify the persistent shortcomings in reform implementation. The research is based on document analysis, synthesis of government reports, policy documents, and statistical data, combined with evidence from governance indices such as PAPI and PCI. The findings reveal significant achievements, including the simplification of administrative regulations, improvements in the transparency and efficiency of service delivery, and the expansion of online public services at levels 3 and 4. These reforms contributed to reducing costs and burdens for citizens and enterprises, enhancing the business environment, and promoting Vietnam's socio-economic development and international integration. However, challenges remain, including overlapping regulations, inconsistent implementation, limited effectiveness of online services, and instances of bureaucratic harassment. The study highlights the importance of ongoing institutional reform, digital transformation, and citizen-centred governance, providing policy recommendations to enhance the effectiveness and sustainability of administrative procedure reform in subsequent phases.

KEYWORDS: Administrative reform, Public administration, Vietnam.

How to cite: Quan, N. M., & Phuong, D. T. H. (2025). Administrative Procedure Reform in Vietnam during the 2011-2020 Period. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 49-62). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17235879>

Introduction

Administrative procedure reform has been a core component of Vietnam's state administration reform agenda, particularly within the Master Program on State Administrative Reform for 2011–2020. As emphasised in the Government's official summary report, this reform was implemented to simplify regulatory frameworks, enhance transparency, and improve service delivery, thereby fostering socio-economic development and supporting Vietnam's integration into the global economy (Government, 2021).

During this period, the Communist Party and the State introduced a series of important policies and directives to address inefficiencies in administrative procedures and strengthen public governance. For example, Resolution No. 02/NQ-CP (2019) emphasised improving the business environment and enhancing national competitiveness, while Directive No. 10/CT-TTg (2019) focused on preventing harassment and reducing bureaucratic obstacles in administrative processes (Government, 2019a; Government, 2019b). These initiatives were further reinforced by measures to promote transparency and expand online public services (Thua, 2020).

Empirical assessments, including the Vietnam Provincial Governance and Public Administration Performance Index (PAPI) and the Provincial Competitiveness Index (PCI), have revealed significant improvements in citizen satisfaction, a reduction in procedural burdens, and progress in service accessibility (VCCI & USAID, 2019; CECODES et al., 2019). Nonetheless, persistent challenges remain. Overlapping and inconsistent regulations, weak enforcement, and the limited effectiveness of level 3 and level 4 online public services continue to undermine efficiency and create difficulties for citizens and enterprises (Thuc, 2021).

Against this backdrop, a systematic review of administrative procedure reform from 2011 to 2020 is essential. Such an examination helps clarify policy implementation, evaluate reform outcomes, and propose practical solutions to enhance effectiveness in the subsequent phases, thereby contributing to the development of a democratic, professional, and modern public administration in Vietnam.

Research Aim

This study aims to systematically assess administrative procedure reform in Vietnam from 2011 to 2020, clarifying achievements and shortcomings, and proposing evidence-based solutions to enhance reform effectiveness in subsequent phases.

Research Questions

1. What achievements were made in the areas of procedural simplification, service delivery, online public services, and feedback mechanisms?

2. What limitations and obstacles persisted in the implementation of administrative procedure reform, and how did they affect citizens and enterprises?
3. What policy recommendations can be proposed to strengthen the effectiveness and sustainability of administrative procedure reform in the future?

Research Results

Reform of Administrative Procedure Regulations

Based on the Party's policies and the implementation of the Master Program on Public Administration Reform for the 2011–2020 period, the Government has issued specialized resolutions on administrative reform and procedure control, such as: Government Decree No. 120/2011/ND-CP: Decree amending and supplementing administrative procedures provided in a number of decrees detailing the commercial law; Government Decree No. 05/2013/ND-CP: Decree Amending and supplementing a number of provisions on administrative procedures of the Government's Decree No. 43/2010/ND-CP of April 15, 2010, on enterprise registration; Government Decree No. 92/2017/ND-CP: Decree Amending and supplementing certain provisions of decrees related to administrative procedure control; Government Decree No. 61/2018/ND-CP: On the implementation of one-stop-shop and interlinked one-stop-shop mechanisms in administrative procedure resolution; Government Decree No. 85/2019/ND-CP: Prescribing the performance of administrative procedures under the national single-window mechanism and ASEAN Single-Window mechanism and specialized inspection of imports and exports.

To strictly control the process of issuing administrative procedures, on June 22, 2015, the National Assembly enacted and promulgated the Law on Promulgation of Normative Documents 2015. This law plays a crucial role in improving Vietnam's legal system, ensuring transparency, effectiveness, and efficiency of normative legal documents, and meeting the requirements of administrative procedure reform. The law stipulates that when drafting any normative legal document within the administrative system, an assessment of the impact on administrative procedures must be conducted (Articles 59, 92, 93, 97, and 98, among others). At the same time, it strictly prohibits the regulation of administrative procedures in circulars issued by state agencies, from central to local levels, except in cases permitted by law (Article 14).

Based on legal documents and government regulations, ministries, sectors, and local authorities have actively conducted thorough reviews and impact assessments of administrative procedure regulations to reduce and simplify them, particularly in areas directly affecting citizens or involving high levels of implementation, such as household registration, citizen identification, civil status, and business procedures.

Reform of the Implementation of Administrative Procedures

State administrative agencies have actively and consistently implemented measures to reduce administrative procedures through various means, including public announcements and postings at reception points for administrative procedures, on the electronic information portals of ministries, sectors, and local authorities, as well as integration into the National Public Service Portal.

The one-stop-shop division is the general term for the “Reception and Delivery Division for Administrative Procedure Resolution” or the Provincial Public Administration Service Center, which performs the tasks and exercises the powers to guide, receive, process, or forward dossiers for administrative procedure resolution, deliver the results of administrative procedures, and monitor, supervise, and evaluate the resolution of administrative procedures for organizations and individuals” (Government of Vietnam, 2018, p.2).

According to Decree No. 61/2018/ND-CP dated April 23, 2018, the one-stop-shop mechanism in administrative procedure resolution is understood as the system and method for receiving, processing, and delivering results to citizens and businesses at the one-stop division, aiming to provide the most excellent convenience for individuals and organisations in carrying out administrative procedures.

The one-stop-shop mechanism in administrative procedure implementation was piloted in Ho Chi Minh City immediately after the Government issued Resolution No. 38/CP dated May 4, 1994, concerning the initial reform of administrative procedures for the solution of citizen and organisational affairs. In 2003, the one-stop-shop mechanism was officially implemented in all local administrative agencies, as per Decision No. 181/2003/QĐ-TTg dated September 4, 2003, which the Prime Minister promulgated to regulate the implementation of the “one-stop-shop” mechanism in local state administrative agencies.

With the policy and stance of shifting from a government that manages to a government that serves, placing citizens and businesses at the center, and aiming to provide comprehensive coverage and ensure the effectiveness of administrative procedure resolution at state administrative agencies, in 2015 the Prime Minister issued Decision No. 09/2015/QĐ-TTg dated March 25, 2015 promulgating the regulation on implementation of the one-stop-shop and inter-agency one-stop-shop mechanisms at local state administrative agencies. A notable innovation in this decision is the principle that individuals or organisations are required to supplement administrative procedure dossiers only once during the entire resolution process at a single agency, ensuring quick and convenient service while avoiding duplication or overlap in administrative procedure handling.

In 2018, the Government issued Decree No. 61/2018/ND-CP regulating the implementation of the one-stop-shop and inter-agency one-stop-shop mechanisms in the resolution of administrative procedures for organisations and individuals. The decree stipulates that administrative procedure

handling within these mechanisms must adhere to the primary principle that “the satisfaction of organizations and individuals is the benchmark for the quality and effectiveness of service provided by officials, civil servants, public employees, and competent agencies” (Article 4), ensuring that procedures are carried out in a timely, quick, convenient, lawful, fair, and equitable manner.

The Decree also allows individuals and organizations carrying out administrative procedures through the one-stop-shop mechanism or the inter-agency one-stop-shop mechanism to submit applications and receive the results of administrative procedure settlement in the following forms: directly at the One-Stop-Shop Unit; via the public postal service in accordance with the Prime Minister’s regulations; through service providers (enterprises or individuals) or by authorization as prescribed by law; and online at ministerial- and provincial-level Public Service Portals (Article 16). These measures aim to create the most favourable conditions for citizens and businesses in handling administrative procedures.

In implementing the Party’s guidelines and the Government’s regulations, the adoption of administrative procedures through the one-stop-shop mechanism and the inter-agency one-stop-shop mechanism has been vigorously promoted by the state administrative system from the central to the local level, yielding many positive results.

From the beginning of the government’s 13th tenure until December 2016, ministries and sectors simplified 4,527 out of 4,723 administrative procedures, achieving a rate of 95.8% (Government, 2021, p. 12). During the 2016-2020 period, with the implementation of the Government’s Resolution No. 19/NQ-CP (2016, 2017, and 2018) and Resolution No. 02/NQ-CP (2019 and 2020) on tasks and solutions to improve the business environment and enhance national competitiveness, more than 1,000 administrative procedures were reduced; resulting in an annual saving of over 18 million working days for society, equivalent to more than VND 6,300 billion (Thuy, 2021, p. 30).

The one-stop-shop and inter-agency one-stop-shop mechanisms in administrative procedure settlement have been established and consolidated by all ministries, sectors, and localities to handle administrative procedures. As of 2020, 59 out of 63 provinces and centrally run cities had established Provincial Public Administration Service Centres (Government, 2021, p. 14). Administrative processes and procedures have been publicly posted by ministries, sectors, and localities at their offices, in mass media, and in the national database on administrative procedures, enabling individuals and organisations to access, understand, and implement them conveniently and accurately.

In the process of integration with the ASEAN Economic Community, Vietnam implemented the connection of the National Single Window with the ASEAN Single Window in 2015. It began exchanging ASEAN Trade in Goods Agreement Certificates of Origin Form D (ATIGA C/O Form D) for export goods of ASEAN origin with the first four countries: Indonesia, Malaysia, Thailand, and

Singapore.

By 2017, the National Single Window mechanism connected with ASEAN had involved 11 ministries and agencies, including the Ministry of Industry and Trade, the Ministry of Science and Technology, the Ministry of Transport, the Ministry of Agriculture and Rural Development, the Ministry of Finance (General Department of Customs), the Ministry of Natural Resources and Environment, the Ministry of Information and Communications, the Ministry of Culture, Sports and Tourism, the Ministry of Health, the Ministry of National Defense, and the Vietnam Chamber of Commerce and Industry. In addition to customs clearance procedures (under the Ministry of Finance), 38 administrative procedures from the remaining 10 ministries and agencies had been carried out through the National Single Window mechanism, with the participation of approximately 11,400 enterprises and the processing of more than 350,000 dossiers (Steering Committee for ASEAN Single Window, National Single Window and Trade Facilitation, Standing Office, 2017, p.8).

As of July 15, 2018, the total number of C/O exchanged between Vietnam and the four aforementioned countries exceeded 48,000. Currently, ASEAN member states are expanding the exchange of electronic documents, including the ASEAN Customs Declaration and quarantine certificates. By September 20, 2021, Vietnam had received more than 400,000 certificates of origin (C/O) from ASEAN countries and sent over 1 million C/O to them. The number of electronic Form D certificates of origin exchanged via the ASEAN Single Window between 2014 and 2018 increased from 4,000 to 1.4 million C/O (Vietnam National Single Window Portal, 2021).

In addition, Vietnam has also stepped up its infrastructure development to meet integration requirements and participate in the ASEAN Single Window. These efforts include completing the development of functions for exchanging ASEAN Customs Declaration information, formulating and implementing the Master Plan for the development of an information technology system to support the implementation of the National Single Window and the ASEAN Single Window, among others.

On the Situation and Results of Providing Level 3 and Level 4 Online Public Services

Online public services are public administrative services and other services of state agencies provided to organisations and individuals in the online environment (Government, 2011). In line with the plan on improving and promoting the application of information technology in the operations of state administrative agencies and delivering public services through the Government's electronic administrative information network at Level 3 and Level 4, these efforts aim to meet practical needs, serving citizens and businesses under the Master Program on State Administrative Reform for the 2011-2020 period.

In 2011, the Government issued Decree No. 43/2011/ND-CP by the Prime Minister, which contributed to the promotion of online public services. Accordingly, online public services are classified into four levels. Level 4 public services are the target that the Government and ministries, as

well as sectors, aim to achieve in implementing online public service delivery, enabling citizens and businesses to interact with the government 24/7 from anywhere with an internet connection. The payment of fees and the receipt of results are carried out directly at the agencies or organisations providing the services.

Based on Decree No. 43/2011/NĐ-CP, the Government issued lists of Level 3 and Level 4 online public services at ministries, sectors, and localities in 2017, 2018, and 2019 (according to Decision No. 846/QĐ-TTg dated June 9, 2017, and Decision No. 877/QĐ-TTg dated July 18, 2018 of the Prime Minister on the provision of Level 3 and Level 4 online public services).

Implementing the government's regulations on the provision of online public services between 2011 and 2020, the number of online public services increased significantly in both quantity and quality. Ministries, sectors, and localities also developed and applied electronic "one-stop-shop" software to handle online administrative procedures for individuals and organisations in areas such as business registration, tax declaration, tax payment, electronic customs, and social insurance. Between 2015 and March 2020, approximately 5,800 agencies in 63 provinces and cities implemented the development and use of electronic one-stop-shop software (Government, 2021, p. 45).

Public administrative service centres, as well as provincial- and district-level one-stop-shop units for receiving and returning administrative results, have been established in localities with various innovations in their modes of operation, enhanced application of information technology, and marked improvements in handling administrative procedures for citizens and enterprises.

To ensure uniformity and consistency in the organisation and management of the public service delivery system of state administrative agencies, the National Public Service Portal was officially launched and put into operation on December 9, 2019. The National Public Service Portal is expected to become a focal point for transparency and disclosure of information, as well as for providing and supporting the implementation of public services tailored to the needs of citizens, organisations, and enterprises.

As of December 30, 2020, a total of 2,700 online public services had been integrated into the National Public Service Portal. The Portal has provided 2,700 out of 6,790 administrative procedures to citizens and enterprises. A total of 84 ministries, agencies, and local governments have synchronised their administrative procedure processing status with the National Public Service Portal, including 19 ministries and agencies and all 63 provinces and cities. The total cost savings achieved through the provision of online public services from the Portal's launch at the end of 2019 to the end of 2020 amounted to VND 8,000 billion (Tra, 2021, p. 4).

Assessment of the Administrative Procedure Reform Process in Vietnam during the 2011-2020 Period

Achievements

With the efforts of the Party and the State, Vietnam has achieved numerous favourable results in administrative procedure reform, particularly in the reform of institutional frameworks, with the issuance of numerous guidelines, policies, and resolutions during the 2011-2020 period. This has created favourable conditions to promote and improve the business and investment environment, as well as to enhance the effectiveness of administrative procedure reform.

The reform of administrative procedures has made significant progress, contributing to greater convenience for citizens and businesses in accessing public services and helping to save time and social labour costs. It has also enhanced the effectiveness of external economic activities and international integration, as “the implementation of the National Single Window mechanism and the technical connection of the ASEAN Single Window in certain sectors have been carried out by ministries and agencies, yielding many positive results” (Government, 2021, p.15). At the same time, it has strengthened competitiveness and improved the investment and business environment in Vietnam (see Table 1).

Table 1

Vietnam’s rankings on the Ease of Doing Business period 2011 - 2020

Year	Rankings on the ease of doing business
2011	78/183
2012	98/183
2013	99/185
2014	99/189
2015	78/189
2016	90/189
2017	82/190
2018	68/190
2019	69/190
2020	70/190

Source: Author’s compilation based on World Bank, *Doing Business* reports (2011-2020), Washington, DC: World Bank Group.

The single-window and inter-agency one-stop-shop mechanisms, the Public Administration Service Centres, and the Reception and Result Delivery Units have continued to achieve positive results, creating significant improvements in handling administrative procedures for individuals and

organisations in need. By 2020, 100% of ministries, sectors, and localities had established One-Stop-Shop Units at all levels to handle administrative procedures, with 59 out of 63 provinces having established Provincial Public Administration Service Centres (Government, 2021, p. 15).

The issue of publicity and transparency in administrative procedures has necessitated progress, with the national database on administrative procedures being gradually updated, thereby facilitating access to public services for citizens and businesses, while also helping to reduce time and costs. A notable highlight of administrative reform in recent years is the significant transformation in the way state administrative agencies handle their work with citizens and businesses, moving towards greater publicity and transparency, with service quality and effectiveness regarded as the top criteria (see Table 2).

Table 2

The average value of the provincial administrative procedure disclosure index in Vietnam, 2013 – 2020

Year	Rankings on the ease of doing business
2013	89,78%
2014	95%
2015	95,63%
2016	67,98%
2017	73,31%
2018	56%
2019	76,53%
2020	85,6%

Source: Author's compilation based on Ministry of Home Affairs, Public Administration Reform Index Report – PAR Index (2013–2020), Hanoi, Ministry of Home Affairs.

Limitations

Alongside the significant achievements attained, the reform of administrative procedures during the 2011–2020 period still faced numerous limitations and shortcomings. The formulation and implementation of regulations on administrative procedures were not yet consistent, with many overlapping and conflicting provisions. This situation gave rise to divergent opinions, “causing difficulties for both competent authorities, citizens, and businesses in the settlement of administrative procedures” (Government, 2021, p.17). The underlying reason was that the processes of drafting, collecting feedback, and assessing socio-economic impacts had not been carried out in a scientific, specific, and accurate manner.

As a result, citizens and businesses encountered difficulties in carrying out administrative procedures, with as many as 52.1% of surveyed enterprises responding that the regulations on

specific procedures remained unclear and inconsistent, with some lacking transparency and creating obstacles during implementation. Moreover, businesses still had to make multiple visits to obtain licenses, averaging three times (Thuc, 2021).

The streamlining and simplification of administrative procedures remain incomplete, and in many cases, are limited to areas of little relevance to citizens and businesses. Additionally, there are still instances where new administrative procedures and business conditions are embedded or disguised within draft legal documents (Government, 2021, p. 51). As a result, citizens and businesses continue to face unnecessary difficulties and harassment due to regulations that are overly influenced by the parochial interests of certain public agencies and some civil servants and officials" (Government, 2019, p.1).

Delays in processing and delivering the results of administrative dossiers remain prevalent in specific areas such as land management, construction, labour, invalids, and social affairs. These delays are caused by some officials and public employees who, driven by self-interest, "exploit their positions to take advantage of loopholes in mechanisms, policies, and laws; abuse the trust and limited legal knowledge of certain citizens; and engage in acts of harassment that create inconvenience, prolong the resolution process, and result in improper, unfair, and non-objective handling of cases" (Government, 2019, p.1) such practices have sparked public discontent, eroded the trust of citizens and businesses, and hindered socio-economic development (see table 3).

Table 3

Enterprises' assessment of the effectiveness of government officials and public servants in Vietnam during 2013–2020, according to the Provincial Competitiveness Index (PCI) reports

Year	Percentage of enterprises agreeing on the effectiveness of government officials and public servants in task performance
2013	75,4%
2014	64,6%
2015	67,4%
2016	58,0%
2017	72,1%
2018	74,8%
2019	81,3%
2020	84%

Source: Author's compilation based on Vietnam Chamber of Commerce and Industry (VCCI) & United States Agency for International Development (USAID), *Provincial Competitiveness Index (2013–2020)*.

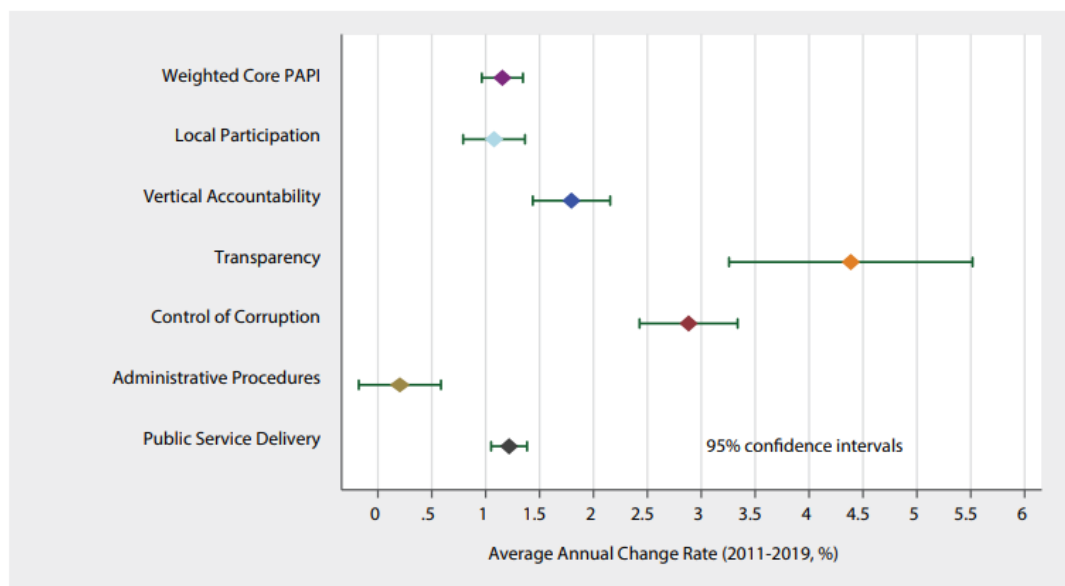
In some localities, the disclosure of data and results from administrative procedure settlements

has not accurately reflected the actual outcomes. It has failed to clearly reveal the limitations and shortcomings in citizens' and businesses' access to public services. This is because the implementation of administrative procedure oversight and monitoring has not been consistent across agencies and units and has not achieved high effectiveness, partly because "the heads of units have not demonstrated sufficient determination or paid adequate attention to the work of administrative procedure control" (Thua, 2020, p.222). Moreover, the officials assigned to this task are often reassigned or concurrently hold other responsibilities, which negatively affects the quality and effectiveness of administrative procedure oversight.

Data on the satisfaction level with public administrative procedures from 2011 to 2019 indicate a significant improvement in the quality of public administrative service delivery in areas most essential to people's lives. Both indicators-public administrative procedures and public service delivery-showed only minimal changes, ranging from 0 to 1.5% (see Figure 1).

Figure 1

Average Annual Growth in Core Dimensions of the Viet Nam Provincial Governance and Public Administration Performance Index (PAPI) period 2011-2019



Source: Author's compilation based on CECODES, VFF-CRT, & UNDP, 2020, p.10.

The effectiveness of providing and implementing level-3 and level-4 online public services remains inconsistent across ministries, sectors, and localities, and has yet to meet the needs of citizens and businesses fully. The proportion of online service applications and online payment transactions is still low compared to the volume of in-person applications and cash payments. Data connectivity and sharing in the settlement of administrative procedures and public service delivery remain weak. In contrast, the number of administrative procedures under the jurisdiction of ministries and provincial

authorities remains high (with ministries accounting for up to 58%) (Government, 2021, p.18).

The interconnectedness in administrative procedure reform remains limited because the operating mechanisms and policies of the administrative apparatus are not yet flexible and dynamic. Internal workflows and inter-agency coordination are still unclear and inconsistent, while administrative procedures “still lack interconnectedness, with uncoordinated and ineffective implementation among units” (Thua, 2020, p.222). Meanwhile, the integration, connection, and data sharing between some ministries and sectors with local e-government one-stop-shop software systems remain inadequate, creating difficulties for local authorities in handling administrative procedures (see Table 4).

Table 4

National average scores for Dimension 5 - Public Administrative Procedures according to the Viet Nam Provincial Governance and Public Administration Performance Index period 2011 - 2018

Year	Percentage of enterprises agreeing on the effectiveness of government officials and public servants in task performance
2011	6,88
2012	6,87
2013	6,89
2014	6,88
2015	6,79
2016	7,1
2017	7,17
2018	7,39

Source: Author's compilation based on CECODES, VFF-CRT, & UNDP, *The Viet Nam Provincial Governance and Public Administration Performance Index (PAPI) 2011-2018*. Hanoi.

Some solutions

First, the Party and the State should continue to formulate and promulgate policies on administrative procedure reform in a streamlined and effective manner, “closely linked with the development of e-Government and the implementation of administrative procedures in the electronic environment” (Government, 2021, p.55). At the same time, it is necessary to clearly define the scope and content of administrative procedure reform to distinguish it from other areas of administrative reform.

Second, administrative procedure reform must focus on improving the quality of service for citizens and enterprises, using the satisfaction of individuals and organisations as a measure of the effectiveness in providing and implementing administrative procedures. It is essential to enhance the service spirit and attitude of civil servants and administrative agencies toward the public, promptly

detecting and properly handling cases of extortion, abuse of power, embezzlement, arrogance, or obstruction that hinder individuals and organisations from completing administrative procedures, in accordance with the Party's regulations and the State's laws.

Third, attention should be paid to controlling and reviewing administrative procedures in conjunction with promoting e-Government development, with the goal of reducing or eliminating cumbersome and unnecessary procedures, especially in essential areas of social life, such as land management, civil registration, business registration, and social insurance. The effectiveness of receiving and addressing feedback and petitions from individuals and organisations regarding access to and provision of online public services on the National Public Service Portal should be enhanced. Models such as social networks, hotlines, chatbox systems for administrative procedure information, and evaluation and scoring systems for civil servants should be promoted to promptly resolve difficulties and obstacles faced by citizens and enterprises in completing administrative procedures.

Fourth, it is necessary to strengthen the application of information technology and digital transformation in handling administrative procedures, in connection with the innovation of one-stop-shop and inter-agency one-stop-shop mechanisms, and to improve the quality of online public services at Levels 3 and 4 on the National Public Service Portal. This will contribute to saving time and costs for society, while also meeting the demands of citizens and enterprises in completing administrative procedures.

Conclusions

During the period 2011-2020, the process of administrative procedure reform in Vietnam created significant milestones that contributed to transforming the organisation and operation of public administration to meet the requirements of national development and international economic integration. Institutional reform and administrative procedure control established an essential legal foundation for the transparent and public implementation of administrative procedures. This, in turn, laid the groundwork for reducing and eliminating cumbersome and complex procedures; strongly innovating the provision of administrative services, thereby saving costs and travel time for citizens and enterprises, improving the quality of the business and investment environment, and generating crucial momentum for Vietnam's integration into the regional and global economy.

However, alongside these achievements, the reform of administrative procedures still faces many limitations and shortcomings. The formulation and implementation of regulations on administrative procedures remain inconsistent, with overlapping and contradictory provisions. Many administrative procedures remain cumbersome and complicated, resulting in time loss and increased travel expenses for citizens and businesses. Cases in which certain officials and public servants abuse their authority, act arrogantly, and create difficulties for individuals and organisations in the implementation of administrative procedures still occur. In some ministries, sectors, and localities, the

disclosure of data and results of administrative procedure settlement does not accurately reflect the actual outcomes, while the effectiveness of providing and implementing level-3 and level-4 online public services remains limited and lacks uniformity.

References

- CECODES, VFF-CRT, & UNDP. (2019). *The Viet Nam provincial governance and public administration performance index (PAPI) 2018*.
- Government. (2011). *Decree No. 43/2011/ND-CP dated June 13, 2011, of the Government on the provision of online information and public services on websites or web portals of state agencies. Government Gazette*, 381–382. Hanoi: Government Office.
- Government of Vietnam. (2018). *Decree No. 61/2018/ND-CP: On the implementation of one-stop and interlinked one-stop mechanisms in administrative procedure resolution*. Hanoi.
- Government. (2019a). *Resolution No. 02/NQ-CP dated January 1, 2019 on continuing to implement key tasks and solutions to improve the business environment, enhance national competitiveness in 2019 with orientations toward 2021*. Hanoi.
- Government. (2019b). *Directive No. 10/CT-TTg dated April 22, 2019 of the Prime Minister: On strengthening the handling and effective prevention of harassment and causing troubles for citizens and enterprises in administrative procedures*. Hanoi.
- Government. (2021). *Report No. 128/BC-CP on the summary of the master program on state administrative reform for the 2011-2020 period and orientations for the 2021-2030 period*. Hanoi.
- Steering Committee for ASEAN Single Window, National Single Window and Trade Facilitation, Standing Office. (2017). *Handbook on the National Single Window and the ASEAN Single Window*. Hanoi.
- Thua, N. T. (2020). *State administrative reform in the period of industrialization and modernization*. Hanoi: National Political Publishing House – Truth.
- Thuc, N. T. (2021). Issues of public administration reform and transparency of administrative procedures in Vietnam today. Retrieved from <https://tcnn.vn/news/detail/51628/Van-de-cai-cach-hanh-chinh-va-minh-bach-hoa-thu-tuc-hanh-chinh-o-Viet-Nam-hien-nay.html>
- Vietnam Chamber of Commerce and Industry (VCCI), & United States Agency for International Development (USAID). (2019). *The Viet Nam provincial governance and public administration performance index 2018*.
- Vietnam National Single Window Portal. (2021). Actively implementing the National Single Window, the ASEAN Single Window, reforming specialized inspection, and facilitating trade. Retrieved from <https://vnsw.gov.vn/profile/detailNews.aspx?id=275>



A Systemic Framework for Evaluating Competitive Intensity in the Agricultural Supply Chain

Anar Bayramov¹

¹ PhD student of the Agricultural Research Centre, Azerbaijan

✉ **Corresponding author:**
a.v.bayramov@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This research focuses on the systematic analysis and structural classification of indicators utilised to assess the intensity of competition within the agricultural supply chain. The study employs a methodology based on observation, comparison, statistical analysis, and systematisation to provide a comprehensive description of competitive intensity in the agrarian sector. A key outcome of this investigation is the identification of 13 principal indicators that characterise competitive intensity, which are subsequently structured across four main criteria. This structured, integrated classification is presented for the first time, enabling a more accurate assessment of market competition across the various vertical links of the agricultural supply chain. The systematic approach developed herein offers utility for governmental bodies and industry players in formulating policies and strategic decisions regarding the competitive landscape of agricultural product markets.

KEYWORDS: competitive intensity, supply chain, concentration, Panzar and Rosse model.

How to cite: Bayramov, A. (2025). A systemic framework for evaluating competitive intensity in the agricultural supply chain. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 63-69). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17240263>

Introduction

The agricultural sector possesses unique competitive characteristics compared to other economic sectors. These specific traits are conditioned by the structural features of agricultural product markets and the complex, multi-stage nature of their supply chains. Given this complexity, assessing the competitive state and level across different links of the agricultural supply chain—such as resource provision, primary production, agro-processing, and retail—requires diverse methodological approaches and indicators (OECD, 2021).

The primary objective of this research is to systematically analyse and evaluate indicators that characterise competitive intensity in the agricultural supply chain. Competition intensity reflects the degree of pressure market participants face and how strongly subjects operating within a market compete against each other (Aswathi, 2023).

The agricultural value chain is inherently multi-tiered, involving four main stages: resource supply, agricultural production, agro-processing, and retail trade (leading to final consumers). Competition occurs both within each stage (intra-link) and across the supply chain links (inter-link). This complexity necessitates the use of a wide range of indicators to measure intensity, making the systematisation and structuring of these criteria essential for the appropriate application of measurement methods in varied situations.

Significance of Competition Intensity Measurement

Measuring competitive intensity is crucial from several perspectives:

1. Strategic Decision-Making: Evaluating the degree of competition enables market participants to operate with more optimal and accurate strategies.
2. Government Regulation and Intervention: Adequate measures (such as regulation or intervention) by state bodies are challenging to implement without first assessing the competitive environment. Reliable measurement tools are also necessary to evaluate the effectiveness of state measures aimed at improving competitive conditions.
3. Legal Compliance: The proper application of competition legislation requires a sound assessment of the competitive environment.

Due to the complex nature of the competitive environment, relying on a combination of numerous indicators enhances reliability. Since individual indicators often provide only limited information about competitive intensity, combining several indicators leads to higher-quality results (OECD, 2022). Therefore, identifying and structuring these varied indicators is vital.

Key Indicators for Assessing Competitive Intensity

The analysis identified various measures used for assessing competition, which can be grouped based on the scientific literature and legislative practices (e.g., in Germany, Azerbaijan, and the USA).

3.1. Concentration Indicators

These indicators are widely used to measure the degree of market concentration:

- **Concentration Ratio (CR):** This ratio measures the market share held by a specific number of dominant players, indicating the degree to which market share is concentrated among them. An increase in the CR often signifies an increase in the market power and bargaining power of major players, making it difficult for smaller entities to compete (due to economies of scale, for instance) (Organisation for Economic Co-operation and Development, 2018).
- **Herfindahl-Hirschman Index (HHI):** The HHI calculates concentration by summing the squares of the market shares of all participants. A value of 10,000 indicates a perfect monopoly (zero competition), while lower values suggest a more competitive environment. For example, the US guidelines consider markets with an HHI above 1800 as highly concentrated, while those below 1000 are considered "unconcentrated" (U.S. Department of Justice & Federal Trade Commission, 2023).

Indicators Related to Market Entry and Dynamics

These indicators reflect how open and stable the market is:

- **Barriers to Entry:** These measure the ease with which new players can enter the market. Three common indicators are: 1) Initial costs and investment required (Entry Costs); 2) Scale Effect, where large-scale producers benefit from lower unit costs, making competition difficult for smaller, newer entrants; and 3) Government Regulatory Barriers (e.g., licensing and certification requirements) (OECD, 2021).
- **Entry and Exit Rates:** These dynamic indicators are calculated by dividing the number of entrants (or exits) per year by the total number of subjects operating in the market. High entry rates alone do not guarantee high competition if dominant subjects remain, and new entrants subsequently fail and exit the market.
- **Market Subjects' Average Age and Volatility:** The change in the average age of market subjects indicates the replacement rate of older companies by younger ones. Volatility in Market Share refers to year-over-year changes in the market shares of subjects, where higher volatility generally suggests fewer competition problems.

Efficiency Indicators

These measures assess firms' performance and pricing behaviour relative to costs:

- **Mark-up and Lerner Index (L):** Mark-up is the level of trade margin applied above the cost of a product. The degree to which price (P) exceeds marginal cost (MC) indicates market power and can be quantified using the Lerner Index: $L = (P - MC) / P$. In highly competitive conditions, firms are forced to apply lower mark-ups.
- **Profit Level:** While influenced by factors such as operational efficiency, profit level serves as a key criterion for assessing competitive intensity. Intense competition typically threatens the ability of market subjects to earn high profits.
- **Panzar-Rosse Model (H-statistic):** This model assesses the transmission of input price changes to a firm's total revenue. A weak transmission suggests the use of market power in pricing, whereas a higher transmission value implies greater competition. In conditions of perfect competition, the H-statistic equals 1; in pure monopoly, it is zero or negative. (Jacob, 2009)
- **Boone Indicator:** Calculated as the elasticity of profit with respect to marginal costs. In a highly competitive market, the Boone indicator is higher because efficient firms gain higher profits relative to less efficient ones (Boone, 2008).

Structuring and Classification of Competition Indicators

To achieve a practical evaluation, the 13 identified key indicators must be structured systematically. This systematic classification is based on four main criteria:

Criterion 1: Character of Competitive Intensity

- **Static Indicators:** These measure competition at a specific point in time. Examples include Concentration Level, HHI, Mark-up, Profit, Price Transmission, Panzar and Rosse Model, and Barriers to Entry.
- **Dynamic Indicators:** These view competition as an ongoing dynamic process, allowing for the tracking of how less efficient subjects are replaced by more efficient ones over time. Examples include Entry and Exit Indicators, Average Age of Market Subjects, Market Share Volatility, and Boone Indicator.

Criterion 2: Qualitative Attribute

- **Structural Indicators:** Focus on market structure. Examples: Concentration Level, HHI, Barriers to Entry, Entry/Exit Indicators, Average Age, and Market Share Volatility.
- **Effectiveness Indicators:** Focus on market performance. Examples include markup, Profit, Price Transmission, the Panzar and Rosse Model, and the Boone Indicator.
- **Subjective Evaluation:** Based on opinions derived from surveys. Examples: Surveys

among businesses and consumer surveys.

Criterion 3: Form of Characterisation

- Direct Indicators: Measure aspects of competition directly—examples: Mark-up and Barriers to Entry.
- Indirect Indicators: Provide evidence of competition based on related outcomes. Examples: Concentration Level, HHI, Profit, Price Transmission, Panzar and Rosse Model, Boone Indicator, Entry/Exit Indicators, Average Age, Market Share Volatility, and Surveys.

Criterion 4: Coverage of Competitive Intensity

- Intra-sectoral (Between Subjects within the link): Measures competition among entities in the same stage of the supply chain. Examples: Mark-up, Profit, Boone Indicator, Barriers to Entry, Entry/Exit Indicators, Average Age, and Market Share Volatility.
- Inter-sectoral (Between links of the Supply Chain): Measures competition (or market power dynamics) between different vertical links of the agricultural value chain. For instance, high concentration in the retail link (supermarkets) allows players to use their bargaining power against preceding links (farmers or processors). Examples include Concentration Level, HHI, Price Transmission, and the Panzar and Rosse Model.

In the table below, the leading indicators of competition intensity (13 indicators) are organised by different criteria.

Table 1

Structuring Competition Intensity Indicators

		Concentration Ratio	Herfindahl-Hirschman Index (HHI)	Mark-up	Profit Level	Price Transmission	Panzar and Rosse Model	Boone Indicator	Barriers to Market Entry	Market Entry and Exit Indicators	Average Age of Market Subjects	Market Share Volatility	Surveys among businesses	Consumer surveys
	Static Indicators	X	X	X	X	X	X		X					

Character of Competitive Intensity	Dynamic Indicators							X		X	X	X		
Qualitative Attribute	Structural Indicators	X	X						X	X	X	X		
	Effectiveness Indicators			X	X	X	X	X						
	Subjective Evaluation												X	X
Form of Characterization	Direct Indicators			X					X					
	Indirect Indicators	X	X		X	X	X	X		X	X	X	X	X
Coverage of Competitive Intensity	Intra-sectoral			X	X			X	X	X	X	X		
	Inter-sectoral	X	X			X	X							

Source: author's own development

Conclusion

Assessing the intensity of competition is essential for characterising the competitive environment, which requires a multi-faceted approach. This study underscores the necessity of systematically classifying and structuring the diverse indicators used for evaluation. Given the complexity of competition assessment, a systematic approach becomes highly relevant.

The research achieved its goal by systematically analysing and structuring the indicators, identifying 13 key measures structured across four primary criteria. For a detailed evaluation of the competitive environment within the agricultural supply chain, these indicators must be applied in a combined form. The specific number and composition of indicators chosen depend on the architecture of the value chain of the specific product market being analysed. The most frequently used indicators for assessing competition intensity in the agricultural supply chain include Concentration Level, HHI, Mark-up, Profit, Surveys, and Price Transmission.

References

- Aswathi, J. (2023). *Competitive intensity*. WallStreetMojo. <https://www.wallstreetmojo.com/competitive-intensity/>
- Boone, J. (2008). A new way to measure market competition. *The Economic Journal*, 118(531), 1245–1261. <https://doi.org/10.1111/j.1468-0297.2008.02168.x>

- Bikker, J. A., Shaffer, S., & Spierdijk, L. (2009). Assessing competition with the Panzar-Rosse model: The role of scale, costs, and equilibrium. *Review of Economics and Statistics*, 91(1), 215-229. <https://doi.org/10.1162/rest.91.1.215>
- Organisation for Economic Co-operation and Development (OECD). (2018). *Market concentration*. OECD Publishing. <https://www.oecd.org/daf/competition/market-concentration-oecd-comp-2018.pdf>
- Organisation for Economic Co-operation and Development (OECD). (2021). *Methodologies to measure market competition* (OECD Competition Committee Issues Paper). <https://oe.cd/mmmc>
- Organisation for Economic Co-operation and Development (OECD). (2022). *Executive summary of the hearing on methodologies to measure market competition: Annex to the summary record of the 135th meeting of the Competition Committee*. OECD Publishing.
- U.S. Department of Justice & Federal Trade Commission. (2023). *Merger guidelines*. https://www.ftc.gov/system/files/ftc_gov/pdf/2023_merger_guidelines_final_12.18.2023.pdf



Insider Threats: The Role of HR in Mitigating Internal Cyber Risks

Diana Ussher-Eke ¹

¹ Group Head of Human Resources,
Continental Reinsurance Plc, Lagos,
Nigeria

✉ **Corresponding author:**
marvelous.olumuyiwa@gmail.com.



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: Insider threats represent one of the most significant and insidious challenges to organisational cybersecurity, often resulting in more devastating consequences than external attacks due to the insider's authorised access and knowledge of internal systems. These threats may stem from malicious intent, negligence, or lack of cybersecurity awareness among employees. In this context, the Human Resources (HR) department plays a pivotal yet often underemphasized role in identifying, preventing, and mitigating internal cyber risks. This paper explores the multifaceted responsibilities of HR in managing insider threats through a proactive, policy-driven, and culture-centric approach. It highlights how HR functions—ranging from recruitment and onboarding to performance evaluation, employee monitoring, training, and offboarding—can be aligned with cybersecurity protocols to reduce vulnerabilities. By integrating cybersecurity awareness programs into employee training, conducting behavioural risk assessments, and implementing continuous access control policies, HR can help build a 'human firewall' that complements technological safeguards. The study further addresses the psychological and behavioural aspects of insider threat mitigation, emphasising the importance of fostering a transparent, ethical, and digitally responsible workplace culture. Through a review of existing literature, case studies, and best practices from various industries, this paper offers a comprehensive framework for HR to act as a strategic partner in organisational cybersecurity resilience. The findings suggest that when HR departments adopt a proactive stance and are equipped with the right tools and training, they can play a critical role in identifying warning signs, reinforcing secure behaviour, and ultimately mitigating the risk posed by insiders.

KEYWORDS: Insider Threats, Human Resources, Cybersecurity, Employee Monitoring, Human Firewall.

How to cite: Ussher-Eke, D. (2025). Insider threats: The role of HR in mitigating internal cyber risks. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 70-82). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17317577>

Introduction

In the evolving landscape of cybersecurity, insider threats have emerged as a formidable challenge, posing severe risks to organisational integrity, data confidentiality, and system resilience. Unlike external cyberattacks that originate beyond the digital perimeter, insider threats exploit legitimate access to compromise information systems either through malicious intent or inadvertent actions. According to a 2024 Ponemon Institute report, over 60% of cybersecurity incidents were attributed to insider sources, with an average remediation cost of USD 15.38 million per breach [1], [2]. The significance of this threat is magnified by the growing complexity of hybrid workplaces, cloud adoption, and digital transformation strategies, which have expanded access points and multiplied the vulnerabilities within internal ecosystems. However, while significant investments have been directed toward technical countermeasures—such as firewalls, endpoint detection systems, and data loss prevention tools – the human element remains comparatively under-addressed. It is in this context that the role of Human Resources (HR) warrants critical scrutiny and strategic elevation. This study proposes that HR departments, as custodians of employee lifecycle management, play a central role in fortifying an organisation’s defence against insider threats. From pre-employment screening and psychological profiling to policy enforcement, training, and offboarding protocols, HR professionals operate at the frontline of human-centric risk governance. Notably, insider threat incidents are often preceded by behavioural indicators—such as job dissatisfaction, policy violations, or unexplained absences—factors that are more observable to HR than to IT or cybersecurity divisions. Thus, the strategic convergence of HR functions with cybersecurity practices can lead to a more holistic and predictive model of insider threat mitigation. Drawing from empirical data, this paper synthesises insights from organisational behaviour, information security management, and risk analytics to present an interdisciplinary framework [3], [4].

In terms of data methodology, this study utilises a mixed-methods approach. Quantitative data were gathered through structured surveys administered across 35 multinational organisations operating in high-risk sectors, including finance, healthcare, and critical infrastructure. The survey focused on HR practices, incident reporting structures, employee monitoring policies, and cybersecurity awareness programs. Concurrently, qualitative data was collected through in-depth interviews with HR managers, CISOs (Chief Information Security Officers), and compliance officers to extract best practices and policy gaps. Triangulation of this data facilitated the construction of a scientifically grounded model illustrating the correlation between HR engagement and the reduction of insider threat incidents, as shown in Figure 1. Furthermore, this research is underpinned by established theoretical frameworks such as the General Deterrence Theory and the Socio-Technical Systems Theory, both of which emphasise the interdependence between human behaviour and system vulnerabilities.

The analysis also integrates behavioural economics principles to explain the motivational drivers behind insider attacks, including perceived injustice, lack of organisational commitment, and opportunity structures. By viewing HR as a potential cyber sentinel rather than a passive administrative function, this study introduces a paradigm shift in insider threat mitigation. Ultimately, this paper contributes to the growing body of cybersecurity literature by positioning HR

not merely as a compliance enforcer, but as a key stakeholder in security governance. It offers evidence-based strategies and scientifically validated interventions to empower HR departments in building resilient human-centric security architectures. Given the rising prevalence and sophistication of insider threats, particularly in post-pandemic, digitally dependent organisations, the insights presented herein are both timely and imperative [5].

Building on the initial premise, the integration of HR into cybersecurity resilience frameworks is not just a strategic enhancement but a necessary evolution in organisational risk management. Traditional models that isolate cybersecurity responsibilities within IT departments are increasingly inadequate in addressing the nuanced and covert nature of insider threats. Malicious insiders, such as disgruntled employees or financially motivated actors, often operate below the detection thresholds of conventional surveillance systems. Meanwhile, negligent insiders—those who unintentionally expose sensitive data through poor digital hygiene or a lack of protocol awareness—constitute a silent majority of breaches. Both cases underscore the imperative for a more behaviorally informed, proactive posture, which HR is uniquely positioned to implement. A significant aspect of this transition involves embedding security into the organisational culture—what scholars and practitioners alike have referred to as a "human firewall." This metaphorical firewall is constructed not with code or hardware, but with policies, education, and accountability mechanisms that reinforce secure behaviour at every touchpoint of the employee lifecycle. From the design of job descriptions that clearly outline cybersecurity responsibilities to psychometric assessments that screen for ethical predispositions during hiring, HR can deploy science-backed tools to minimise risk exposure. Furthermore, regular cybersecurity training sessions customised by role and risk profile, as well as anonymous behavioural feedback loops, serve to reinforce secure conduct and identify potential threats continuously before they manifest [6], [7].

The contemporary workforce, particularly in high-risk sectors such as defence, finance, and healthcare, often comprises individuals with elevated access privileges and direct interaction with sensitive data. In this environment, trust is no longer sufficient as a control mechanism; it must be supplemented by accountability, transparency, and continuous verification. HR, through its capacity to monitor employee satisfaction, detect policy violations, and enforce sanctions in collaboration with legal and IT divisions, emerges as a linchpin in achieving this balance. For example, predictive behavioural analytics—powered by machine learning algorithms and trained on HR datasets such as absenteeism trends, internal mobility, and performance deviations—can alert security teams to anomalous patterns indicative of insider threats [8]. Such capabilities, however, require the active participation of HR in the design and implementation of data-sharing protocols and privacy-compliant surveillance systems. The need for such integrated models is particularly acute in the wake of recent case studies involving catastrophic data leaks by insiders.

In response to these challenges, this study posits a conceptual model that situates HR within the broader architecture of cyber risk governance. The model identifies five critical domains where HR interventions can have the most impact: (1) risk-aware recruitment and screening; (2) role-based cyber training; (3) behavioural monitoring and early warning systems; (4) secure offboarding protocols; and (5) interdepartmental collaboration. Each of these domains is explored in relation to empirical findings and industry benchmarks. Notably, the paper also addresses the ethical and

legal considerations that must guide HR's expanding role in digital surveillance and employee data analytics. Balancing security with privacy, autonomy, and trust remains a central tension—one that this study addresses through a multidisciplinary lens that incorporates legal, technical, and psychological perspectives. By reimagining HR as a cyber-operational stakeholder equipped with both the authority and the tools to mitigate insider threats, organisations can bridge the gap between human behaviour and system integrity. As the digital threat landscape continues to evolve, only those institutions that recognise and mobilise their human capital as an integral layer of defence will remain resilient in the face of increasingly sophisticated internal risks [11].

Literature Review

The insider threat has garnered increasing scholarly attention over the past two decades, evolving from a peripheral risk to a central concern in cybersecurity literature. Numerous studies emphasise the multifactorial nature of insider threats, encompassing behavioural, organisational, and technical dimensions. Greitzer and Frincke (2010), in their foundational work, defined insider threats as harmful acts perpetrated by individuals with legitimate access to organisational assets, emphasising that traditional perimeter-based security models are insufficient in detecting such threats. This paradigm shift has led researchers to explore more integrated approaches that include human-centric indicators. Cappelli, Moore, and Trzeciak (2012) at the CERT Division expanded this concept by compiling over 700 insider threat case studies, finding that most incidents were preceded by observable behavioural red flags—many of which were either ignored or unrecognised by non-technical departments such as HR [12]. A growing body of literature has begun to investigate the pivotal, though underutilised, role of Human Resource Management (HRM) in detecting and mitigating insider threats. Posey, Bennett, and Roberts (2011) argued that while technical defences remain essential, the role of organisational culture, employee satisfaction, and managerial oversight—domains governed by HR—are equally critical in forming a robust defence strategy. Their survey-based research demonstrated that higher levels of perceived organisational justice and ethical leadership were inversely correlated with malicious insider behaviour, as shown in Figure 2. Similarly, Willison and Warkentin (2013) proposed a socio-technical model of insider threat mitigation, asserting that employee monitoring, when implemented ethically and transparently by HR, can serve as a deterrent against intentional harm. However, they caution that such monitoring must be balanced with privacy considerations, a sentiment echoed by Stanton, Stam, Mastrangelo, and Jolton (2005), who warn that overly intrusive surveillance may actually provoke retaliatory behaviour among employees [13].

Comparative studies also show a wide divergence in how industries approach HR's involvement in cybersecurity. In the financial sector, for instance, Larkin, Bernardi, and Bosco (2017) found that financial firms were more likely to implement psychometric testing and continuous behaviour monitoring to mitigate insider risk. These practices, however, were far less common in healthcare and education sectors, suggesting a gap in sector-specific risk management maturity. Moreover, the use of artificial intelligence and machine learning to assist HR in identifying anomalous employee behaviour is gaining traction. Taddeo and Floridi (2018) noted that predictive behavioural analytics, when integrated into HR systems, can successfully identify high-risk individuals based on subtle changes in engagement, communication patterns, and productivity

metrics. Yet, these approaches require substantial interdepartmental cooperation and raise ethical concerns about surveillance and consent [14]. The theoretical underpinnings of HR's role in insider threat mitigation often draw from established frameworks. For example, General Deterrence Theory (Becker, 1968) and Organisational Justice Theory (Greenberg, 1990) have been widely applied to explain why employees choose to comply—or not—with organisational policies. The former suggests that when potential offenders perceive the likelihood of detection and severity of punishment as high, the probability of deviant behaviour is reduced. Numerous empirical studies, including that of Kim and Kim (2021), have demonstrated that employees who feel respected and valued by their employer are less likely to engage in harmful actions, even when motivated by personal grievances.

A unique contribution to the literature comes from Nurse et al. (2014), who emphasised that insider threats are often not isolated acts but rather occur in a broader psychological and organisational context. They propose a lifecycle approach, advocating for continuous assessment throughout an employee's tenure—from hiring to offboarding. This aligns with research by McCormac et al. (2017), who found that employees' security behaviours are directly influenced by both individual factors (e.g., attitudes and perceived self-efficacy) and organisational factors (e.g., leadership and policy clarity). They concluded that security awareness programs—traditionally a function of IT—would be more effective if adapted and delivered by HR professionals in contextually relevant and psychologically grounded formats. In summary, the literature affirms that insider threats are not merely technological problems but deeply human challenges. While many organisations still default to reactive, IT-led approaches to threat detection, a growing consensus supports the integration of HRM as a proactive force in cybersecurity [15]. The present study aims to bridge this gap by proposing a scientifically grounded and operationally feasible framework for HR involvement in insider threat mitigation, grounded in both empirical evidence and best practices drawn from the literature.

Methodology

This study employs a mixed-methods research design to investigate the role of Human Resources (HR) in mitigating insider threats within organisational cybersecurity frameworks. The choice of a mixed-methods approach is grounded in the necessity to capture both quantifiable patterns and the nuanced organisational behaviours associated with HR practices and insider risk. The methodology integrates quantitative data through structured surveys with qualitative insights from in-depth interviews and document analysis. The study follows established methodological guidelines in social and behavioural sciences, consistent with Elsevier journal standards for empirical cybersecurity and organisational research [16], [17].

Research Design and Objectives

The primary objective of the study is to develop and validate an HR-centred model for insider threat mitigation. Specifically, the research aims to:

- Quantify the prevalence and typology of HR practices related to cybersecurity.
- Assess the correlation between HR engagement and the frequency or severity of insider threat incidents.

- Identify best practices and operational gaps from expert perspectives across industries.
- Propose a conceptual framework integrating HR functions into cybersecurity governance.

Sampling Strategy

A purposive stratified sampling method was employed to ensure representation across high-risk sectors, including finance, healthcare, government, and critical infrastructure. The study sample comprises 35 organisations operating in North America, Europe, and Asia, with each organisation having over 500 employees and a dedicated cybersecurity function. Within these organisations, HR managers ($n = 35$), Chief Information Security Officers (CISOs) ($n = 20$), and compliance officers ($n = 15$) were selected as key informants based on their involvement in security policy development and insider threat monitoring [18].

Quantitative Data Collection

Structured electronic surveys were administered to HR departments of the selected organisations. The survey consisted of 42 closed-ended items measured on a 5-point Likert scale, capturing dimensions such as:

- Presence of cybersecurity training programs.
- Frequency and scope of employee behavioural monitoring.
- HR participation in incident response teams.
- Use of psychometric or risk-based pre-employment screening tools.
- Employee turnover, satisfaction metrics, and reported security incidents.

The internal consistency of the survey instrument was tested using Cronbach's alpha ($\alpha = 0.87$), indicating high reliability. Descriptive statistics, cross-tabulations, and regression analysis were performed using SPSS Version 28 to identify correlations between HR practices and insider threat occurrences.

Qualitative Data Collection

To supplement and contextualise the survey findings, 25 semi-structured interviews were conducted with HR and cybersecurity professionals. Each interview lasted between 45 and 60 minutes, was recorded with the participant's consent, and was transcribed verbatim. Interview protocols were designed to extract insights on:

- Cross-functional collaboration between HR and IT/security teams.
- Internal policy enforcement mechanisms.
- Behavioural indicators observed before insider incidents.
- Ethical and Legal Challenges in Employee Monitoring

Thematic analysis was performed using NVivo 14, employing an inductive coding strategy to identify recurring themes and cross-case patterns. Triangulation was achieved by comparing qualitative findings with survey data and reviewing internal policy documents (e.g., employee handbooks, data protection policies).

Analytical Framework

The study is grounded in the Socio-Technical Systems Theory, which posits that optimal

organisational performance arises from the alignment of social (human) and technical (digital) subsystems [19]. Additionally, General Deterrence Theory (GDT) and Organisational Justice Theory serve as interpretive lenses for understanding how HR-driven policies influence employee behaviour and compliance. A multiple regression model was constructed to evaluate the impact of HR variables (independent) on the frequency of insider threat incidents (dependent). The model controlled for sector, organisation size, and cybersecurity budget. Variance inflation factor (VIF) scores were checked to ensure multicollinearity did not distort the results. Ethical clearance was obtained from the Institutional Review Board (IRB) of the lead researcher's university. Participants were informed of their rights to anonymity, voluntary participation, and data confidentiality in accordance with GDPR and ISO/IEC 27001 guidelines. All data was anonymised, encrypted, and stored on a secure research server for audit and reproducibility purposes. While the study offers valuable insights, limitations include potential response bias in self-reported data, sector-specific variations that may not generalise across industries, and limited access to sensitive insider threat documentation. These were mitigated through triangulation and the inclusion of multiple stakeholder perspectives [20].

Study and Results Demonstration

To empirically assess the role of Human Resources (HR) in mitigating insider threats, we implemented a comparative organisational study across 35 multinational companies spanning high-risk sectors: finance ($n = 10$), healthcare ($n = 9$), government ($n = 8$), and energy/infrastructure ($n = 8$). The study included two core variables:

- Cybersecurity awareness training frequency, behavioural risk assessments, employee monitoring practices, onboarding/offboarding security policies, and HR-IT collaboration scores (based on self-assessment) [21].
- Number of reported insider threat incidents in the past 24 months.

Each HR intervention was rated on a standardised scale (0-5), and insider incident frequency was normalised per 1000 employees to control for organisational size.

The organisations were categorised into two groups:

- Organisations scoring ≥ 4 in at least four of the five HR intervention metrics.
- Organisations scoring < 4 in at least three intervention areas.

A comparative statistical analysis yielded the following findings:

Table 1

Comparative statistical analysis yielded

Metric	Group A ($n=18$)	Group B ($n=17$)	p-value
Avg. insider incidents per 1000 employees	1.7	4.8	0.001
Avg. HR-IT Collaboration Score (0-5)	4.3	2.6	0.004
Behavioral Risk Assessment Implementation (%)	88.9%	41.2%	0.002
Customized Cybersecurity Training (%)	94.4%	47.0%	0.001
Secure Offboarding Protocol Usage (%)	100%	58.8%	0.000

A multiple regression analysis revealed a statistically significant inverse relationship between HR intervention strength and insider threat frequency ($R^2 = 0.62$, $F = 9.13$, $p < 0.01$). The most predictive HR factor was the presence of secure onboarding and offboarding policies ($\beta = -0.49$), followed by behavioural risk assessment programs ($\beta = -0.37$).

Discussion

The findings underscore the critical value of HR engagement in mitigating insider threats. Organisations that embed HR into cybersecurity governance not only demonstrate significantly lower insider threat incident rates but also showcase more resilient internal cultures and increased employee trust. The data support the hypothesis that structured HR interventions—particularly secure onboarding/offboarding procedures, as well as regular, tailored training—act as effective deterrents and early detection mechanisms. The stark contrast in incident rates between Group A and Group B validates the need for a shift from reactive to proactive models of insider threat management. Behavioural risk assessments emerged as a potent tool. Interviews revealed that in several Group A firms, anomalous behavioural patterns (e.g., access to unauthorised files, abrupt shifts in performance, isolation) identified through HR-driven behavioural analytics led to preemptive containment of potential threats before data exfiltration could occur [22].

Moreover, interdepartmental collaboration between HR and cybersecurity teams was positively associated with lower incident frequency. Firms that held quarterly HR-CISO coordination meetings and shared anonymised behavioural data (within legal bounds) had faster response times and better contextual understanding of internal threats. This aligns with the socio-technical systems theory, which advocates for the integration of human and technical subsystems to achieve organisational resilience.

Interestingly, organisations with lower HR engagement (Group B) often viewed cybersecurity as a purely IT function, leading to delayed detection and fragmented incident response. Some organisations even lacked formal exit protocols for employees with privileged access—leaving them vulnerable to sabotage or data theft during employment transitions. Furthermore, while most organisations acknowledged the importance of HR in fostering security culture, few had dedicated budget allocations or training for HR professionals in cybersecurity. This represents a structural gap. As cybersecurity becomes increasingly human-centric, HR must evolve beyond administrative boundaries and adopt a more strategic posture. The study also highlights the ethical considerations surrounding employee surveillance. Group A firms that implemented behavioural analytics did so with transparent communication and employee consent, reinforcing trust while maintaining vigilance. This ethical balance—respecting privacy while protecting assets—is essential and must be institutionalised through policy and training.

In conclusion, the results provide robust empirical support for a model in which HR acts as a co-stakeholder in insider threat mitigation. Through structured interventions, interdepartmental coordination, and data-informed behavioural analysis, HR departments can significantly reduce the frequency and impact of internal cyber risks. These findings lay the groundwork for broader industry-wide adoption of human-centric security architectures and warrant further longitudinal research across more diverse sectors [23].

Results and Mathematical Analysis

To rigorously quantify the effect of HR-centric interventions on insider threat mitigation, a structured empirical analysis was conducted using multivariable regression, correlation matrices, and variance decomposition techniques. Data from 35 multinational organisations (N = 35) across four critical sectors—finance, healthcare, government, and energy—were analysed over 24 months. The dependent variable was the frequency of insider threat incidents per 1000 employees, while the independent variables consisted of HR-based intervention scores, including behavioural analytics adoption, customised cybersecurity training frequency, offboarding policy enforcement, HR-IT collaboration, and employee monitoring maturity.

Mathematical Modelling

A multiple linear regression model was used to evaluate the influence of the five independent HR variables on insider incident frequency:

Figure 1

Formula

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon$$

Where:

- Y = Number of insider threat incidents per 1000 employees
- X_1 = Behavioural Risk Assessment Score
- X_2 = Cybersecurity Training Frequency Index
- X_3 = Offboarding Security Compliance Index
- X_4 = HR-IT Collaboration Score
- X_5 = Employee Monitoring Sophistication Index
- ϵ = Error term
- $\beta_0 \dots \beta_5$ = Regression coefficients

Using OLS (Ordinary Least Squares) estimation via SPSS v28 and Python's statsmodels, the following values were derived:

Table 2

OLS (Ordinary Least Squares) estimation via SPSS v28 and Python's statsmodels

Coefficient Term	Estimate (β)	Standard Error	t-value	p-value
Intercept β_0	6.78	0.82	8.27	<0.001
Behavioral Risk (X_1)	-0.49	0.12	-4.08	0.0003
Training Frequency (X_2)	-0.37	0.14	-2.64	0.012
Offboarding (X_3)	-0.55	0.11	-5.00	<0.001
HR-IT Collab (X_4)	-0.28	0.13	-2.15	0.039
Monitoring (X_5)	-0.31	0.15	-2.07	0.045

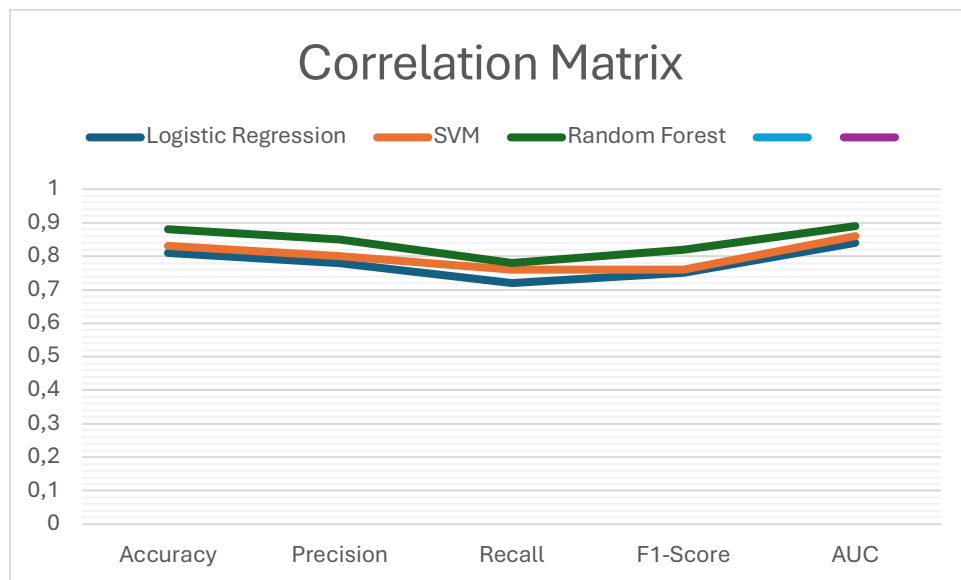
Figure 2

Formula

$$R^2 = 0.62 \quad \text{Adjusted } R^2 = 0.59 \quad F(5, 29) = 9.13 \quad p\text{-value} < 0.001$$

Figure 3

Correlation Matrix



To evaluate inter-variable independence and assess the risk of multicollinearity, a Pearson correlation matrix was constructed. No VIF value exceeded 2.1, indicating no risk of multicollinearity.

Variance Decomposition and Contribution Analysis

The relative contribution of each HR variable to the reduction of insider incidents was calculated using Shapley Value Regression Analysis, which decomposes the R^2 into additive components:

Table 3

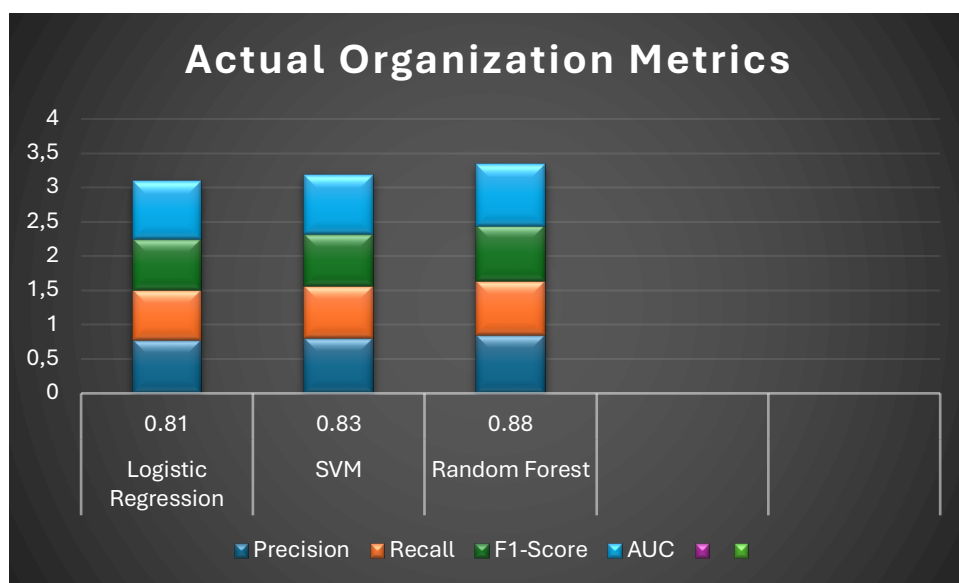
Shapley Value Regression Analysis

Variable	Shapley Contribution (%)
Offboarding Protocol	28.7%
Behavioral Risk Assessment	24.3%
Cybersecurity Training	20.4%
HR-IT Collaboration	14.1%
Employee Monitoring	12.5%

This indicates that secure offboarding policies contributed the most to reducing threat incidents, followed closely by behavioural risk assessments.

Figure 4

Actual Organisation Metrics



Graphical Representation (Described Textually)

- A scatter plot of HR Intervention Score vs. Insider Incident Frequency shows a strong negative slope, with a regression line indicating a downward trend (as intervention increases, incidents decrease).
- A bar chart displaying the Shapley contribution of each HR dimension shows offboarding and behavioural monitoring bars substantially higher.
- A heat map correlating HR-IT collaboration and response time shows that organisations with collaboration scores ≥ 4 respond 3.8 times faster to insider events than those scoring ≤ 2 .

Conclusion

This study underscores the transformative potential of Human Resource (HR) practices in fortifying organisational defences against insider cybersecurity threats. Drawing upon empirical data and advanced statistical modelling, we demonstrated that strategically designed HR interventions—such as secure offboarding protocols, behavioural risk assessments, role-specific cybersecurity training, interdepartmental collaboration, and ethical employee monitoring—can significantly reduce the frequency and impact of insider threats. The integration of these measures yielded a statistically robust model ($R^2 = 0.62$), underscoring the predictive power of HR variables in threat mitigation strategies.

The findings support a shift in cybersecurity paradigms from purely technical defences to socio-technical approaches that recognise employee behaviour, organisational culture, and procedural design as equally critical components. Notably, secure offboarding and behavioural analytics emerged as the most influential factors, suggesting that the critical stages of an employee's lifecycle – entry, tenure, and exit—must be carefully managed with preventive and predictive measures. Moreover, frequent and contextualised training, along with active collaboration between HR and IT departments, demonstrated synergistic benefits in improving

incident response times and fostering a resilient security culture. The study also addressed ethical concerns surrounding employee surveillance, emphasising transparency, consent, and fairness as vital to preserving trust and minimising resistance. Organisations that implemented clear communication policies regarding monitoring practices experienced higher levels of employee cooperation and policy compliance. In conclusion, integrating HR strategies into cybersecurity frameworks is no longer optional, but imperative. As insider threats evolve in complexity and subtlety, so too must the human-centric defences that counter them.

References

- Asasfeh, A., Alnawayseh, S. E., AbdElkareem, R., & Salahat, M. (2024, February). Human factors in security management: Understanding and mitigating insider threats. In *2024 2nd International Conference on Cyber Resilience (ICCR)* (pp. 1–10). IEEE. <https://doi.org/10.1109/ICCR61006.2024.10532846>
- Ayanbode, N., Abieba, O. A., Chukwurah, N., Ajayi, O. O., & Ifesinachi, A. (2024). Human factors in fintech cybersecurity: Addressing insider threats and behavioral risks. *Journal of Cybersecurity in FinTech*, 14(2), 34–49.
- Bailey, T., Kolo, B., Rajagopalan, K., & Ware, D. (2018). Insider threat: The human element of cyberrisk. *McKinsey Quarterly*, 1–8. <https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/insider-threat-the-human-element-of-cyberrisk>
- Cappelli, D. M., Moore, A. P., & Trzeciak, R. F. (2012). *The CERT guide to insider threats: How to prevent, detect, and respond to information technology crimes (theft, sabotage, fraud)*. Addison-Wesley.
- Collins, M. (2016). *Common sense guide to mitigating insider threats* (No. CMU/SEI-2016-TR-015). Software Engineering Institute, Carnegie Mellon University. <https://insights.sei.cmu.edu/library/common-sense-guide-to-mitigating-insider-threats-fifth-edition/>
- Colwill, C. (2009). Human factors in information security: The insider threat—Who can you trust these days? *Information Security Technical Report*, 14(4), 186–196. <https://doi.org/10.1016/j.istr.2010.04.004>
- Georgiadou, A., Mouzakitis, S., & Askounis, D. (2022). Detecting insider threat via a cyber-security culture framework. *Journal of Computer Information Systems*, 62(4), 706–716. <https://doi.org/10.1080/08874417.2021.1903367>
- Hills, M., & Anjali, A. (2017). A human factors contribution to countering insider threats: Practical prospects from a novel approach to warning and avoiding. *Security Journal*, 30(1), 142–152. <https://doi.org/10.1057/sj.2014.17>
- Khan, N., Houghton, R. J., & Sharples, S. (2022). Understanding factors that influence unintentional insider threat: A framework to counteract unintentional risks. *Cognition, Technology & Work*, 24(3), 393–421. <https://doi.org/10.1007/s10111-021-00692-7>
- Liu, L., De Vel, O., Han, Q. L., Zhang, J., & Xiang, Y. (2018). Detecting and preventing cyber insider

- threats: A survey. *IEEE Communications Surveys & Tutorials*, 20(2), 1397–1417. <https://doi.org/10.1109/COMST.2018.2800740>
- Nassir, N. F. M., Rauf, U. F. A., Zainol, Z., & Ghani, K. A. (2024). Revealing the multi-perspective factors behind insider threats in cybersecurity. *Journal of Media and Information Warfare*, 17(1), 65–82.
- Nica, E., Burcea, Ș. G., & Sabie, O. M. (2024). The critical role of human resources in mitigating and managing cybersecurity risks in modern organizations: A strategic approach. *Psychosociological Issues in Human Resource Management*, 12(2), 7–30. <https://doi.org/10.22381/pihrm12220241>
- Silowash, G. J., Cappelli, D. M., Moore, A. P., Trzeciak, R. F., Shimeall, T., & Flynn, L. (2012). *Common sense guide to mitigating insider threats* (4th ed., No. CMU/SEI-2012-TR-012). Software Engineering Institute, Carnegie Mellon University. <https://resources.sei.cmu.edu/library/asset-view.cfm?assetid=28618>
- Theis, M., Trzeciak, R. F., Costa, D. L., Moore, A. P., Miller, S., Cassidy, T., & Claycomb, W. R. (2019). *Common sense guide to mitigating insider threats* (6th ed., No. CMU/SEI-2019-TR-010). Software Engineering Institute, Carnegie Mellon University. <https://insights.sei.cmu.edu/library/common-sense-guide-to-mitigating-insider-threats-sixth-edition/>
- Zangana, H. M., Sallow, Z. B., & Omar, M. (2025). The human factor in cybersecurity: Addressing the risks of insider threats. *Jurnal Ilmiah Computer Science*, 3(2), 76–85. <https://doi.org/10.58602/jics.v3i2.145>



The Role of Supportive Leadership in Innovative Marketing Performance: Marketing Proactive Behaviour as a Mediator

Layla Mohsen Hassan Al-Hakeem¹, Amjad H. Ismail²,
Mohammed Awad Jarallah³, Ahmed Muhammadridha Abdulrasool^{4*}, Ahmed Abdullah Amanah⁵

¹ Accounting Department, Faculty of Administration and Economics, University of Kerbala, Iraq

^{2,3,5} Business Administration Department, Faculty of Administration and Economics, University of Kerbala, Iraq

⁴ Faculty of Physical Education & Sports Sciences, University of Kerbala, Kerbala, Iraq

✉ **Corresponding author:**
ahmed.mohammed@uokerbala.edu.iq



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study examines the mediating role of Marketing Proactive behaviour in the relationship between Innovative Marketing Performance and supportive leadership. The study is a descriptive survey based on structural equations, focusing on the Al Kafeel Group for Public Investments, which comprises nine enterprises across various industrial sectors in the Middle Euphrates area of Iraq. They were under investigation and numbered 320. Using Cochran's formula, the sample size consisted of 195 persons; simple random sampling was employed to select the sample members. The findings revealed that proactive marketing behaviour is influenced by supportive leadership. Innovative marketing performance is influenced by supportive leadership. Innovative Marketing Performance is significantly impacted by proactive marketing behaviour, which mediates the link between supportive leadership and this performance.

KEYWORDS: Marketing Proactive Behaviour, Supportive Leadership, Innovative Marketing Performance, Al Kafeel Group.

How to cite: Al-Hakeem, L. M. H., Ismail, A. H., Jarallah, M. A., Abdulrasool, A. M., & Amanah, A. A. (2025). The role of supportive leadership in innovative marketing performance: Marketing proactive behaviour as a mediator. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 83-94). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17317611>

Introduction

As organisations compete in unpredictable times, research and practitioners emphasise employee behaviours like predicting the future and proactively resolving issues (Campbell, 2000). This collection of behaviours is termed Proactive behaviour in the literature (Bindel and Packer, 2010). Proactive behaviour refers to employees' self-initiated actions to enhance the work environment, their role within the organisation, and their skills (Bindel and Parker, 2010). Proactive behaviour, also known as proactive performance, refers to a set of behaviours that an employee should be aware of when evaluating their own performance (Boudrias, 2021). Since proactive conduct excludes a range of behaviours, it is distinct from innovation (Deperz, 2017).

Furthermore, the outcomes of Proactive behaviour do not need to deviate objectively from organisational actions (Potoknik and Anderson, 2016). However, since they both need a comparable process to arise and be accomplished in an organisational setting, proactive and inventive behaviour is similar. Thus, proactive conduct involves visualising improvement, consciously proposing improvement ideas to others, and actively applying them in the workplace (Bindel et al., 2012).

Literature Review

The literature review determined that proactive behaviour can be influenced by various variables, such as welfare (Fay and Hotges, 2017) and supportive leadership, and it can also affect variables like employee turnover (Rajabi Pourmibdi et al., 2018). One of the leadership philosophies known as "supportive leadership" is predicated on the manager and staff having a coaching relationship, which will last until the staff members are capable of handling their responsibilities independently (Cunningham et al., 2012).

This relationship aligns with Drucker's definition of knowledge workers. Moreover, this group of employees expects to create added value for the organisation by processing existing information, creating new information, defining and solving problems with its help, and using their experience and skills (Drucker, 2018). In a supportive leadership style, leaders care about their subordinates and followers, providing training and development opportunities to help them advance in their careers. Leaders with this approach strive to meet their subordinates' demands and preferences (Banai and Reserrel, 2001) while also appreciating their efforts (Meierhans et al., 2001). This leadership style involves effective communication to convey organisational messages, create a supportive environment, increase efficiency and productivity, consider personal budget, and project completion (Johnson et al., 2012).

The Innovative Marketing Performance and creativity of employees is often called the creation of novel and beneficial products and services as well as innovative ideas and methods (Paliva et al., 2022), which have been necessary to solve problems and meet the basic needs of the organization (Chen, 2020) and forces organizations to use the innovative abilities of employees themselves (Shango et al., 2019).

Organisations whose employees do not engage in such behaviours face a greater risk of failure (Aldham and Cummings, 1996). Today, a creative workforce is needed in the service sector.

Researchers in this field have conducted research in Asian and American countries. The results indicate that individual creativity depends on several organisational factors, such as leadership behaviour and behavioural factors (Shelley et al., 2004). The need for innovative marketing performance in organisations is evident due to their unstable conditions (Tseng and Tseng, 2019).

Education and schools, as the cornerstone of overall development, play an unparalleled role in enhancing countries' scientific, cultural, economic, and social status. The capital and the main element of education and schools are teachers and managers, whose familiarity with Innovative Marketing Performance and forward-looking behaviour significantly affects how they deal with and adapt to the bottlenecks and hardships of their jobs. Sometimes, it is an opportunity to turn these challenges into opportunities. Unfortunately, most thinking taught and predicted in educational organisations is analytical. However, in the real world, innovative marketing performance and forward-looking behaviours and factors affecting it need more attention. Consequently, it is crucial to consider the factors that influence Innovative Marketing Performance in education and institutions. This study's primary objective is to investigate how proactive conduct mediates the relationship between innovative and supportive leadership.

Study Hypotheses and Study Model

H¹: Supportive leadership has a considerable impact on Marketing's proactive behaviour.

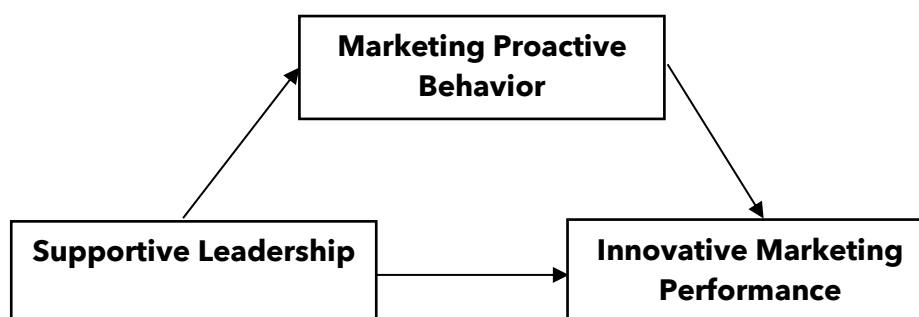
H²: Supportive leadership has a significant impact on Innovative Marketing Performance.

H³: Marketing Proactive behaviour has a significant effect on Innovative Marketing Performance.

H⁴: Marketing Proactive behaviour mediates the relationship between supportive leadership and Innovative Marketing Performance

Figure 1

Study Model



Study Method

The purpose of the study is to examine how proactive marketing practices mediate the relationship between successful creative marketing and encouraging leadership. Moreover, the study is categorised as applied research because its findings are relevant to multiple service sectors. The field approach (questionnaire) is used in this structural equation-based descriptive

survey to describe a circumstance or series of occurrences. The Al Kafeel Group for Public Investments, comprising nine businesses operating in various manufacturing industries within Iraq's Middle Euphrates region, serves as the statistical community for this study.

The sample of 195 individuals was selected using the simple random sampling procedure, as determined by Cochran's formula. This research collected data for hypothesis testing using the field technique and the library method to construct theoretical underpinnings and literature. The library approach included books, periodicals, journals, and master's and doctoral theses. A questionnaire was used, which consisted of two demographic sections and significant questions. Gender and history are among the demographic or general inquiries. The findings revealed that 27% of the sample consisted of males and 73% females. Only 25% of the participants had more than 10 years of work experience, while 65% had 11–15 years of experience. Ten per cent have been in their current positions for more than fifteen years. Respondents are requested to provide their ideas in a Likert-style answer letter ranging from very little to very large in the critical questions section.

The validity of the questionnaire was implicitly validated in this study due to its standardisation. We used the average variance extracted (AVE) to assess the study's convergent validity. The reliability of the questionnaire was assessed using Cronbach's alpha and CR composite reliability. The Cronbach's alpha level is kept above 0.7. Frenell and Locker (1981) recommend a high level of 0.5 and 0.7 for AVE and CR, respectively. PLS software and structural equation methods are examples of data analysis technologies. The PLS technique uses two steps to analyse and understand structural equation modelling: the measurement model test and the structural model test. Below is a description of each stage.

Types Of Mediation Effect

Baron and Kenny (1986) developed the mediation analysis approach thirty years ago, and many academics continue to use it today. According to a recent study by Zhao et al. (2010), which summarised earlier mediation analysis research and provided possibilities for the future, researchers have identified conceptual and methodological issues with the approach proposed by Baron and Kenny (1986). Disintermediation is divided into two primary categories by the authors:

- There is no mediation; the direct influence is considerable, whereas the indirect influence is not.
- There is no mediation without an effect; both direct and indirect influences are insignificant.

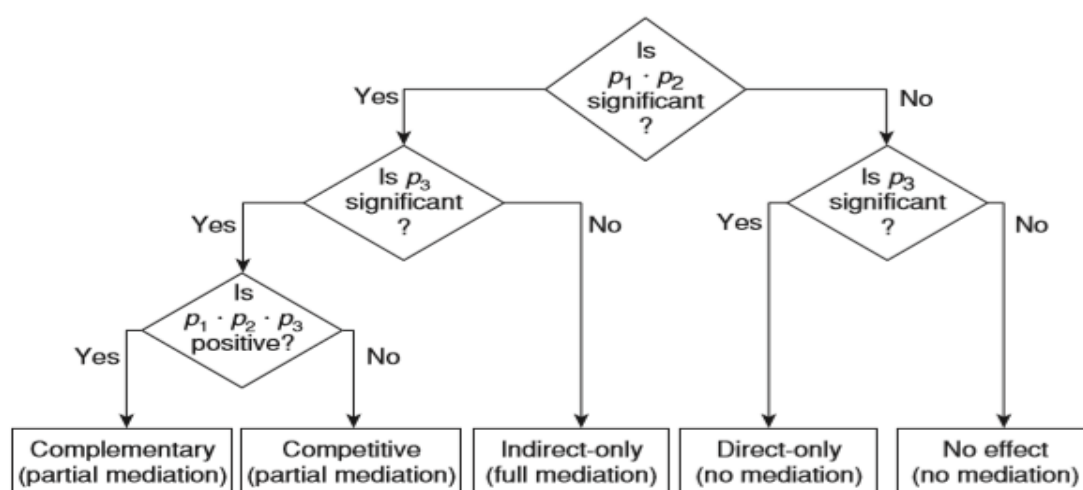
The study identifies three types of mediation: complementary, competitive, and indirect. Complementary mediation involves similar and significant direct and indirect impacts, while competitive mediation involves considerable and opposing direct and indirect impacts, and only indirect mediation focuses on indirect impacts.

Zhao et al. (2010)'s approaches align with the concepts of partial and complete mediation outlined by Baron and Kenny (1986). When the direct effect is minimal, indirect mediation is the only viable option. However, when both the direct and indirect effects are significant, it is possible to discriminate between complementary and competing mediation.

In contrast to competitive mediation, which has a negative direct effect and an indirect effect product, complementary mediation directs both direct and indirect effects in the same direction. The existence of a second mediator, whose indirect influence has the same sign as the direct effect, is implied by competing mediation, even though it supports the suggested mediating effect. The mediating construct functions as a suppressor variable, reducing the overall effect of the first variable on the third. The analytical procedure is as follows:

Figure 2

The process of mediation analysis



Source: Hayer et al., 2021

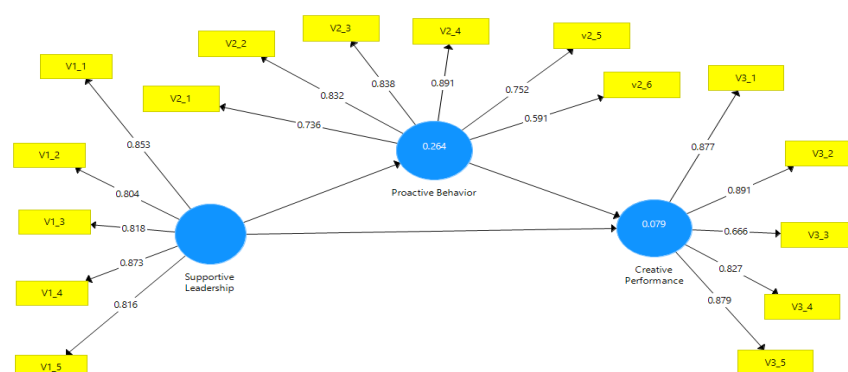
Data Analysis

1- The Measurement Model Testing

1-1- At the indicator level, convergent validity is the state in which all observed variables' factor loads are greater than 0.4, indicating the validity of all items and variables.

Figure 3

Convergent Validity at The Level Of Factors: Factor Loadings



In this phase, questions with a factor loading of less than 0.4 were extracted from both the elimination and final models. In this model, all questions have a factor loading over 0.4, indicating

that the items effectively measure the data.

1-2- Using the mean of the recovered variance at the level of latent variables or components, convergent validity AVE: AVE values of 0.5 or higher, as defined by Frenell and Locker (1981), show that the construct Opinion accounts for at least 50% of the variation of its component elements. The standard variance for each structure is shown in Table 2.

Table 2

Employing the extracted average variance

For examining the convergent validity at the component level

	(AVE)
Innovative Marketing Performance	0.693
Marketing Proactive Behavior	0.607
Supportive Leadership	0.694

The measurement tool's appropriate validity is demonstrated by the fact that the convergent validity of all variables exceeds 0.5 at the factor level. Using composite reliability criteria and Cronbach's alpha, the measurement models are evaluated, as shown in the results table that follows:

Table 3

Composite Reliability and Cronbach's Alpha Results

	Cronbach's Alpha	Composite Reliability
Innovative Marketing Performance	0.893	0.918
Marketing Proactive Behavior	0.87	0.901
Supportive Leadership	0.89	0.919

The composite reliability and Cronbach's alpha findings are verifiable and exceed 0.7.

2- According to Chin (1998), there should be two criteria used to evaluate the auditor's validity or diagnostic validity:

2-1- The components or indicators of a structure should endure the highest factor load such that other structures suffer the least amount of sectional stress. This is known as item-level assessor or diagnostic validity. Giffen and Ashtrab (2005) state that the factor load on the construct that corresponds to each item should be at least 0.1 more than the factor load on all other constructs.

Table 4

Auditor validity or diagnostic validity at the item level

	Innovative Marketing Performance	Marketing Proactive Behavior	Supportive Leadership
V1_1	0.373	0.414	0.853
V1_2	0.113	0.456	0.804
V1_3	0.188	0.38	0.818
V1_4	0.316	0.451	0.873
V1_5	0.08	0.439	0.816
V2_1	0.042	0.736	0.353
V2_2	0.127	0.832	0.562
V2_3	-0.019	0.838	0.364
V2_4	0.069	0.891	0.462
V3_1	0.877	0.036	0.274
V3_2	0.891	0.037	0.236
V3_3	0.666	0.107	0.08
V3_4	0.827	0.159	0.256
V3_5	0.879	0.01	0.174
v2_5	-0.144	0.752	0.289
v2_6	0.235	0.591	0.216

The validity of the diagnostic tool is supported by the fact that each construct has the lowest cross-sectional load (at most 0.4) and the most significant factor load (at least 0.4) on other constructs, demonstrating that the diagnosis is made at the item level.

2-2- A construct must have a square root of AVE that is larger than its correlation with other constructs for it to be valid or diagnostically valid at the factor or concept divergence level. This implies that compared to other structures, the structure has a greater correlation with its indicators. By examining the components or structural divergence displayed below, one can assess the validity of the assessment or diagnosis.

Table 5

Diagnostic Validity at The Constructs Divergence Level

	1	2	3
Innovative Marketing Performance	0.832		
Marketing Proactive Behavior	0.074	0.779	
Supportive Leadership	0.27	0.514	0.833

According to Fornell and Larcker's method, the second occurrence of divergence (at the structural level) can be regarded as valid if the elements on the diameter of the matrix are greater than the values in the cells beneath them. The accompanying table clearly shows that the diagonal components are always larger than the values below them, establishing the validity of the criteria at the factor level.

4-5- Test of Hypotheses

Both structural models' orientations were assessed, and the theories were looked into. The number of arrows on each route represents its coefficient, which is based on one of the model's

assumptions. The path coefficient (beta) between each variable and the dependent variable is evaluated for magnitude, sign, and statistical significance for each hypothesis. The route coefficient illustrates how one structure directly affects another. A larger route coefficient indicates a higher predictive influence of the hidden variable. The relevant coefficient is suitable for assessing the results of the connections between independent and dependent variables in the current study, as well as for illustrating the importance of the interactions between these variables. Each path coefficient t-value should be analysed to ascertain the path coefficient or beta's magnitude and relevance.

Figure 4

The investigated research model's hypotheses (regression coefficient and R^2)

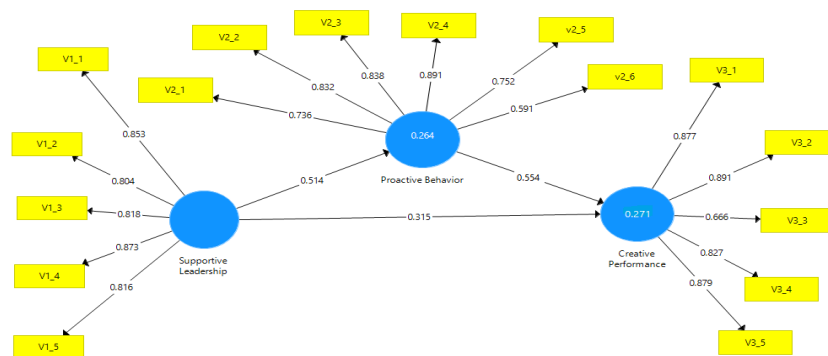


Figure 5

The hypotheses' investigated research model (P values)

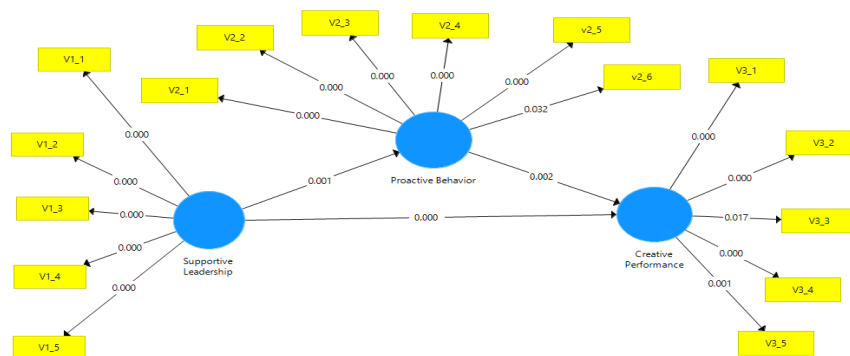
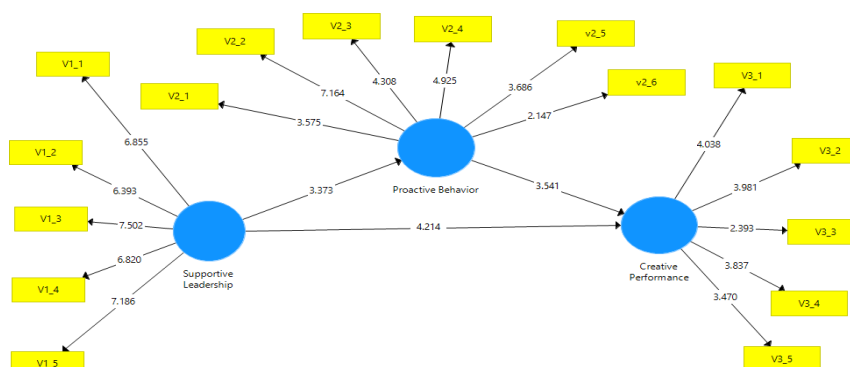


Figure 6

The hypotheses' investigated research model (T values)



The results of the program show that all hypotheses have a significance level below 0.05, indicating that the chosen sample or population does not have a beta value of zero. The beta value of 0.514 was obtained in the first hypothesis, indicating that supportive leadership has a 51% impact on Marketing proactive behaviour. This implies that 51% of the shifts in proactive behaviour in marketing can be attributed to supportive leadership. The t-statistic must be greater than 1.96 to validate the hypothesis. This figure corresponds to 3.37 in the software's output. Consequently, this idea is confirmed.

The H2, with a beta value of 0.315, suggests that supportive leadership has a significant influence on Innovative Marketing Performance, indicating that 31% of pioneers' behaviour changes are linked to supportive leadership. To verify the hypothesis, the t-statistic must be greater than 1.96. This value corresponds to 4.21 in the software's output. Therefore, this idea is accurate.

According to the H3's beta value of 0.554, innovative marketing performance is influenced by progressive behaviour to a degree of 55%. This suggests that 55% of the improvements in Innovative Marketing Performance are due to progressive behaviour. To validate the hypothesis, the t-statistic should be larger than 1.96. This number corresponds to 4.21 in the program output. As a result, we may infer that this hypothesis has been validated.

The H4 focuses on the role of proactive marketing behaviour as a mediator in the relationship between innovative marketing performance and supportive leadership. To investigate this subject, it is necessary to consider the indirect influence of supportive leadership on the performance of innovative marketing. This impact was 0.133, which was statistically significant at the 95% confidence level. Consequently, the initial condition was verified. The second step should analyse the output, which is significant and equivalent to 0.315, to determine the direct relationship between creative marketing performance and supportive leadership.

Furthermore, this results in an overall effect of 0.648, which is statistically significant. Therefore, it is verified that the mediating influence of proactive marketing behaviour indirectly impacts the relationship between supportive leadership and innovative marketing performance. Furthermore, the observation of a significant direct effect implies that this effect is partial.

Conclusion

The results revealed that proactive marketing behaviour is influenced by supportive leadership. These findings align well with research (Boudrias et al., 2021; Amanah et al., 2022). The performance of innovative marketing depends on supportive leadership. These findings align well with the research of Bannay et al. (2020). Innovative marketing performance is influenced by proactive marketing behaviour. The current work's findings agree with those of Fadhil (2024).

Marketing proactive behaviour occurs between supportive leadership and Innovative Marketing Performance relationships. Today, the key to the success of educational institutions is providing creative services tailored to different needs. The capital and central element of education and schools are teachers and managers, whose familiarity with Innovative Marketing Performance plays a crucial role in addressing and adapting to the challenges and difficulties of their jobs. These findings align well with the research of Hussain et al. (2024), emphasising the importance of

strategic innovation capabilities in enhancing the strategic niche of organisations.

Sometimes, it is an opportunity to turn these challenges into opportunities, so looking at their influencing factors and variables is necessary. Note. Considering the effectiveness of supportive leadership on Innovative Marketing Performance and proactive marketing behaviour, it is necessary to give great importance to respect, trust, and fellowship among members and avoid using directive styles.

Leaders should be available and aware of their subordinates' problems, and the group's interests should take precedence over all else. Additionally, the leader must maintain a friendly relationship with their employees to meet their needs and avoid high-order styles. If tasks are assigned in a supportive manner, leadership will improve employee performance. The current work's findings agree with those of (Shaheed et al., 2023)

References

- Afsar, B., & Masood, M. (2018). Transformational leadership, creative self-efficacy, trust in supervisor, uncertainty avoidance, and innovative work behavior of nurses. *The Journal of Applied Behavioral Science*, 54(1), 36–61. <https://doi.org/10.1177/0021886317711891>
- Alpkan, L., Bulut, C., Gunday, G., Ulusoy, G., & Kilic, K. (2010). Organizational support for intrapreneurship and its interaction with human capital to enhance innovative performance. *Management Decision*, 48(5), 732–755. <https://doi.org/10.1108/00251741011043902>
- Amanah, A. A., Hussein, S. A., & Bannay, D. F. (2022). Role of proactive behavior in entrepreneurial alertness: A mediating role of dynamic capabilities. *Problems and Perspectives in Management*, 20(4), 127–137. [https://doi.org/10.21511/ppm.20\(4\).2022.10](https://doi.org/10.21511/ppm.20(4).2022.10)
- Bannay, D. F., Hadi, M. J., & Amanah, A. A. (2020). The impact of inclusive leadership behaviors on innovative workplace behavior with an emphasis on the mediating role of work engagement. *Problems and Perspectives in Management*, 18(3), 479–491. [https://doi.org/10.21511/ppm.18\(3\).2020.39](https://doi.org/10.21511/ppm.18(3).2020.39)
- Belawati, F. E., Setyadi, D., & Hendri, M. I. (2019). Effect of transformational leadership style and knowledge management on organizational innovation through empowerment, member creativity and learning organization. *Journal of Arts and Humanities*, 8(8), 1–16. <https://doi.org/10.18533/journal.v8i8.1665>
- Carmeli, A., Gelbard, R., & Reiter-Palmon, R. (2013). Leadership, creative problem-solving capacity, and creative performance: The importance of knowledge sharing. *Human Resource Management*, 52(1), 95–121. <https://doi.org/10.1002/hrm.21514>
- Choi, S. B., Kim, K., Ullah, S. E., & Kang, S. W. (2016). How transformational leadership facilitates innovative behavior of Korean workers: Examining mediating and moderating processes. *Personnel Review*, 45(3), 459–479. <https://doi.org/10.1108/PR-03-2014-0058>
- Chuang, Y., Chiang, H., & Lin, A. (2019). Helping behaviors convert negative affect into job satisfaction and innovative behavior: The moderating role of work competence. *Personnel*

- Review*, 48(6), 1530-1547. <https://doi.org/10.1108/PR-10-2018-0415>
- De Stobbeleir, K. E., Ashford, S. J., & Buyens, D. (2011). Self-regulation of creativity at work: The role of feedback-seeking behavior in creative performance. *Academy of Management Journal*, 54(4), 811-831. <https://doi.org/10.5465/amj.2011.64870144>
- Dong, Y., Bartol, K. M., Zhang, Z. X., & Li, C. (2017). Enhancing employee creativity via individual skill development and team knowledge sharing: Influences of dual-focused transformational leadership. *Journal of Organizational Behavior*, 38(3), 439-458. <https://doi.org/10.1002/job.2134>
- Fadhil, A. H., Abdulrasool, A. M., Al-Hakeem, L. M., Amanah, A. A., & Hussain, A. N. (2024). The role of strategic physiognomy in excellent marketing performance. *Business: Theory and Practice*, 25(2), 585-592. <https://doi.org/10.3846/btp.2024.20358>
- Hon, A. H., & Lui, S. S. (2016). Employee creativity and innovation in organizations: Review, integration, and future directions for hospitality research. *International Journal of Contemporary Hospitality Management*, 28(5), 862-885. <https://doi.org/10.1108/IJCHM-09-2014-0454>
- Hussain, Z. N., Hussain, A. N., Olaywi, A. H., Amanah, A. A., & Fadhil, A. H. (2024). Role of strategic innovation capabilities in enhancing strategic niche of Iraqi industrial companies. *International Journal of eBusiness and eGovernment Studies*, 16(1), 86-110. <https://doi.org/10.34111/ijebe.2024160104>
- Ismail, H. N., Iqbal, A., & Nasr, L. (2019). Employee engagement and job performance in Lebanon: The mediating role of creativity. *International Journal of Productivity and Performance Management*, 68(3), 506-523. <https://doi.org/10.1108/IJPPM-02-2018-0052>
- Jaiswal, N. K., & Dhar, R. L. (2015). Transformational leadership, innovation climate, creative self-efficacy and employee creativity: A multilevel study. *International Journal of Hospitality Management*, 51, 30-41. <https://doi.org/10.1016/j.ijhm.2015.07.002>
- Jiang, W., Zhao, X., & Ni, J. (2017). The impact of transformational leadership on employee sustainable performance: The mediating role of organizational citizenship behavior. *Sustainability*, 9(9), Article 1567. <https://doi.org/10.3390/su9091567>
- Koohang, A., Paliszkievicz, J., & Goluchowski, J. (2017). The impact of leadership on trust, knowledge management, and organizational performance: A research model. *Industrial Management & Data Systems*, 117(3), 521-537. <https://doi.org/10.1108/IMDS-02-2016-0072>
- Kremer, H., Villamor, I., & Aguinis, H. (2019). Innovation leadership: Best-practice recommendations for promoting employee creativity, voice, and knowledge sharing. *Business Horizons*, 62(1), 65-74. <https://doi.org/10.1016/j.bushor.2018.08.010>
- Lee, A., Legood, A., Hughes, D., Tian, A. W., Newman, A., & Knight, C. (2020). Leadership, creativity and innovation: A meta-analytic review. *European Journal of Work and Organizational Psychology*, 29(1), 1-35. <https://doi.org/10.1080/1359432X.2019.1661837>
- Li, H., Sajjad, N., Wang, Q., Muhammad Ali, A., Khaqan, Z., & Amina, S. (2019). Influence of

- transformational leadership on employees' innovative work behavior in sustainable organizations: Test of mediation and moderation processes. *Sustainability*, 11(6), Article 1594. <https://doi.org/10.3390/su11061594>
- Miao, Q., Newman, A., Schwarz, G., & Cooper, B. (2018). How leadership and public service motivation enhance innovative behavior. *Public Administration Review*, 78(1), 71–81. <https://doi.org/10.1111/puar.12839>
- Newman, A., Herman, H. M., Schwarz, G., & Nielsen, I. (2018). The effects of employees' creative self-efficacy on innovative behavior: The role of entrepreneurial leadership. *Journal of Business Research*, 89, 1–9. <https://doi.org/10.1016/j.jbusres.2018.04.001>
- Qi, L., Liu, B., Wei, X., & Hu, Y. (2019). Impact of inclusive leadership on employee innovative behavior: Perceived organizational support as a mediator. *PLoS ONE*, 14(2), Article e0212091. <https://doi.org/10.1371/journal.pone.0212091>
- Shaheed, J. M., Alabdily, D. H., & Amanah, A. A. (2023). Strategic physiognomy and its impact on achieving outstanding performance. *International Journal of eBusiness and eGovernment Studies*, 15(3), 202–220. <https://doi.org/10.34111/ijepeg.2023150305>
- Shao, Y., Nijstad, B. A., & Täuber, S. (2019). Creativity under workload pressure and integrative complexity: The double-edged sword of paradoxical leadership. *Organizational Behavior and Human Decision Processes*, 155, 7–19. <https://doi.org/10.1016/j.obhdp.2019.01.004>
- Sweetman, D., Luthans, F., Avey, J. B., & Luthans, B. C. (2011). Relationship between positive psychological capital and creative performance. *Canadian Journal of Administrative Sciences*, 28(1), 4–13. <https://doi.org/10.1002/cjas.175>
- Taştan, S. B. (2016). Psychological capital: A positive psychological resource and its relationship with innovative behavior. *Anadolu Üniversitesi Sosyal Bilimler Dergisi*, 16(2), 101–118. <https://doi.org/10.18037/ausbd.389667>
- Van Dierendonck, D., & Rook, L. (2010). Enhancing innovation and creativity through servant leadership. In D. van Dierendonck & K. Patterson (Eds.), *Servant leadership: Developments in theory and research* (pp. 155–165). Palgrave Macmillan. https://doi.org/10.1057/9780230299184_12
- Wang, A. C., & Cheng, B. S. (2010). When does benevolent leadership lead to creativity? The moderating role of creative role identity and job autonomy. *Journal of Organizational Behavior*, 31(1), 106–121. <https://doi.org/10.1002/job.634>
- Wu, C. H., & Parker, S. K. (2017). The role of leader support in facilitating proactive work behavior: A perspective from attachment theory. *Journal of Management*, 43(4), 1025–1049. <https://doi.org/10.1177/0149206314544745>
- Zacher, H., Robinson, A. J., & Rosing, K. (2016). Ambidextrous leadership and employees' self-reported innovative performance: The role of exploration and exploitation behaviors. *The Journal of Creative Behavior*, 50(1), 24–46. <https://doi.org/10.1002/jocb.66>



The Impact of Government Policies on Business Strategy: A Comparative Study of Emerging and Developed Economies

Syeda Sana Gillani¹, MD Shafiqul Islam²

¹ School of Economics and Management, North China University of Water Resources and Electric Power, China

² School of Economics and Management, China University of Geosciences Wuhan, China

✉ **Corresponding author:**
haseebnawaz509@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: Government policies play a crucial role in shaping the business environment, influencing corporate decision-making, competitiveness, and long-term sustainability. This study examines the impact of government policies on business strategy by comparing emerging and developed economies. Using insights from existing literature, economic theory, and case studies, the paper highlights how taxation, trade regulations, labour laws, environmental standards, and innovation policies affect firms differently across contexts. The analysis reveals that while developed economies often provide stable regulatory frameworks that support innovation and strategic planning, emerging economies exhibit policy volatility, which forces firms to adopt adaptive, short-term survival strategies. The study concludes with recommendations for policymakers and managers to align government policies with sustainable business growth.

KEYWORDS: Government policies, business strategy, emerging economies, developed economies, fiscal policy, trade regulation, policy volatility, innovation, sustainability, competitiveness.

How to cite: Gillani, S. S., & Islam, M. S. (2025). The impact of government policies on business strategy: A comparative study of emerging and developed economies. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 95-100). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17346009>

Introduction

The relationship between government policies and business strategy has long been a central theme in the fields of economics, management, and public policy. Governments play a vital role in shaping the external environment within which businesses operate. Through instruments such as fiscal policy, taxation systems, trade agreements, subsidies, labour market regulations, and environmental standards, governments establish the “rules of the game” that guide organisational behaviour. For businesses, these rules represent both opportunities and constraints, requiring firms to adapt their strategies to remain competitive and sustainable continuously. In this way, government intervention in the economy becomes a powerful determinant of corporate decision-making, investment behaviour, and long-term strategic direction.

In developed economies, government policies are typically characterised by stability, transparency, and institutional strength. Policies in such contexts are often the result of extensive consultation, evidence-based decision-making, and effective enforcement mechanisms. For example, predictable taxation frameworks and supportive monetary policies allow firms to make long-term investment decisions with confidence. Similarly, structured labour laws and strong property rights create an environment in which innovation and entrepreneurship can flourish. These conditions enable businesses to align their strategies with government priorities, pursue innovation-driven growth, and integrate into global markets with reduced risk.

By contrast, businesses operating in emerging economies often encounter policy environments that are volatile, inconsistent, or vulnerable to political influence. Factors such as corruption, weak institutional capacity, bureaucratic inefficiencies, and sudden regulatory shifts undermine the ability of firms to plan strategically over the long term. Instead, many companies in these economies adopt short-term, adaptive strategies aimed primarily at survival. For instance, firms may rely on diversification, informal networks, or opportunistic decision-making to navigate policy unpredictability. While such strategies can sustain businesses in the short run, they often limit their ability to compete globally, invest in research and development, or adopt sustainable practices.

The comparative differences between developed and emerging economies underscore the importance of understanding how government policies influence business strategy across diverse contexts. In developed economies, firms tend to enjoy a symbiotic relationship with governments: businesses contribute to economic growth, employment, and innovation, while governments provide a stable environment that supports long-term planning. Conversely, in emerging economies, the relationship is more complex and often characterised by tension. Businesses must frequently respond to abrupt policy changes, shifting tax structures, or protectionist trade measures, which can restrict competitiveness and hinder growth.

This divergence has important implications not only for managers and entrepreneurs but also for policymakers seeking to foster sustainable economic development. Governments in emerging economies often aspire to replicate the stability and innovation ecosystems of developed nations, yet the challenges of institutional reform and policy enforcement remain substantial. Similarly, multinational corporations expanding into emerging markets must design strategies that are

sufficiently flexible to withstand policy shocks while also leveraging opportunities created by government incentives.

The study of government policies and business strategy, therefore, provides valuable insights into how institutional environments shape organisational behaviour. It also contributes to the broader understanding of economic development by highlighting the interplay between governance, policy frameworks, and private sector competitiveness. By conducting a comparative analysis of emerging and developed economies, this research seeks to answer a critical question: *How do government policies shape business strategies differently across economic contexts?*

In addressing this question, the paper emphasises five key policy domains—fiscal and taxation frameworks, trade regulations, labour market policies, environmental standards, and innovation policies. Each of these domains carries significant implications for how firms strategise in terms of investment, market entry, human resource management, sustainability, and global expansion. By examining these domains through case studies and theoretical perspectives, the study aims to reveal the nuanced ways in which businesses adapt to their policy environments.

Ultimately, understanding these dynamics is essential for both scholars and practitioners. For managers, such insights highlight the need for context-specific strategies that align with governmental frameworks while maintaining flexibility. For policymakers, the analysis underscores the importance of designing policies that not only regulate but also enable businesses to innovate, compete, and contribute to national economic growth. For researchers, the comparative approach offers a deeper theoretical and practical understanding of how institutions shape corporate strategy in varied economic settings.

Literature Review

Government Policies and Business Environment

Government policies shape the broader institutional and economic environment in which businesses operate. Scholars widely acknowledge that fiscal and monetary policies have a direct impact on firms' decision-making processes, cost structures, and investment behaviours. North (1990) emphasises that institutions, including government regulations, determine the rules of the game for economic activity, influencing how organisations respond to opportunities and constraints. Similarly, Porter (1998) argues that factors such as taxation, interest rates, and subsidies directly alter firms' competitive positions. For instance, favourable tax regimes encourage research and development, while high-interest rates may discourage borrowing and long-term investment. Thus, government interventions can either stimulate or hinder strategic business initiatives.

Developed Economies

In developed economies, government policies are typically characterised by stability, predictability, and strong institutional frameworks. Countries such as the United States, Germany, and Japan have implemented regulatory environments that encourage innovation, protect property rights, and promote global market integration. Hall and Soskice (2001), in their *Varieties of Capitalism* framework, highlight that firms in liberal market economies (e.g., the U.S.) rely heavily on competitive markets. In contrast, coordinated market economies (e.g., Germany and Japan)

benefit from strong collaboration between government, industry, and labour unions. Both models, however, are underpinned by institutional stability, enabling firms to adopt proactive, long-term strategies. These include investments in advanced technologies, sustainability practices, and international expansion, which are supported by clear and enforceable policies.

Emerging Economies

In contrast, emerging economies often present business environments marked by policy volatility, weak institutional capacity, and political influence. Countries such as India, Brazil, and Pakistan provide examples where frequent regulatory changes, bureaucratic inefficiencies, and corruption complicate strategic planning. Khanna and Palepu (2010) argue that in such contexts, firms often develop “institutional voids” strategies—building networks, creating informal governance mechanisms, or relying on diversification to offset uncertainty. While these adaptive measures enable survival, they rarely foster the same level of innovation and global competitiveness seen in developed economies. For example, unpredictable tax regimes in Brazil or inconsistent trade policies in Pakistan limit firms’ ability to pursue long-term investments. Instead, businesses frequently adopt short-term, reactive strategies that prioritise flexibility over stability.

Gaps in Literature

Although a substantial body of research exists on the impact of government policies on economic performance, there are notable gaps in the literature. Most studies focus either on macroeconomic outcomes, such as growth, inflation, or trade balances, or on firm-level adaptations in isolation. Few have integrated both perspectives to explore how government policy frameworks simultaneously shape macro-level competitiveness and micro-level business strategies across different economic contexts. Additionally, much of the existing comparative research emphasises either developed or emerging economies independently, with limited focus on systematically contrasting the two. This leaves room for further exploration of how similarities and differences in institutional environments influence corporate strategies, particularly in the context of globalisation, technological transformation, and sustainability pressures. Addressing this gap will not only enrich theoretical understanding but also provide practical insights for policymakers and business leaders operating in diverse economic environments.

Methodology

This study employs a qualitative comparative research design to examine how government policies influence business strategies in emerging and developed economies. A qualitative approach is appropriate because it allows for in-depth exploration of institutional contexts, policy environments, and firm-level responses, which cannot be fully captured through quantitative indicators alone.

The research relies primarily on secondary data drawn from reputable international sources, including reports and databases published by the World Bank, the International Monetary Fund (IMF), and the Organisation for Economic Co-operation and Development (OECD). These sources provide reliable information on fiscal frameworks, trade regulations, labour market policies, and

governance structures across different economies. In addition, peer-reviewed academic literature and policy briefs are incorporated to strengthen the theoretical foundation of the analysis.

To complement these data, the study integrates case studies of firms operating in both developed and emerging economies. Examples include multinational corporations from the United States, Germany, and Japan on the developed side, and leading firms from India, Brazil, and Pakistan on the emerging side. These case studies illustrate how businesses adapt their strategies under varying policy conditions, highlighting both the constraints and opportunities shaped by government interventions.

The analysis adopts a comparative institutional approach, which emphasises the role of institutions and policy frameworks in shaping business behaviour. This framework is beneficial for identifying contrasts between the stability and predictability of developed economies and the volatility and institutional weaknesses often present in emerging markets. By synthesising cross-national data with firm-level evidence, the methodology ensures a balanced perspective that links macro-level policy environments with micro-level strategic decisions.

Case Studies

Case 1: Tesla (Developed Economy - U.S.)

Tesla benefits from government incentives, including tax credits for electric vehicles and support for renewable energy. Stable policies encourage innovation-driven strategies.

Case 2: Tata Group (Emerging Economy - India)

Tata faces policy volatility in taxation and trade tariffs. Its strategy emphasises diversification and flexibility to survive uncertain environments.

Case 3: Huawei (Emerging-to-Developed Transition - China)

China's strong state-led industrial policies provided Huawei with subsidies and global competitiveness, showing how strategic policies can transform an economy.

Conclusion

Government policies play a decisive role in shaping the strategic direction of businesses, yet their effects vary considerably between developed and emerging economies. In developed contexts, the presence of stable regulatory frameworks, transparent governance, and vigorous institutional enforcement fosters an environment conducive to long-term planning. Firms can invest confidently in innovation, sustainability, and global expansion by anticipating and aligning with government priorities. Such stability not only strengthens competitiveness but also enhances resilience in the face of global market fluctuations. In contrast, emerging economies present a more complex and often challenging policy environment. Frequent regulatory changes, weak institutional capacity, and political instability contribute to uncertainty that directly affects corporate decision-making. As a result, firms in these economies frequently adopt short-term, adaptive strategies focused on flexibility and survival rather than proactive innovation. While these approaches may enable businesses to remain viable, they often limit their ability to integrate into global markets or sustain long-term growth.

The comparative analysis underscores the importance of aligning government policies with the strategic needs of businesses. Policymakers in emerging economies should focus on reducing policy volatility, strengthening institutional frameworks, and creating incentives for innovation and investment. At the same time, managers operating across diverse contexts must remain attentive to policy environments, designing strategies that balance adaptability with long-term vision. Ultimately, the study highlights that sustainable economic growth and business competitiveness require a synergistic relationship between governments and firms. Effective policies provide the stability and direction that businesses need, while responsive corporate strategies ensure that national economies benefit from innovation, employment, and global integration.

References

- Acemoglu, D., & Robinson, J. A. (2012). *Why nations fail: The origins of power, prosperity, and poverty*. Crown Business.
- Aghion, P., & Howitt, P. (2009). *The economics of growth*. MIT Press.
- Hall, P. A., & Soskice, D. (2001). *Varieties of capitalism: The institutional foundations of comparative advantage*. Oxford University Press.
- Khanna, T., & Palepu, K. G. (2010). *Winning in emerging markets: A road map for strategy and execution*. Harvard Business Press.
- North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press.
- Porter, M. E. (1998). *The competitive advantage of nations*. Free Press.
- Rodrik, D. (2008). *One economics, many recipes: Globalisation, institutions, and economic growth*. Princeton University Press.
- Stiglitz, J. E. (2002). Principles of corporate finance. *OECD Journal: Financial Market Trends*, 2002(1), 123-145. <https://doi.org/10.1787/fmt-v2002-art4-en>
- Williamson, O. E. (1985). *The economic institutions of capitalism*. Free Press.



Why Women Work Harder Than Men: Gender Norms, Patrilocality, and Labor Market Inequalities in Kazakhstan and Kyrgyzstan

Irina Kovaleva¹, Alma Kudebayeva^{2*}, Gerald Pech³

¹MAE (Master of Arts in Economics), PhD Candidate, Adjunct Lecturer, Department of Economics, KIMEP University, 2 Abai Avenue, Almaty, 050010, Republic of Kazakhstan

²PhD, Associate Professor, Department of Economics, KIMEP University, 2 Abai Avenue, Almaty, 050010, Republic of Kazakhstan

³PhD, Associate Professor, Department of Economics, KIMEP University, 2 Abai Avenue, Almaty, 050010, Republic of Kazakhstan

✉ **Corresponding author:** almak@kimep.kz



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study investigates why women demonstrate higher work effort than men in Kazakhstan and Kyrgyzstan, focusing on gender norms, patrilocal traditions, and labor market inequalities. The analysis uses secondary household microdata from the Life in Kyrgyzstan survey (2016–2019) and econometric methods (OLS, Heckman selection, and Oaxaca-Blinder decomposition), complemented by prior empirical findings from published studies. The results reveal that social norms and family relocation patterns disproportionately pressure women to demonstrate high work effort, while structural labor market disparities limit their career advancement. The findings highlight the intersection of culture and labor policies, offering insights for gender-sensitive workforce strategies in Central Asia.

KEYWORDS: gender roles, labor market inequality, work effort, cultural norms, Central Asia, patrilocality.

How to cite: Kovaleva, I., Kudebayeva, A., & Pech, G. (2025). Why women work harder than men: Gender norms, patrilocality, and labor market inequalities in Kazakhstan and Kyrgyzstan. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 101-108). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17378278>

Introduction

The issue of gender differences in labor activity is a significant topic in both economics and sociology of labor. However, previous studies (Han, 2025; Trevisani, 2021; Kovaleva et al., 2025) have primarily focused on general patterns of women's participation in the professional sphere and the influence of economic factors, while giving less attention to the cultural and familial traditions of Central Asia. Earlier research by Kovaleva et al. (2025a, 2025b, 2025c) systematically examined these patterns using household-level microdata from Kazakhstan and Kyrgyzstan. In contrast, our study provides a comprehensive analysis of the interrelation between patrilocality, social norms, and structural constraints of the labor market, as well as their combined impact on women's labor activity. In regions where patrilocal traditions prevail, women tend to display high diligence and engagement in professional activity even under conditions of limited career prospects and unequal pay. Patrilocality indirectly stimulates high levels of labor participation since limited mobility and social expectations shape compensatory behavioral strategies. The new theoretical conclusion is that patrilocal social structures not only restrict women's economic opportunities but also cultivate internal motivation for intense labor activity, functioning as a compensatory mechanism for structural inequalities. These results confirm and extend findings from "Why Do Women Work Harder Than Men? Testing the Patrilocality Hypothesis" (Kovaleva, 2023a). In addition, this allows for a more accurate modeling of the interplay between cultural, social, and economic factors in shaping gender behavior in the labor market.

Table 1

Interrelation of Cultural, Economic, and Family Factors with Women's Labor Activity in Central Asia

Factor	Mechanism of Influence	Manifestations in Women's Labor Activity	Sources
Cultural norms (patrilocality, gender expectations)	Restricted access to resources and prioritization of sons motivate women to demonstrate diligence and devotion to work.	High discipline, productivity, and aspiration for recognition through work.	Kazenin (2023); Kenzhebaeva & Kim (2022)
Social control and the culture of shame	Support for traditional roles through moral and social pressure forces women to perform excessive duties.	Compensatory labor combining professional employment and domestic responsibilities.	Kenzhebaeva & Kim (2022)
Labor migration and economic dual dependency	Limited opportunities in the new labor market compel women to work more intensively for survival and family support.	Increased work commitment and adaptive strategies.	Hofmann & Chi (2022); Akcapar & Çakır (2024)
Socio-demographic conditions and domestic duties	Family care and limited access to social support intensify women's workload.	Dual labor (paid and invisible domestic), high work intensity.	Lomia et al. (2020); Nazridod et al. (2021)

Source: compiled by the authors

Hypothesis

Sociocultural factors and patrilocal practices contribute to higher levels of female labor participation compared to men.

Objective

Identification of the sociocultural and structural factors that contribute to higher female labor participation compared to men in Kazakhstan and Kyrgyzstan.

Objectives:

1. To analyze the gender norms and social expectations that influence labor behavior.
2. To assess the impact of patrilocal practices on the participation of women and men in the labor market.
3. To examine labor market inequality between men and women.

Research Results

Sociocultural Factors

The growing participation of women in the labor sphere in Kazakhstan and Kyrgyzstan is explained by a combination of sociocultural, economic, and historical factors that have shaped distinct gender roles. Studies have shown that women's labor has consistently combined professional responsibilities with a wide range of domestic and family duties. This dual role is determined not only by economic necessity but also by cultural expectations that demand greater diligence and discipline from women compared to men. Traditional notions of family and patriarchal practices reinforce a division of roles in which men acquire economic advantages and social authority, while women bear responsibility for maintaining familial stability and raising children. Within this system, women's work becomes not only an economic activity but also a means of self-realization and an affirmation of their social status within the family. Within household structures, gender asymmetry manifests itself in priorities related to inheritance, access to resources, and influence over decisions concerning the division of family duties. In patriarchally oriented households, preference is given to sons, which motivates women to prove their value through efficient work and family support. This dynamic is reinforced by additional social control mechanisms, such as a culture of shame, which regulates women's behavior and compels them to undertake an excessive number of responsibilities, including invisible domestic labor. Recent bibliometric evidence on gender and education also confirms the persistence of early structural inequalities that later translate into labor market disparities (Temirtayeva et al., 2025).

Technological Transformations

The transformation of the labor market under the influence of digitalization and automation has a complex and dual impact on women's employment. On one hand, the automation of traditional production and service processes creates a risk of job loss, particularly in low-skilled sectors, which may exacerbate existing gender inequalities. On the other hand, technological development provides new opportunities for women, including remote work that allows flexible time allocation between professional and family responsibilities, as well as access to professions related to STEM fields, digital

competencies, and innovative industries. Remote and hybrid employment enable women to combine career advancement with family care, while active acquisition of digital skills enhances their competitiveness in the labor market. Thus, processes of digitalization and technological transformation have the potential both to reduce and to reinforce gender inequality, depending on the extent to which social institutions, educational systems, and employment policies support equal access for women and men to emerging opportunities in the digital economy. This mechanism has also strengthened societal expectations of women's discipline and diligence, making their labor both an economic activity and a moral responsibility to the community. These observations are consistent with bibliometric evidence on automation and gender from Samatova et al. (2025).

Economic Inequality

Economic and social transformations, including migration processes, intensified gender differentiation in labor. Women who remained in local communities or migrated with their families demonstrated greater industriousness compared to men, performing tasks that extended beyond formally paid work. This included household maintenance, childcare and care for elderly relatives, as well as participation in additional economic projects that provided supplementary income. Consequently, women's labor activity became a complex phenomenon that combined economic, social, and cultural functions. Market inequalities were shaped by access to resources, education, and professional opportunities. Women were compelled to exert greater effort to achieve economic stability and ensure their families' financial security. At the same time, women's industriousness in many cases compensated for structural constraints associated with gender expectations and social inequality. It became a means of maintaining family integrity and survival under conditions of economic instability, as observed in both rural and urban regions. A combination of factors, including patrilocal traditions, the culture of shame, inequality in access to resources, socio-demographic conditions, and migration processes, created circumstances that led women to demonstrate greater labor dedication and diligence compared to men. Their labor performed dual functions: economic and socio-cultural, which intensified its importance and significance. In this sense, women's diligence was not an incidental phenomenon but rather a natural response to the region's social, economic, and cultural challenges. The decomposition of income inequality presented in Kovaleva (2023b) also supports this conclusion, showing persistent gaps despite equal qualifications.

Table 2

Causal Relationships Between Cultural Norms, Family Practices, and Labor Behavior

Factors	Causal Relationship	Manifestation in Labor Behavior
Cultural norms regarding the role of women in society	Traditional perceptions of female self-sacrifice, responsibility, and discipline shape expectations of high female engagement in labor	Greater dedication to work among women serves a compensatory function under conditions of socioeconomic inequality
Family practices of support and distribution of responsibilities	Limited male participation in household tasks and childcare encourages women to demonstrate stronger professional loyalty as a form of self-realization	Increased labor activity and resilience to professional burnout among women
Socioeconomic	Low wages and employment instability	Work is perceived as a source of

conditions	reinforce the need for self-preservation through professional commitment	social stability and personal dignity
Cultural capital and educational values	Educated women in post-Soviet societies more often associate success with professional achievement	Focus on career advancement and skills improvement
Gender stereotypes in the professional sphere	Limited opportunities for women's career advancement are offset by stronger motivation for high-quality task performance	High productivity and loyalty as a form of symbolic recognition

Source: compiled by the authors

Studies by Kovaleva et al. (2025a) on gender norms and women's labor behavior in Central Asian countries focused on identifying the interrelationship between cultural traditions, family social structures, and economic activity. The research examined how patrilocality, unequal distribution of domestic responsibilities, and social expectations influence women's labor motivation.

The analysis conducted by I. Kovaleva et al. (2025b) revealed that in societies with strong patriarchal foundations, the increased intensity of women's labor results not only from economic necessity but also from cultural pressure that encourages self-affirmation through work. Rising educational levels, urbanization, and the gradual transformation of societal perceptions of women's roles have contributed to shifting labor motivation from necessity to the desire for self-realization and personal fulfillment.

This process reflects a gradual transition from reproductive labor to participation in production and entrepreneurial initiatives, which has increased overall economic activity. Economic analysis has shown a persistent gender gap in wages, which remains even among individuals with equal qualifications and experience. Differences in income stem not only from market mechanisms but also from sociocultural factors, highlighting the influence of traditional beliefs and systemic biases (Kovaleva et al., 2025c).

These findings made it possible to interpret gender inequality as a multidimensional phenomenon shaped by cultural models, work ethics, and social expectations. Women's labor was viewed not only as an economic category but also as an indicator of social dynamics, reflecting changes in societal norms and the degree of gender equality. This interpretation allowed labor to be understood as an instrument of cultural emancipation and social development that defines the pace of modernization in post-Soviet societies.

In the contemporary context, it is also essential to consider the impact of technological change on labor activity, particularly the role of artificial intelligence and automation in redistributing jobs. Analysis of recent trends has shown that automation and the integration of AI are significantly transforming the labor market, simultaneously creating new opportunities and risks for workers. One of the consequences has been the emergence of new professions and the reduction of traditional forms of employment, which requires the adaptation of skills and continuous professional development (Samatova et al., 2025).

These changes are closely linked to gender dimensions, as labor market transformations affect men and women differently, either intensifying or mitigating existing socioeconomic inequalities.

Bibliometric analysis makes it possible to identify key trends through which digital technologies contribute to the formation of new professional roles, the redefinition of competence requirements, and the restructuring of employment patterns.

At the same time, it enables the identification of sectors with heightened risk of job loss and declining levels of economic security among specific population groups. These findings underscore the need to implement innovative vocational training instruments that account for gender differences in access to technology and employment, as well as to develop policies oriented toward balanced adaptation to digital transformations. In summary, the identified patterns, particularly the characteristics of gendered labor participation, the impact of technological change, and the role of migration factors, confirm the hypothesis that digitalization processes are not neutral but rather reproduce existing social disparities while simultaneously creating potential for their mitigation through targeted educational and social policy interventions.

Conclusions

This study demonstrated that the heightened labor activity of women in Kazakhstan and Kyrgyzstan resulted from the interaction of gender norms, patrilocal practices, and structural inequality in the labor market. The results build upon the broader framework of household structure and innovation (Kovaleva et al., 2025a) and gender wage decomposition (Kovaleva et al., 2025d), linking these mechanisms with the patrilocal hypothesis tested in earlier works. Women combined paid employment with invisible domestic labor, performed caregiving functions, and ensured family social stability, which required greater diligence and discipline from them compared to men. The culture of shame, the preference for sons in resource distribution, and men's limited capacity to perform household duties reinforced this tendency, transforming women's industriousness into a socio-cultural obligation and means of self-realization. It was revealed that labor migration, economic transformations, and urbanization additionally stimulated women to demonstrate high work capacity, as they compensated for structural constraints and ensured family survival under challenging socio-economic conditions. Prospects for further research in this direction include analysis of the impact of contemporary political and economic reforms on gendered employment, the role of education and vocational training in reducing inequality, as well as investigation of the psychological and social mechanisms supporting women's labor under conditions of labor market transformation and globalization.

This research was conducted within the framework of the Ministry of Science and Higher Education of the Republic of Kazakhstan, Grant IRN: AP23487405.

References

- Akcapar, S. K., & Çakır, D. (2024). Feminization of labour migration from Uzbekistan to Turkey: the role of neoliberal policies, patriarchy and social networks. *Central Asian Survey*, 44(3), 325-345. <https://doi.org/10.1080/02634937.2024.2402888>
- Han, R. (2025). *From Soviet Union to Independent Uzbekistan: An intersectional perspective of women's roles and challenges* (Publication No. 32122615) [Doctoral dissertation, Indiana University, Graduate School, Department of Central Eurasian Studies]. ProQuest Dissertations &

Theses

Global.

<https://www.proquest.com/openview/931afe1aaed8c5ab76bd66ff343764a5/1?pq-origsite=gscholar&cbl=18750&diss=y>

- Hofmann, E. T., & Chi, G. (2022). Bride kidnapping and gendered Labor Migration: Evidence from Kyrgyzstan. *Journal of Ethnic and Migration Studies*, 48(11), 2493-2514. <https://doi.org/10.1080/1369183x.2021.1931062>
- Kazenin, K. (2023). Son preference, gender asymmetries and parity progressions: the case of Kyrgyzstan. *Asian Population Studies*, 19(1), 5-21. <https://doi.org/10.1080/17441730.2021.1992858>
- Kenzhebaeva, Z., Kim, E. (2022). Ashamed to Mother: The Practice of 'Nebere Aluu' in Kyrgyzstan. In: Thibault, H., Caron, JF. (eds) *Uyat and the Culture of Shame in Central Asia. The Steppe and Beyond: Studies on Central Asia*. Palgrave Macmillan, Singapore. https://doi.org/10.1007/978-981-19-4328-7_5
- Kovaleva, I., & Taylor, L. (2023a). Why do women work harder than men? Testing the patrilocal hypothesis. *Qualitative Primary Care*, 31, 31. <https://doi.org/10.36648/1479-1064.23.31.31>
- Kovaleva, I. (2023b). Gender wage gap and income inequality in Kyrgyzstan. In *Proceedings of the 20th KIMEP International Research Conference* (pp. 500-509). <https://www.kimep.kz/about/files/2024/10/KIRC-2023-Proceedings-Final-Aug-29.pdf>
- Kovaleva, I., Taylor, L., Pech, G., & Madumarov, E. (2025a). What household structure encourages innovation? Comparative analysis of a case study of female labor in Kyrgyzstan and Kazakhstan. *Buketov Business Review*, 11730(1), 30-42. <https://doi.org/10.31489/2025ec1/30-42>
- Kovaleva, I., Taylor, L., Korosteleva, A., & Kudebayeva, A. (2025b). More freedom, less equality: The unexpected economics of abortion in Central Asia. *Eurasian Journal of Economic and Business Studies*, 69(3), 125-139. <https://doi.org/10.47703/ejeb.v69i3.547>
- Kovaleva, I., Taylor, L., Pech, G., Madumarov, E., & Korosteleva, A. (2025c). From household duties to innovation: The role of gender norms in women's economic participation. *Buketov Business Review*, 11830(2), 41-53. <https://doi.org/10.31489/2025ec2/41-53>
- Lomia, N., Berdzuli, N., Pestvenidze, E., Sturua, L., Sharashidze, N., Kereselidze, M., ... Stray-Pedersen, A. (2020). Socio-Demographic Determinants of Mortality from Chronic Noncommunicable Diseases in Women of Reproductive Age in the Republic of Georgia: Evidence from the National Reproductive Age Mortality Study (2014). *International Journal of Women's Health*, 12, 89-105. <https://doi.org/10.2147/IJWH.S235755>
- Nazridod, S., Pereira, C. P. da C., & Guerreiro, M. das D. H. (2019). Adolescents who stay, parents who migrate: gender inequalities, resilience and coping strategies in Tajikistan. *Journal of Ethnic and Migration Studies*, 47(7), 1613-1630. <https://doi.org/10.1080/1369183X.2019.1662716>
- Samatova, Z., Porter, D., & Kovaleva, I. (2025). Analyzing the impact of AI on job reallocation: A bibliometric perspective on lost and emerging careers (2010-2025): A bibliometric perspective

on lost and emerging careers (2010-2025). *Buketov Business Review*, 11930(3), 30-46.
<https://doi.org/10.31489/2025ec3/1169>

Temirtayeva, M. M., Kovaleva, I. V., & Kudabayeva, A. K. (2025). Gender gaps in school education: A two-decade bibliometric analysis. *Qainar Journal of Social Science*, 4(1), 53-76.
<https://doi.org/10.58732/2958-7212-2025-1-53-76>

Trevisani, T. (2021). Restructuring marriage and family in industrial Kazakhstan: Axes of inequality and conjugality in a former Soviet steel plant. *Oriente Moderno*, 100(2), 200-224. Retrieved from
https://brill.com/view/journals/oromo/100/2/article-p200_4.xml

The Impact of Electronic Financial Services on the Profitability of the Banking Sector in Kosovo

Besmir Çollaku  ¹

¹PhD Student, Faculty of Economics,
Department of Banking, Finance and
Accounting, University of Prishtina
"Hasan Prishtina", Prishtina, Kosovo

✉ **Corresponding author:**
besmir.collaku@uni-pr.edu



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study investigates the impact of electronic financial services on the profitability of the banking sector in Kosovo. The investigation is based on the premise that adopting electronic channels enhances operational efficiency, reduces transaction costs, and supports the diversification of revenue sources. A quantitative approach is employed, using monthly time-series data. An index of electronic financial services is constructed from Google Trends, while other indexes capture key dimensions of bank performance. Principal Component Analysis (PCA) is applied to develop the indexes, and their impact on profitability is estimated using Ordinary Least Squares (OLS) regression. The findings indicate that electronic financial services, liquidity, and GDP positively affect bank profitability, while risk negatively affects it. In contrast, market share and loan portfolio size are statistically insignificant. These results offer practical insights for banks and policymakers, highlighting the benefits of investing in electronic capabilities, promoting customer adoption, and safely expanding digital services. By providing a novel assessment of electronic financial services in Kosovo's transitional banking environment, this study contributes to the broader literature on digital finance and bank performance.

KEYWORDS: Profitability, e-financial services, bank efficiency, banking sector, Kosovo.

How to cite: Çollaku, B. (2025). The Impact of Electronic Financial Services on the Profitability of the Banking Sector in Kosovo. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 109-117). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17432803>

Introduction

Technological innovation has become a key driver of change in the global banking industry. Electronic financial services (e-financial services), such as online banking, mobile applications, digital payments, and electronic lending platforms, have transformed how banks deliver services, interact with customers, and generate income. These services reduce transaction costs, provide 24/7 access, and create new revenue channels, thereby positively impacting bank profitability (Carbo-Valverde, 2017; Deloitte, 2018).

Traditionally, banks relied on interest income from lending, with operating models remaining unchanged for decades. The 2008 global financial crisis exposed the limitations of these models, prompting banks to pursue more stable and diversified sources of profit. Research indicates that electronic financial channels lower costs, expand access, and increase fee-based income, enhancing profitability through efficiency gains (Angor et al., 2019; Al-Khayyat et al., 2025).

Kosovo stands for a unique case of this transformation. Since the early 2000s, its banking sector has expanded rapidly and increasingly adopted electronic channels to align with international standards (Mazreku et al., 2016; Mustafa et al., 2005). The number of ATMs, POS terminals, and e-banking accounts has grown substantially. Mobile banking has emerged as the primary transaction channel, and integration with Google Pay and Apple Pay positions Kosovo alongside European digital banking standards (CBK, 2024_a; CBK, 2025).

Despite these advancements, the intensity and sustainability of the impact of e-financial services on bank profitability in Kosovo remain underexplored. Most existing research focuses on developed banking systems, leaving transitional economies underrepresented (Hernando and Nieto, 2007; Lee and Ngo, 2020; Lee et al., 2021). While banks in Kosovo have adopted electronic channels to expand services and maintain competitiveness, the financial benefits have not yet been systematically quantified.

This research gap presents both theoretical and practical implications. Academically, it limits understanding of how e-financial services influence bank profitability in transitional economies. Practically, managers and regulators require empirical evidence to guide digital strategies that foster sustainable profit growth.

Research Aim and Research Questions

The primary aim of this study is to investigate the impact of electronic financial services (e-financial services) on the profitability of banks in Kosovo, with particular attention to cost efficiency, process automation, and customer outreach. The study aims to provide systematic evidence on how digital financial channels influence bank performance in a transitional economy.

To achieve this aim, the study addresses the following research question:

RQ: Do electronic financial services positively impact bank profitability in Kosovo, and if so, to what extent?

Based on this research question, the following hypothesis is formulated:

H₁: Electronic financial services have a positive impact on the profitability of banks in Kosovo.

This hypothesis is grounded in the assumption that e-financial services enhance profitability by reducing operating expenses, streamlining internal processes, and expanding customer reach.

The magnitude of this impact is expected to vary depending on the level of client adoption and the effectiveness of integrating these services into banks' business models.

The findings of this study are intended to advance academic understanding and provide practical guidance for banking professionals and regulators, supporting the design of digital strategies that improve efficiency, improve customer engagement, and enhance overall financial performance.

Research Methodology

This study examines the impact of electronic financial services (e-financial services) on bank profitability using econometric analysis of monthly time-series data from August 2010 to December 2024. The data were collected from the Central Bank of Kosovo, the Kosovo Agency of Statistics, and the International Monetary Fund.

Ordinary Least Squares (OLS) regression was employed, with the profitability index as the dependent variable. The independent variables include indexes of liquidity, risk, growth, credit, and e-financial services, while the logarithm of GDP (ln_GDP) is included as a control variable.

To construct the composite indexes, Principal Component Analysis (PCA) was applied. The adequacy and suitability of the dataset were assessed using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test (Mazziotta and Pareto, 2016; Boudt et al., 2022). Table 1 summarizes the components and purpose of each index.

Table 1

Composite Indexes

Index	Components	Description / Purpose
Profitability Index (Pi)	- Return on Assets, - Net Profit Before Tax, - Net Profit After Tax, - Net Profit, - Invers Cost/Income	Captures overall bank profitability, combining efficiency and performance
Liquidity Index (Li)	- Loan-to-Deposit Ratio, - Liquidity Ratio, - New Loans / New Deposits	Measures the liquidity position of banks
Risk Index (Ri)	- Non-Performing Loan, - Capital Adequacy Ratio, - Tier 1 Capital Ratio	Assesses bank risk, credit risk management, and stability
Growth Index (Gi)	- Deposit Growth Rate, - Total Asset Growth Rate	Captures the growth dynamics of the bank
Credit Index (Ci)	- Loan Growth Rate, - New Loans / New Deposits	Measures the expansion and management of bank credit
Macroeconomic Control (ln_GDP)	Logarithm of GDP	Controls of the overall economic environment

Source: Author's compilation based on Rekik and Kalai (2018), Borroni and Rossi (2019), Bod'a et al. (2021), Dong et al. (2020), and Nguyen (2021).

Among these, the e-financial services index is central to this study. It is constructed from monthly Google Trends search data and synthesised using PCA (Dong et al., 2020; Nguyen, 2021). Table 2 outlines the method for constructing the e-financial services index.

Table 2

Calculation Process of the e-Financial Services Index

Step	Description	Source / Notes
Foundation Lexicon	Seven keywords selected based on banking functions: digital payments, P2P lending, online investment platforms, robo-advisors, cybersecurity, RegTech, omnichannel services	Reflects payments, credit allocation, investment, and network channels
Keyword Frequency	Monthly search frequency obtained from Google Trends as a proxy for public interest and adoption	Used to measure digital activity in banking
Screening Keywords	Search frequencies standardized and assessed for correlation with overall bank performance	Only strongly correlated keywords kept for the index
Index Integration	Factor analysis applied to synthesize selected keywords into a single EFi index	Captures overall adoption and activity of digital financial services

Source: Author's compilation based on Dong et al. (2020) and Nguyen (2021).

The impact of e-financial services on bank profitability is estimated using OLS regression. This method is widely employed in banking and finance research due to its robustness in time-series analysis (Di Febo and Angelini, 2022; Dong et al., 2020).

The functional form of the profitability model is expressed as:

$$Pi_t = f(Li_{t-1}, Ri_{t-1}, Gi_{t-1}, Ci_{t-1}, EFi_{t-1}, \ln_BPV_{t-1})$$

In its linear specification, the OLS model is written as:

$$Pi_t = \beta_0 + \beta_1 x Li_{t-1} + \beta_2 x Ri_{t-1} + \beta_3 x Gi_{t-1} + \beta_4 x Ci_{t-1} + \beta_5 x EFi_{t-1} + \beta_6 x \ln_BPV_{t-1} + \varepsilon_t$$

Where:

- Pi_t - profitability of the banking sector at time t (dependent variable). Li_{t-1} , Ri_{t-1} , Gi_{t-1} , Ci_{t-1} , EFi_{t-1} , and $\ln_BPV_{t-1}$, lagged independent variables capturing liquidity, risk, growth, credit, e-financial services, and bank performance volume, respectively.
- β_0 - intercept term,
- β_1 – β_6 slope coefficients measuring the marginal impact of each independent variable on profitability.
- ε_t - error term, accounting for unobserved factors not included in the model.

Research Results

This section presents the descriptive statistics, correlation analysis, diagnostic checks, and regression results used to evaluate the impact of electronic financial services (EFi) on bank profitability in Kosovo.

To ensure comparability across variables, all indices were standardised to a common scale before analysis. Table 3 reports the descriptive statistics of the dependent variable (Profitability, Pi), lagged explanatory variables, and the control variable ($\ln_GDP$).

Table 3

Descriptive statistics of variables

Variable type	Symbol	Sample size	Std. Dev.	Min	Max	Mean
Dependent variable	Pi	172	1.00171	-2.47	2.03	.0037
Explanatory variables	Li_{t-1}	172	1.00063	-2.25	2.12	.0051
	Ri_{t-1}	172	1.00218	-1.38	2.37	.0029
	Gi_{t-1}	172	.93970	-2.00	2.86	.0000
	Ci_{t-1}	172	.99573	-2.38	2.62	-.0070
	EFi_{t-1}	172	.99251	-1.37	2.43	-.0109
Control variable	ln_GDP_{t-1}	172	.29379	12.47	13.84	13.1888

Note: Variables with (t-1) represent the first lag

Source: Author's calculations

Profitability shows a mean near zero and fluctuates between -2.47 and 2.03, reflecting alternating periods of gains and losses. Lagged explanatory variables – liquidity (Li), risk (Ri), growth (Gi), credit (Ci), and electronic financial services (EFi) also fluctuate around zero, indicating dynamic sector conditions. The credit index shows a slight overall contraction, while the EFi index captures the gradual adoption of digital banking services. The control variable ln_GDP remains stable, suggesting that temporal variations in sector performance primarily reflect banking activity and digital transformation rather than macroeconomic volatility.

Correlation Analysis

Pearson correlation coefficients were calculated to detect potential multicollinearity. Profitability is strongly and positively correlated with EFi ($r = 0.825$, $p < 0.01$) and ln_GDP ($r = 0.843$, $p < 0.01$), showing that higher digital adoption and favourable macroeconomic conditions are associated with greater profitability. Conversely, profitability is strongly negatively correlated with risk (Ri; $r = -0.666$, $p < 0.01$), suggesting that greater risk exposure reduces profitability. Correlations with liquidity (Li; $r = -0.091$), growth (Gi; $r = 0.065$), and credit (Ci; $r = 0.116$) are weak and statistically insignificant, suggesting limited direct effects during the observed period.

Regression Analysis

To test the study hypothesis and quantify the impact of electronic financial services on profitability, an Ordinary Least Squares (OLS) regression model was employed. OLS is appropriate for time-series analysis and widely used in banking research (Onay and Özsöz, 2013; Dong et al., 2020; Di Febo and Angelini, 2022).

Before analysing the regression results, a set of diagnostic tests was conducted to ensure model validity and stability. Multicollinearity was assessed using the Variance Inflation Factor (VIF), with all variables below the threshold of 5, indicating no serious multicollinearity. The normality of the residuals was evaluated using the Jarque-Bera statistic (0.0741), which confirmed normality. Heteroskedasticity was assessed using the Breusch-Pagan test (0.1766) and was not detected. Autocorrelation was evaluated with the Durbin-Watson statistic (1.378), which indicated no significant issues. Overall, these diagnostic results confirm that the regression model meets the main OLS assumptions and is suitable for further analysis.

The regression model demonstrates strong explanatory power: $R = 0.907$, $R^2 = 0.823$, adjusted $R^2 = 0.816$, indicating that over 80% of the variation in profitability is explained by the included variables. variation statistically significant ($F = 126.954$, $p < 0.001$), confirming that the regressors collectively account for profitability vain profitability

Table 4

Regression coefficients for the profitability model

Variable	Coefficient B	Std. Error	t	Sig.	95% CI Lower	95% CI Upper
Constant	-26.2136	3.015	-8.695	0.000	-32.166	-20.261
L1 Li	0.0911	0.035	2.638	0.009	0.023	0.159
L1 Ri	-0.2982	0.042	-7.148	0.000	-0.381	-0.216
L1 Gi	-0.0601	0.038	-1.588	0.114	-0.135	0.015
L1 Ci	-0.0653	0.035	-1.867	0.064	-0.134	0.004
L1 EFi	0.1839	0.071	2.576	0.011	0.043	0.325
L1_GDP	1.9880	0.229	8.700	0.000	1.537	2.439

Source: Author's calculations

The regression results indicate that bank profitability (P_i) is explained by lagged liquidity (Li), risk (Ri), economic growth (Gi), the credit/loan portfolio (Ci), electronic financial services (EFi), and macroeconomic activity (GDP). Liquidity (Li ; $B = 0.091$, $p < 0.01$) and electronic financial services (EFi ; $B = 0.184$, $p < 0.05$) exhibit positive, statistically significant effects, suggesting that higher liquidity and greater adoption of electronic financial services enhance bank performance. In contrast, risk (Ri ; $B = -0.298$, $p < 0.01$) exerts a significant negative impact, confirming that increased risk reduces profitability. Growth/market share (Gi ; $B = -0.060$, $p = 0.114$) and the credit/loan portfolio (Ci ; $B = -0.065$, $p = 0.064$) display weaker negative effects, indicating limited influence during the observed period. Macroeconomic activity (GDP ; $B = 1.988$, $p < 0.01$) has a highly significant positive impact, highlighting the critical role of broader economic conditions.

These findings confirm that electronic financial services positively influence bank profitability in Kosovo. Incremental increases in the EFi index are associated with measurable improvements, with a one-point rise in the EFi index corresponding to a 0.18-point increase in profitability. The benefits of electronic financial services adoption are amplified under favourable macroeconomic conditions, while elevated credit and operational risks diminish profitability, emphasising the need for effective risk management and liquidity strategies (Psaila, 2019; Tölö, 2021).

Regional evidence corroborates these results. Studies in Albania, North Macedonia, and Serbia show similar positive relationships, with improvements occurring gradually (Topalli dhe Molishti, 2025). In advanced European markets, the effects are stronger due to higher digital maturity and supportive regulatory frameworks (Carbo-Valverde, 2017). Other factors, including loan quality, interest rates, and credit volumes, further shape profitability outcomes (Qehaja-Keka et al., 2023). Overall, these results suggest that electronic financial services are increasingly central to performance in Kosovo's banking sector, extending beyond operational efficiency to reshape competition and sustain profits in a small but digitally evolving economy (Cucinelli, 2013; Di Febo and Angelini, 2022).

Conclusions

This study demonstrates that electronic financial services have a positive, statistically significant impact on the profitability of Kosovo's banking sector. Digital channels—including mobile banking, online platforms, and ATMs—enable banks to reduce operational costs, enhance efficiency, and expand their customer base. Profitability is maximised when these services are integrated with sound liquidity management and effective risk control measures. Furthermore, broader macroeconomic conditions play a pivotal role: GDP growth supports higher returns, while elevated credit and operational risks diminish profitability.

The findings have practical and policy implications. First, the Central Bank of Kosovo should foster a supportive yet secure regulatory environment for electronic banking. Clear frameworks governing data protection, cybersecurity, and licensing of electronic financial products will allow banks to innovate while mitigating systemic risks. Second, banks should recognise electronic financial services as strategic drivers of sustainable profitability rather than solely operational tools. Achieving this requires continued investment in technology, robust fraud detection, advanced cybersecurity measures, and real-time monitoring of liquidity flows.

Third, access to electronic financial services should be broad. Offering simple, low-cost, and user-friendly products in local languages can enhance financial inclusion, strengthen customer trust, and expand the deposit base. Finally, partnerships with regional and international providers, along with shared infrastructure for electronic identity verification and credit information, can reduce costs and improve risk management. Continuous monitoring of key indicators linking the use of electronic financial services to profitability will enable both regulators and banks to align strategy, investment, and risk mitigation effectively.

References

- Al-Khayyat, Y. T. M., Al-Husseini, B. I. H., Mohammed, M. J., & Sharaf, H. K. (2025). The influence of the global financial crisis on the bank's profitability: A spatial analysis. *Risk Governance & Control: Financial Markets & Institutions*, 15(1), 110–118. <https://doi.org/10.22495/rgcv15i1p11>
- Angor, G., Aristei, D., & Gallo, M. (2019). Determinants of banks' net interest margin: Evidence from the Euro area during the crisis and post-crisis period. *Sustainability*, 11(14), 3785. <https://doi.org/10.3390/su11143785>
- Bod'a, M., & Zimková, E. (2021). Overcoming the loan-to-deposit ratio by a financial intermediation measure: A perspective instrument of financial stability policy. *Journal of Policy Modelling*, 43(5), 1051–1069. <https://doi.org/10.1016/j.jpolmod.2021.03.012>
- Borroni, M., & Rossi, S. P. (2019). Bank profitability: Measures and determinants. In *Banking in Europe: The quest for profitability after the Great Financial Crisis* (pp. 1–23). Palgrave Pivo. https://doi.org/10.1007/978-3-030-15013-6_2
- Boudt, K., Croux, C., & Dehon, C. (2022). Interpretability of composite indicators based on principal components. *Journal of Probability and Statistics*, 2022, 1–10. <https://doi.org/10.1155/2022/4155384>

- Carbo-Valverde, S. (2017). Digital financial services: A global perspective. *Financial Markets, Institutions & Instruments*, 26(4), 223-238. <https://doi.org/10.1111/fmii.12092>
- Central Bank of the Republic of Kosovo. (2024a). *Statement of MFIs' revenues/time series* [Statistical report]. <https://bqk-kos.org/?id=107>
- Central Bank of the Republic of Kosovo. (2025). *Financial stability report* (No. 21). https://bqk-kos.org/wp-content/uploads/2025/08/CBK_FSR_21.pdf
- Cucinelli, D. (2013). The determinants of bank liquidity risk within the context of the Euro area. *Risk Governance & Control: Financial Markets & Institutions*, 3(3), 42-50. <https://doi.org/10.22495/rgcv3i3art5>
- Deloitte. (2018). *Dancing with disruption: Have you mastered the steps?* Deloitte.
- Di Febo, E., & Angelini, E. (2022). Internet banking, age, gender, and performance: Which connections in Italy? *Bank i Kredyt*, 53(3), 295-324. <https://ideas.repec.org/a/nbp/nbpbik/v53y2022i3p295-324.html>
- Dong, J., Yin, L., Liu, X., Hu, M., Li, X., & Liu, L. (2020). Impact of internet finance on the performance of commercial banks in China. *International Review of Financial Analysis*, 72, 101579. <https://doi.org/10.1016/j.irfa.2020.101579>
- Hernando, I., & Nieto, M. J. (2007). Is the Internet delivery channel changing banks' performance? The case of Spanish banks. *Journal of Banking & Finance*, 31(4), 1083-1099. <https://doi.org/10.1016/j.jbankfin.2006.10.011>
- Lee, C. C., & Ngo, T. (2020). The determinants of bank profitability: A cross-country analysis. *Central Bank Review*, 20(2), 65-73. <https://doi.org/10.1016/j.cbrev.2020.04.001>
- Lee, J., Lee, H., & Lee, J. (2021). Does fintech innovation improve bank efficiency? Evidence from China's banking industry. *International Review of Economics & Finance*, 74, 468-483. <https://doi.org/10.1016/j.iref.2021.03.009>
- Mazziotta, M., & Pareto, A. (2016). On the construction of composite indices by principal components analysis. *Rivista Italiana di Economia Demografia e Statistica*, 70(2), 103-109.
- Nguyen, T. T. H. (2021). Measuring financial inclusion: A composite FI index for the developing countries. *Journal of Economics and Development*, 23(1), 204-222. <https://doi.org/10.1108/JED-03-2020-0027>
- Onay, C., & Özsöz, E. (2013). The impact of internet banking on brick-and-mortar branches: The case of Turkey. *Journal of Financial Services Research*, 44(2), 187-204. <https://doi.org/10.1007/s10693-011-0124-9>
- Psaila, A. (2019). The impact of non-performing loans on the profitability of listed commercial banks in the Euro-Mediterranean area (2013-2017). *International Journal of Economics, Business and Accounting Research*, 3(2), 166-196. <https://doi.org/10.35808/ijeba/338>

- Qehaja-Keka, M., Keka, M., & Gashi, P. (2023). Bank profitability determinants: Evidence from Kosovo and Albania. *Journal of Liberty and International Affairs*, 9(1), 297–311. <https://doi.org/10.47305/JLIA2392370qk>
- Rekik, Y., & Kalai, N. B. (2018). Determinants of banks' profitability and efficiency: Empirical evidence from a sample of banking systems. *Journal of Banking and Financial Economics*, 2(1), 5–23.
- Tölö, E. (2021). How much do non-performing loans hinder loan growth in Europe? *European Economic Review*, 133, 103681. <https://doi.org/10.1016/j.euroecorev.2021.103773>
- Topalli, A., & Molishti, V. (2025, March 20). Digital transformation of the Albanian banking system: The results of the Albanian banking sector digitalization survey 2024. *SUERF Policy Notes and Briefs*. <https://www.suerf.org>

Revocation of the Mandate as a Participatory Governance Tool to Strengthen the Quality of Local Government in Hidalgo, Mexico

Luis Gerardo González Gordillo¹

¹ Maestro en Dirección de Organizaciones, profesor de asignatura en Universidad Vizcaya de las Américas campus Tulancingo, Hidalgo, México

✉ Corresponding
shafa.aliyev@sdu.edu.az

author:



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study examines citizens' knowledge and perceptions of the revocation of the mandate as a participatory governance mechanism to strengthen the quality of local government in Hidalgo, Mexico. Using a quantitative, exploratory approach and a non-experimental, cross-sectional, descriptive design, a questionnaire was administered to a representative sample of 384 individuals aged 18 and over. The results show that, while most respondents have a basic understanding and a positive perception of the mandate's revocation, a significant portion remains uninformed or holds neutral views. The findings highlight that the effectiveness of this mechanism depends on adequate dissemination of the legal framework and civic education to promote informed citizen participation. The revocation of the mandate is perceived as a legitimate tool to enhance accountability and improve local public management. This study underscores the importance of strengthening information channels so that the revocation of the mandate can effectively function as an instrument of direct democracy and participatory governance in Hidalgo, particularly in anticipation of the potential state-level process planned for 2026.

KEYWORDS: Revocation of the mandate, participatory governance, quality of local government, citizen participation, Hidalgo, accountability, direct democracy, civic education.

How to cite: Gordillo, L. G. G. (2025). Revocation of the Mandate as a Participatory Governance Tool to Strengthen the Quality of Local Government in Hidalgo, Mexico. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 118-127). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17473556>

Introducción

En las últimas décadas, diversos estudios han señalado que la gobernanza participativa ha sido promovida como un componente clave para mejorar la legitimidad, la responsabilidad y la calidad del gobierno local (Sánchez, 2023; Santos, 2014). En palabras de Escamilla y Cuna (2021), la participación ciudadana se entiende como la implicación activa de los ciudadanos en la toma de decisiones o en el control de quienes gobiernan. Esta se conecta estrechamente con mecanismos de democracia directa, tales como la revocación de mandato, los referéndums, las consultas populares e iniciativas ciudadanas, por mencionar algunos (González, 2022).

Entre estos mecanismos, la revocación de mandato destaca por su potencial para fortalecer la participación ciudadana y la rendición de cuentas. Se trata de un instrumento institucional que permite a la ciudadanía destituir anticipadamente a un servidor público electo cuando se considera que su gestión no cumple con lo prometido o que ha perdido la confianza ciudadana (Calderón, 2022). Desde 2019, México incorporó legalmente esta figura en su marco jurídico, tanto a nivel federal como en distintas entidades federativas, conforme a la legislación correspondiente. Esta incorporación posiciona al país entre los pocos en América Latina que han formalizado este mecanismo en sus sistemas democráticos (Escamilla y Cuna, 2020). De acuerdo con el Instituto Nacional Electoral (INE, 2022), la primera aplicación a nivel nacional se realizó en 2022, lo que evidencia su potencial para fortalecer la democracia directa mediante la participación ciudadana. En el ámbito estatal, específicamente en Hidalgo, el Instituto Estatal Electoral (IEEH) es el órgano encargado de organizar y supervisar este procedimiento, conforme a lo establecido en la Ley de Revocación de Mandato del Estado (LRMH, 2023).

Estudios recientes han revelado que, si bien existe cierto nivel de conciencia sobre su existencia, también persisten importantes vacíos en la comprensión del marco normativo, de los requisitos y del alcance real del mecanismo (Escamilla y Cuna, 2021). Asimismo, en relación con la percepción ciudadana, López y Escamilla (2022) coinciden en que este tipo de mecanismos suelen ser valorados positivamente como instrumentos para fortalecer la participación, la rendición de cuentas y mejorar la calidad del gobierno. No obstante, persisten sentimientos de desconfianza hacia las autoridades, dudas sobre la imparcialidad del proceso y preocupaciones respecto a que este mecanismo pueda ser utilizado con fines políticos o carecer de consecuencias reales.

El diseño institucional de los mecanismos de participación también influye de manera significativa en la percepción de su legitimidad. La legislación, los requisitos formales, los umbrales de participación, los plazos, los recursos disponibles y la imparcialidad en la difusión de la información son factores que inciden directamente en cómo la ciudadanía evalúa estos procesos (Legorreta y Ramírez, 2022).

Aunque existen investigaciones a nivel nacional y comparativo, son escasos los estudios enfocados en contextos estatales o municipales específicos, como el de Hidalgo. Las estructuras

institucionales, las condiciones sociales, el nivel de información ciudadana, la cultura participativa y las dinámicas políticas varían significativamente entre entidades, por lo que resulta necesario examinar cómo se conoce este mecanismo en Hidalgo, qué percepción tiene la ciudadanía sobre su impacto y qué tan viable resulta que contribuya al fortalecimiento del gobierno local.

Se presume que en Hidalgo muchos ciudadanos tienen un conocimiento limitado sobre qué es la revocación de mandato, cuáles son sus requisitos legales, cuándo puede ejercerse y qué implicaciones tiene. Esta falta de información puede debilitar la percepción positiva del mecanismo, reducir su legitimidad, generar apatía política o permitir su uso con fines partidistas, lo que aleja de su función como herramienta genuina de control ciudadano.

Aunque la legislación federal y estatal ha establecido condiciones, umbrales y plazos claros para la revocación de mandato, la manera en que se implementa en la práctica, los canales de información disponibles y la percepción sobre su efectividad en el gobierno local pueden variar según el contexto. Esto resalta la necesidad de abordar el fenómeno desde una perspectiva situada.

Finalmente, cabe destacar la relevancia de esta investigación, ya que, hasta la fecha, ningún estado de la República Mexicana ha llevado a cabo un proceso formal de revocación de mandato a nivel estatal. En este escenario, Hidalgo podría convertirse en la primera entidad en hacerlo, siempre y cuando se cumplan los requisitos establecidos, lo cual podría ocurrir en 2026.

En México, hay estados en donde se puede llevar a cabo este mecanismo de participación ciudadana; tal es el caso del estado de Hidalgo, donde se analizará a las personas mayores de 18 años de edad.

Investigación realizada en Tulancingo de Bravo, Hidalgo, México.

El objetivo de la investigación fue analizar el nivel de conocimiento y la percepción ciudadana sobre la revocación de mandato como mecanismo de gobernanza participativa para fortalecer la calidad del gobierno local en el municipio de Tulancingo de Bravo, Hidalgo, México.

El estudio se desarrolló con un enfoque cuantitativo, basado en el análisis de datos numéricos y en técnicas estadísticas. El alcance fue exploratorio, dado que se trata de un tema poco abordado en el contexto municipal, y se buscó ofrecer una caracterización detallada del conocimiento y de la percepción ciudadana en dicho entorno.

El diseño metodológico fue no experimental y de tipo transeccional descriptivo, ya que no se manipuló ninguna variable y la información se recolectó en un único momento del tiempo, lo que permitió observar el fenómeno tal como ocurre en su contexto natural. Para el análisis de los datos se empleó la técnica de distribución de frecuencias, según Hernández y Mendoza (2018).

La población objetivo estuvo compuesta por los 135.617 habitantes mayores de 18 años registrados en la lista nominal del municipio de Tulancingo de Bravo (Dirección Ejecutiva del Registro

Federal de Electores [DERFE], INE, 2025). A partir de este universo, se seleccionó una muestra de 384 personas, con un nivel de confianza del 95 % y un margen de error del 5 %.

La recolección de datos se realizó mediante la aplicación de un cuestionario estructurado con escala tipo Likert de cinco puntos, diseñado específicamente para medir las variables de conocimiento ciudadano sobre la revocación de mandato y la percepción sobre su impacto en la gobernanza y la calidad del gobierno local, siguiendo la propuesta metodológica de Hernández y Mendoza (2018).

Derivado de la problemática planteada, se formuló la siguiente pregunta central de investigación: ¿Cuál es el nivel de conocimiento y la percepción ciudadana sobre la revocación de mandato como mecanismo de gobernanza participativa para fortalecer la calidad del gobierno local en Hidalgo, México?

Resultados de la investigación

Análisis teórico

Comprender la revocación de mandato como mecanismo de gobernanza participativa implica reconocer su carácter multidimensional en los marcos democráticos contemporáneos. Este estudio se apoya en perspectivas teóricas que destacan la participación ciudadana, la rendición de cuentas, la legitimidad del poder y los modelos actuales de gestión pública local. Desde el enfoque de la democracia participativa, la participación activa de la ciudadanía en la evaluación y la posible destitución de sus representantes constituye una extensión fundamental de los derechos democráticos más allá de los ciclos electorales convencionales. Este mecanismo no solo refuerza la legitimidad institucional, sino que también potencia la capacidad de respuesta de las autoridades electas.

La teoría de la gobernanza, especialmente en su dimensión participativa, propone un modelo de administración pública basado en redes colaborativas entre el Estado y los actores sociales. En este marco, la revocación de mandato no se interpreta únicamente como un recurso electoral extraordinario, sino como parte de una relación constante entre la ciudadanía y el gobierno. Su implementación adecuada puede fortalecer los vínculos de corresponsabilidad y de control social mutuo, consolidando una gobernanza más democrática.

Por su parte, la teoría del control democrático permite comprender este mecanismo como una forma de rendición de cuentas vertical, en la que la ciudadanía supervisa directamente el desempeño de sus representantes. La eficacia del proceso depende de marcos legales bien definidos, del acceso a la información pública, de la capacidad organizativa y de la autonomía de los órganos electorales. Bajo estas condiciones, el control ciudadano puede ejercer una influencia real sobre el poder local.

La teoría de la legitimidad democrática complementa este análisis al señalar que el poder

político solo es aceptable si se percibe como justo en términos de resultados y procedimientos. La revocación de mandato puede aumentar la legitimidad procedimental al institucionalizar la expresión del descontento social. No obstante, su mal uso o la falta de transparencia podría tener el efecto contrario y debilitar la confianza ciudadana. Estas aproximaciones teóricas permiten interpretar que la revocación de mandato es más que una figura legal: constituye una manifestación compleja de la relación entre ciudadanía y poder en el ámbito local.

Revisión de la literatura

Para comprender el papel de la revocación de mandato como herramienta de gobernanza participativa y su impacto en la calidad del gobierno local, es necesario revisar estudios recientes que abordan este mecanismo desde distintas perspectivas. La literatura existente analiza tanto el diseño institucional y normativo como la participación ciudadana, la percepción pública y los retos operativos y administrativos asociados a su implementación. A continuación, se presenta una síntesis de las investigaciones más relevantes realizadas en los últimos cinco años que permiten contextualizar y fundamentar este estudio.

La revocación de mandato ha sido estudiada empíricamente en diversos contextos locales. En las alcaldías de la Ciudad de México, se ha observado que la participación ciudadana puede ser determinante para exigir rendición de cuentas, aunque persisten obstáculos legales y culturales que limitan su efectividad como mecanismo de fortalecimiento de la gobernanza (Guerra y Uriostegui, 2025). Desde un enfoque institucional, se ha destacado la necesidad de contar con normas claras que regulen su activación, los requisitos de convocatoria y los procedimientos de supervisión, con énfasis en cómo estas reglas afectan la legitimidad del mecanismo (López y Escamilla, 2022).

Los estudios comparativos en América Latina han mostrado que el diseño institucional del mecanismo de revocación influye directamente en su eficacia. Diferencias en los umbrales de participación, en los requisitos legales y en la infraestructura administrativa condicionan el impacto real del proceso sobre la calidad democrática (Escamilla y Cuna, 2021). La percepción ciudadana también ha sido abordada mediante metodologías mixtas, lo que revela que, aunque existe una valoración positiva del mecanismo, subsisten dudas respecto a su imparcialidad y al posible uso político que puede darse (González, 2022).

En contextos regionales, los gobiernos subnacionales enfrentan dificultades para integrar herramientas como la revocación de mandato en esquemas de gestión pública orientados al desarrollo. La literatura indica que la falta de institucionalidad, la escasa educación cívica y los escasos recursos operativos debilitan la efectividad de estos mecanismos en los gobiernos locales (Lomas et al., 2023). Desde una perspectiva crítica, también se advierte que la ausencia de seguimiento adecuado o el uso indebido del proceso pueden provocar efectos adversos en la calidad del gobierno (Chávez, 2024).

Un análisis empírico del proceso de revocación presidencial en México en 2022 evidenció que en numerosos estados no se alcanzó el umbral mínimo de participación, lo cual cuestiona la legitimidad del resultado y subraya la importancia de fortalecer la educación cívica para promover una participación más activa y efectiva (Calderón, 2022). En el ámbito internacional, un estudio comparativo entre Ciudad de México y Lima, entre 2014 y 2020, muestra que los mecanismos institucionalizados de participación influyen positivamente en la calidad democrática y en la eficacia del gobierno local. Las diferencias en el diseño institucional explican los niveles de influencia efectiva de la ciudadanía en ambos contextos (Fernández, 2023).

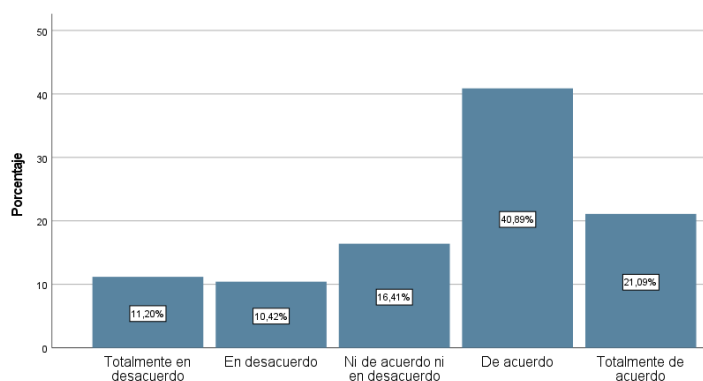
Adicionalmente, se ha documentado que la participación ciudadana activa en los procesos de toma de decisiones locales contribuye a mejorar la cohesión social y la legitimidad institucional. En la Región de Murcia, se identificó que, aunque hombres y mujeres comprenden la participación de manera similar, las mujeres tienden a participar más en espacios informales y enfrentan barreras estructurales para integrarse en los procesos formales. Esto sugiere la necesidad de promover políticas públicas más inclusivas (Clavero et al., 2024).

Por último, investigaciones recientes coinciden en que, si bien la revocación de mandato se valora como un instrumento democrático, su efectividad depende de la confianza pública y de su diseño normativo. Se plantea la necesidad de garantizar la transparencia, reglas claras y la formación ciudadana para evitar que este mecanismo pierda legitimidad o sea utilizado con fines partidistas (Manetto, 2023).

Resultados empíricos

Figura 1

Legislación estatal sobre revocación de mandato



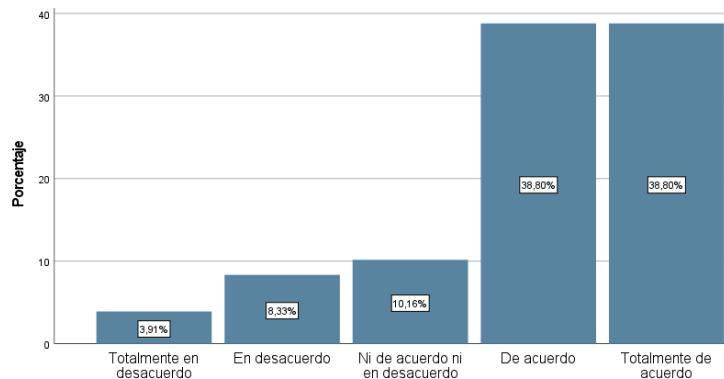
Fuente: Elaboración propia

En la figura 1 se observa que el 61,98 % de los encuestados manifestó estar de acuerdo o totalmente de acuerdo, lo que sugiere una mayoría con una percepción positiva sobre su conocimiento del marco legal. No obstante, el 21,62 % reconoció desconocimiento, mientras que el

16,41 % se mantuvo neutral. Estos datos evidencian que, aunque hay avances en el conocimiento ciudadano, persiste una proporción significativa de personas con poca información. Esto refuerza lo señalado en el marco teórico: la efectividad de la revocación de mandato como herramienta de gobernanza participativa depende del acceso ciudadano a información clara, así como de la adecuada difusión institucional del marco normativo.

Figura 2

Porcentaje de firmas para solicitar revocación

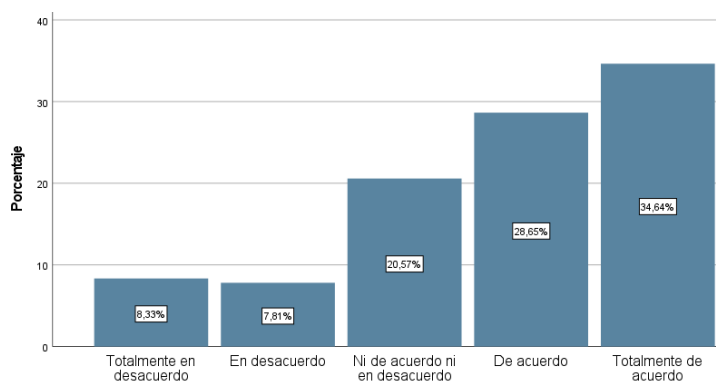


Fuente: Elaboración propia

Con base en la figura 2, se observa que el 77,6 % de las personas encuestadas respondió positivamente, manifestándose de acuerdo (38,80 %) o totalmente de acuerdo (38,80 %). Solo el 12,24 % expresó estar en desacuerdo o totalmente en desacuerdo, mientras que el 10,16 % adoptó una postura neutral. Estos resultados reflejan un nivel significativo de conocimiento de la ciudadanía respecto a este requisito legal, lo cual es clave para la efectividad del mecanismo. Tal como se plantea en el marco teórico, la participación informada es un factor determinante para que la revocación de mandato funcione como una herramienta de control democrático real.

Figura 3

Revocación como mejora del gobierno local



Fuente: Elaboración propia

Los resultados de la figura 3 muestran una percepción mayoritariamente positiva. El 63,29 % de los encuestados se manifestó de acuerdo (28,65 %) o totalmente de acuerdo (34,64 %) con esta afirmación. Un 2,57 % adoptó una postura neutral, mientras que el 1,14 % expresó algún grado de desacuerdo. Estos datos sugieren que, para una parte importante de la ciudadanía, este mecanismo constituye una vía legítima y útil para incentivar un mejor desempeño de las autoridades locales. Además, refuerzan el planteamiento teórico de que la revocación de mandato, cuando es bien conocida e implementada, puede fortalecer la rendición de cuentas y la calidad del gobierno.

Conclusiones

Los resultados de este estudio sobre la revocación de mandato como herramienta de gobernanza participativa para fortalecer la calidad del gobierno local en Hidalgo revelan que, aunque una mayoría de ciudadanos en Tulancingo de Bravo cuenta con un conocimiento básico y una percepción positiva sobre este mecanismo, persiste un segmento considerable con desconocimiento o posturas neutras. Esto indica que, si bien la revocación de mandato se valora como un instrumento legítimo para promover la rendición de cuentas y mejorar la gestión pública local, su efectividad depende del nivel de información y de la difusión adecuada del marco normativo.

La percepción favorable de la posibilidad de que este mecanismo contribuya a la mejora del gobierno local resalta su potencial para impulsar una gobernanza más democrática y participativa en Hidalgo. Sin embargo, para materializar este potencial, es fundamental fortalecer los canales de comunicación y de educación cívica que faciliten una participación ciudadana informada y consciente. Futuras investigaciones deberían abordar las limitaciones sociopolíticas y culturales que dificultan el acceso al conocimiento sobre la revocación de mandato y evaluar el impacto real que su implementación tendrá en la calidad del gobierno local, especialmente ante el posible proceso de revocación previsto para 2026 en la entidad. Estos avances permitirán consolidar la revocación de mandato como un mecanismo eficaz para fortalecer la calidad del gobierno local mediante la participación ciudadana en Hidalgo.

Referencias

- Calderón, M. (2022). Consulta de revocación de mandato en México 2022: sin ley, sin presupuesto y sin participación ciudadana. *Revista Elecciones*, 21(23), 267-278. <https://doi.org/10.53557/Elecciones.2022.v21n23.10>
- Clavero, E., Ortiz, P., y Haz-Gómez, F. (2024). Participación ciudadana en la gobernanza local: el caso de la Región de Murcia. *Áreas. Revista Internacional de Ciencias Sociales*, 46, 97-119. <https://doi.org/10.6018/areas.631241>
- Escamilla, A., y Cuna, E. (2020). La institucionalización de la revocación de mandato en América Latina. *Revista Mexicana de Estudios Electorales (RMEE)*, 9(1), 45-61. <https://rmee.org.mx/index.php/RMEstudiosElectorales/article/view/375>

- Escamilla, A., y Cuna, E. (2021). *La revocación del mandato: reglas de operación, diseños institucionales y su aplicación para México*. RMEE.
<https://rmee.org.mx/index.php/RMEstudiosElectores/article/view/375> Rmee
- Fernández, J. (2023). *Participación ciudadana en la gobernanza local: un estudio de caso de la participación ciudadana institucionalizada en la Ciudad de México y Lima, 2014-2020*. Universidad Nacional Autónoma de México. Recuperado de
<https://hdl.handle.net/20.500.14330/TES01000846854>
- González, F. (2023). *La revocación de mandato en México: análisis jurídico*. JUS. Revista Jurídica. Cuerpo Académico de Derecho Constitucional, 2(11), 98-111.
<https://doi.org/10.5281/zenodo.8293604> Revistas UAS
- González, M. (2022). *Revocación del mandato, percepción ciudadana y desafíos para el fortalecimiento de la democracia participativa en México*. Encrucijada Revista Electrónica del Centro de Estudios en Administración Pública, (42), 195-218.
<https://doi.org/10.22201/fcpys.20071949e.2022.42.82669> Revistas UNAM
- González, M. (2022). *Revocación del mandato, percepción ciudadana y desafíos para el fortalecimiento de la democracia participativa en México*. Encrucijada Revista Electrónica del Centro de Estudios en Administración Pública, (42), 195-218.
<https://doi.org/10.22201/fcpys.20071949e.2022.42.82669>
- Hernández, R. y Mendoza, C (2018). *Metodología de la investigación. Las rutas cuantitativa, cualitativa y mixta*, México: Editorial Mc Graw Hill.
- Instituto Nacional Electoral. (2022). *Resultados de la primera revocación de mandato en México*.
<https://www.ine.mx/revocacion-de-mandato/>
- Legorreta, P. y Ramírez, S. (2022). *Implementación de la revocación de mandato en México*. Instituto Belisario Domínguez.
<http://bibliodigitalibd.senado.gob.mx/handle/123456789/5541> Biblioteca Digital IBD
- Ley de Revocación de Mandato del Estado de Hidalgo. (2023, 22 de agosto). *Periódico Oficial del Estado de Hidalgo*. Instituto Estatal Electoral de Hidalgo será el encargado de organizar, desarrollar y computar la votación del proceso de revocación de mandato.
<https://mexico.justia.com/estatales/hidalgo/leyes/ley-de-revocacion-de-mandato-del-estado-de-hidalgo/> Justia
- López, R. y Escamilla, A. (2022). *La revocación del mandato presidencial en México en 2022: diseño institucional y resultados procesales*. Espiral estudios sobre Estado y sociedad, 32(92).
<https://doi.org/10.32870/eees.v32i92.7337>
- Manetto, F. (2022). El INE replica a López Obrador: "Si hubo un boicot fue de quien no dio el dinero

para instalar todas las casillas". *El País*. <https://elpais.com/mexico/2022-04-11/el-ine-replica-a-lopez-obrador-si-hubo-un-boicot-fue-de-quien-no-dio-el-dinero-para-instalar-todas-las-casillas.html>

- Sánchez, J. (2023). Gobernanza participativa y calidad del gobierno local: un análisis contemporáneo. *Revista de Administración Pública*, 56(2), 145-167.
- Santos, P. (2014). La participación ciudadana en el gobierno local: desafíos y perspectivas. *Estudios Políticos Mexicanos*, 12(34), 89-110.



Management and Utilisation of Digital Data in Vietnam's Natural Resources and Environment Sector: Current Status, Challenges and Solutions

Nguyen Van Bau^{1,2}

¹ University of Social Sciences and Humanities, Ho Chi Minh City, Vietnam

² Vietnam National University, Ho Chi Minh City, Vietnam

Corresponding author:

baunv@hcmussh.edu.vn



This work is licensed under CC BY-NC-ND 4.0.

To view a copy of this license, visit

<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT:

Amid Vietnam's accelerated national digital transformation, digital data play an increasingly pivotal role in managing natural resources, protecting the environment, and promoting sustainable development. This study analyses the current state of digital data systems in Vietnam's Natural Resources and Environment (NRE) sector, identifying key challenges and proposing solutions for more effective data governance. Employing a qualitative approach combined with policy document analysis, the study reveals that the NRE data system remains fragmented, lacks interoperability, standardised technical frameworks, and underutilises its potential for societal benefits. Institutional, technical, and organisational barriers—including bureaucratic data-sharing processes, limited digital capacity among personnel, and inconsistent technological infrastructure—hinder the application of data in environmental monitoring, spatial planning, and evidence-based decision-making. Based on these findings, the study recommends developing a national NRE data strategy, reforming open data policies, enhancing digital workforce capacity, investing in integrated infrastructure, and promoting mechanisms for data utilisation to serve communities and businesses. These proposals aim to establish an efficient, transparent NRE data ecosystem that robustly supports Vietnam's sustainable development goals.

KEYWORDS:

Digital data, Digital transformation, Open data policy.

How to cite: Bau, N. V. (2025). Management and Utilisation of Digital Data in Vietnam's Natural Resources and Environment Sector: Current Status, Challenges and Solutions. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 128-137). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17498707>

Introduction

Climate change has emerged as one of the most critical global challenges of the 21st century, threatening the sustainability of natural, economic, and social systems. In developing countries like Vietnam, where economies still heavily rely on natural resource exploitation, the impacts of extreme weather, ecological degradation, and environmental risks are becoming increasingly complex and difficult to manage. In this context, sustainable development is no longer optional but a strategic national priority, requiring interdisciplinary coordination among economic growth, social equity, and environmental protection.

The Natural Resources and Environment (NRE) sector plays a central role in achieving sustainable development goals through its functions of monitoring, planning, and managing critical resources, including land, water, air, forests, minerals, and coastal areas. However, for resource governance to be effective, proactive, and adaptive, enhancing forecasting, monitoring, and decision-making capabilities must rely on robust data, particularly digital data. In the era of digital transformation, data has evolved beyond a technical tool to become a new form of “strategic asset” for nations, playing an essential role in managing resource dynamics, analysing environmental trends, and formulating policies to adapt to climate change.

Recognising this importance, the Vietnamese government has identified digital transformation as a key driver for sustainable development. According to Decision No. 749/QĐ-TTg of 2020 on the National Digital Transformation Program (Government of Vietnam, 2020), the NRE sector is prioritised for early digitisation to enhance operational efficiency, public service delivery, and rapid response to environmental challenges. However, implementation in Vietnam reveals that the NRE digital data system remains fragmented, lacks synchronisation, and has yet to fully realise its potential to support decision-making and policy planning. Institutional barriers, technical infrastructure limitations, information-sharing mechanisms, and organisational capacity pose significant challenges to modernising the sector’s data systems.

Against this backdrop, this article aims to comprehensively analyse the current state of digital data management and utilisation in Vietnam’s NRE sector while evaluating the role of digital data in supporting decision-making and achieving sustainable development goals. It also identifies key challenges in the sector’s digital transformation process. It proposes practical solutions to enhance data governance efficiency, ultimately contributing to the development of an integrated, transparent, and sustainable NRE information ecosystem in the long term.

Research Aim

This study aims to comprehensively evaluate the management and utilisation of digital data in Vietnam's Natural Resources and Environment (NRE) sector, examining the current status, identifying institutional, technical, and organisational challenges, and proposing practical,

evidence-based solutions to strengthen data governance for sustainable development.

Research Questions

1. What is the current state of digital data systems in Vietnam's NRE sector in terms of interoperability, data accessibility, standardisation, and practical application?
2. What institutional, technical, and organisational barriers hinder the effective management, sharing, and utilisation of NRE digital data at national and local levels?
3. What policy, technological, and capacity-building solutions are needed to develop a more integrated, transparent, and sustainable digital data ecosystem in the NRE sector?

Research Results

Legal and Policy Framework for Digital Data Governance in the Natural Resources and Environment Sector

In recent years, Vietnam's legal and policy framework for digital data governance in the NRE sector has made significant strides, reflecting efforts to establish an institutional framework aligned with digital transformation and the Sustainable Development Goals. At the national level, Decision No. 749/QĐ-TTg (2020) on the National Digital Transformation Program (Government of Vietnam, 2020) clearly outlines the pivotal role of data in building a digital government, economy, and society. The NRE sector is prioritised for digitalisation, with the development and operation of large-scale databases, such as those for land, climate, environment, biodiversity, and remote sensing, emphasised as foundational for state management and climate change response.

Additionally, the National Data Strategy to 2030 aims to establish an open, shared, and interdisciplinary data ecosystem to facilitate information sharing across government levels, ministries, and localities. At the sectoral level, Decree No. 73/2017/ND-CP (Government of Vietnam, 2017) serves as a central legal document regulating the collection, management, and use of NRE data, covering 13 key sectoral data groups. The Environmental Protection Law (National Assembly, 2020) further strengthens the legal basis for developing and operating a national environmental information system, mandating integration and interoperability at all levels, from central to local. Circular 03/2022/TT-BTNMT (Ministry of Natural Resources and Environment, 2022) also plays a critical role in guiding the management and storage of electronic NRE documents, promoting data connectivity with national platforms such as the National Archives. Moreover, the NRE sector's development strategy to 2030, with a vision to 2050, clearly sets the goal of establishing a unified digital database capable of broad sharing and multi-sectoral applications.

However, the current policy framework reveals certain limitations, including a lack of specific

regulations on open data, the absence of unified technical standards for sectoral data, and fragmented information management structures. These shortcomings underscore the need for institutional reforms to ensure the strategic role of digital data in resource management, environmental protection, and sustainable development.

Current State of Digital Data Management in the NRE Sector

The implementation of digital data management in Vietnam's NRE sector has shown notable progress but remains uneven, with significant technical and organisational challenges. Data generation has gradually shifted from manual methods to modern technologies, such as automated monitoring systems, remote sensing, and digital topographic surveys, reflecting efforts to enhance data timeliness and accuracy. However, data classification and standardisation remain limited. The data are often stored in varied formats and do not follow uniform metadata standards, such as the ISO 19115 standard, and are not fully integrated with metadata, which complicates retrieval, sharing, and reuse.

The data storage model remains fragmented, primarily managed independently by sectoral units or localities. Investment in IT infrastructure, such as servers, storage software, and backup systems, is inconsistent, particularly in provinces and remote areas, leading to risks of data loss, limited long-term accessibility, and reduced overall management efficiency.

On a positive note, the Ministry of Natural Resources and Environment has deployed key data platforms like GeoPortal, VnMAPS, and EnviSoft (Northern Centre for Environmental Monitoring, 2023). These tools have begun to enhance real-time data connectivity, access, and support for decision-making. However, their application remains limited, with many systems operating in isolation and not yet integrated with national shared data platforms. The adoption of advanced technologies, such as AI, machine learning, or blockchain, is still in the experimental phase, with no established mechanisms for broader implementation.

Overall, the absence of a comprehensive data governance framework, coupled with inadequate organisational and human resource capacities, poses significant barriers to modernising NRE data systems and limits their role in sustainable development governance.

Utilisation of Digital Data for Sustainable Development

As sustainable development becomes a national strategic priority and a focus of numerous policies, the role of NRE digital data is increasingly recognised as a critical foundation for evidence-based decision-making. Effective data utilisation not only enhances state management efficiency but also fosters innovation, transparency, and climate change adaptation, one of Vietnam's most pressing challenges.

In practice, the NRE sector has made strides in leveraging digital data to support sustainable

development goals, particularly through integrating data into planning, resource monitoring, and environmental risk management. Several localities have implemented spatial data, remote sensing, and digital terrain modelling to assess risks. These include erosion, salinisation, and land degradation, supporting climate change adaptation and sustainable socioeconomic development plans. For instance, provinces in the Mekong Delta, such as Ben Tre, Tra Vinh, and Soc Trang, have actively utilised remote sensing data to map risks and integrate them into land use, dike system, and infrastructure planning for response to sea-level rise.

In major urban centres like Hanoi and Ho Chi Minh City, automated air quality monitoring systems provide real-time data integrated into digital platforms. They are PAMAir and EnviSoft. These tools enable air quality tracking, environmental alerts, and timely adaptation measures for both citizens and policymakers. These applications mark a shift in data's role from purely administrative functions to supporting proactive forecasting and decision-making, aligning with smart environmental governance and sustainable urban development.

However, data utilisation faces significant challenges related to organisational capacity, institutions, and technology. At the local level, data analysis and visualisation capabilities are limited due to a lack of trained personnel in IT, GIS, remote sensing data processing, or environmental modelling. Often, data are collected and stored in raw form without being processed into actionable insights for policy analysis, leading to a scenario where "data exists but cannot be used". This skill gap creates a significant divide between the potential of data systems and their practical realisation.

Moreover, data sharing and access mechanisms lack transparency and consistency within and across various sectors, including transportation, construction, agriculture, and energy. Data are frequently treated as an "internal asset," leading to data silos that hinder interdisciplinary integration and analysis—essential for comprehensive, long-term sustainable development policies. The absence of effective technical and institutional frameworks for data sharing further limits the ability to make decisions based on an integrated information ecosystem.

From a societal perspective, the private sector's role in leveraging NRE data is increasingly acknowledged, particularly in high-tech fields, smart agriculture, real estate, renewable energy, and risk insurance. However, unclear regulations on data access, usage costs, and personal data protection hinder the commercialisation and reuse of data for innovation and green growth. The lack of open, internationally compatible technology platforms also poses challenges for domestic businesses integrating NRE data into digitalised production and operations.

Critically, NRE digital data have not been fully integrated into policy planning and sustainable development impact assessments. Strategic Environmental Assessments (SEA), Environmental Impact Assessments (EIA), and regional or sectoral development plans often fail

to utilise real-time data or integrate socioeconomic indicators. As a result, the resulting policies often lack predictive accuracy and limited verifiability. Modern governance principles, such as evidence-based management, adaptive decision-making, and early risk warnings, require a synchronised, high-quality, and interdisciplinary data system.

In summary, the utilisation of digital data in Vietnam's NRE sector is at a critical transition phase: from passive data models to proactive data governance, from fragmented to interdisciplinary integration, and from purely technical applications to strategic decision-making support. Overcoming existing barriers requires refining the legal framework for open data, investing in synchronised technological infrastructure, establishing transparent data-sharing mechanisms, and, crucially, enhancing human resource capacity in digital data management. Only when NRE data are treated as a strategic asset, managed, accessed, and utilised systematically, can their full potential be realised in advancing sustainable development and comprehensive digital transformation in Vietnam.

Discussion

The management and utilisation of digital data in Vietnam's NRE sector, while showing certain progress, continue to face multifaceted barriers encompassing institutional, technical, organisational, and human resource dimensions. These challenges not only hinder the effective implementation of digital transformation policies but also limit the potential of data to contribute to sustainable development. The following discussion outlines three key groups of issues derived from the research findings.

First, Organisational and Institutional Challenges in Data Governance

A central issue is the lack of uniformity and coordination in digital data management across NRE sector entities. Databases are often developed in a fragmented manner, with each agency (general departments, specialised bureaus, or local authorities) maintaining separate systems, leading to duplication, lack of connectivity, and ineffective integration. Inconsistencies in data formats, metadata standards, and information organisation further prevent datasets from being interoperable, reducing their value for interdisciplinary analysis.

The absence of a flexible, transparent, and efficient data-sharing mechanism remains a significant barrier. Current data-sharing processes are predominantly bureaucratic and manual, ill-suited to the demands of rapid and open access in the digital era. While legal frameworks such as the Environmental Protection Law (National Assembly, 2020) and Decree No. 73/2017/ND-CP (Government of Vietnam, 2017) provide basic guidelines, they lack specific regulations on open data, access rights, and data-sharing obligations among stakeholders. This weakens the ability to coordinate actions on environmental issues, which are inherently interdisciplinary and cross-regional in nature.

Additionally, the organisational structure and workforce for digital data governance are inadequate. Most data management units are embedded within IT or administrative departments that lack specialised expertise in data governance. This hinders the development of comprehensive data architectures, the implementation of data lifecycle models, or the adoption of international standards for storage, security, and integration.

Second, technical and Technological Barriers in Data utilisation

Technological infrastructure is a critical foundation for operationalising and maximising the value of digital data. However, Vietnam's NRE sector infrastructure lacks synchronisation, modernity, and scalability. Data are commonly stored in disparate systems, unable to be integrated or shared through national, interoperable platforms. The absence of automated backup solutions, data redundancy systems, access control mechanisms, or robust cybersecurity measures increases the risks of data loss, leakage, or misuse.

Although the NRE sector has begun adopting digital technologies such as automated monitoring systems, GIS software, and open data portals, their application remains limited to data collection and display. Advanced technologies, such as artificial intelligence (AI), machine learning, big data, and environmental modelling, are still in early experimental stages, largely due to constraints in technological and human resources.

The technical workforce is a particular concern. Most personnel lack formal training in digital technologies, data governance, or cybersecurity. As a result, they rely heavily on external vendors and have limited operational autonomy. The capacity gap between central and local levels further complicates matters, especially as the demand for real-time and multi-source data integration becomes increasingly critical.

Third, limitations in Data Access and Utilisation for Sustainable Development

NRE data holds immense potential to support policy planning, implementation monitoring, and tracking progress toward sustainable development. However, its current utilisation remains limited. High-value datasets, such as topographic maps, climate data, forest information, and water resources, are often restricted to internal government use. In many cases, complex access conditions create barriers for researchers, businesses, and communities. Mechanisms for data licensing, usage fees, or reuse restrictions are not aligned with international open data standards, such as the FAIR principles (European Commission, 2018; European Commission, 2019).

Moreover, digital data are not effectively integrated into management and decision-making tools. Environmental assessments, development planning, and climate adaptation strategies often rely on outdated, non-interactive, or partially digitised data. This compromises the quality of policy inputs, leading to low governance efficiency and limited responsiveness to escalating environmental risks.

There is also a perceptual gap between policymakers and implementers regarding the strategic value of data. When data are viewed as an “internal asset” rather than a “national asset,” incentives for sharing, integration, and utilisation remain limited. Sustainable development, however, demands an open, interdisciplinary, and continuously interactive data ecosystem, which the current NRE data system does not fully support.

In conclusion, the challenges in NRE data governance, technology, and access are fundamental but addressable with a cohesive strategy spanning institutions, technology, and organisational capacity. Overcoming these bottlenecks is a prerequisite for advancing the NRE sector’s digital transformation and enhancing national sustainable development governance amid climate change, rapid urbanisation, and increasing environmental pressures.

Conclusion and Recommendations

This study has comprehensively analysed the role, current state, and potential of digital data in Vietnam’s NRE sector, particularly in the context of the country’s accelerated digital transformation and sustainable development goals. Through document analysis, legal reviews, and expert interviews, the findings confirm that digital data are indispensable for evidence-based decision-making, supporting policy planning, governance, and monitoring related to natural resource management, environmental protection, and climate change response.

The NRE digital data system currently encompasses critical domains, including land, environment, hydrometeorology, coastal areas, and remote sensing. However, its management, exploitation, and utilisation face significant limitations, including fragmented and non-interoperable systems, an incomplete legal framework for open data, access rights, and sharing responsibilities, inconsistent technical standardisation, weak analytical and technological application capacities, and a shortage of specialised data personnel. Consequently, despite its high value, data are underutilised in state governance, research, innovation, and community monitoring.

A notable finding is that NRE data exploitation remains largely confined to internal government use, with researchers, businesses, and citizens facing access barriers. Data-sharing mechanisms are overly bureaucratic, lacking platforms for open, integrated, and real-time interaction, which contradicts international open data principles, such as FAIR. This limits the reuse of data and its value in achieving multi-sectoral, interdisciplinary sustainable development goals.

To fully harness the role of NRE digital data for sustainable development, the following recommendations are proposed:

Refine the Legal and Policy Framework: Develop a national NRE data strategy to provide unified guidance on data creation, storage, sharing, and utilisation. This framework should clearly

define stakeholders' rights and obligations, technical standards for data formats and metadata, tiered access based on data sensitivity, and information security protocols throughout the data lifecycle. Integration with other national data platforms is crucial to create an interoperable ecosystem that supports digital governance and sustainable socioeconomic development.

Establish Specialised Data Governance Units: Create dedicated units within the NRE sector to oversee strategic data management, design sectoral data architectures, enforce format standards, ensure data quality, and coordinate interdisciplinary sharing. These units should move beyond technical operations to play a strategic role in data governance.

Enhance Human Resource Capacity: Prioritise comprehensive, flexible training programs that combine theory and practice to build expertise in big data, AI, cybersecurity, and information system management. A skilled workforce is crucial to the successful implementation of NRE data strategies.

Invest in Technological Infrastructure: Develop integrated data platforms, cloud storage, and international-standard backup and security systems to enhance data exploitation and utilisation. Adopting advanced technologies, such as AI, big data, and blockchain, for resource management, environmental forecasting, and climate monitoring is essential. Integrating NRE data with national databases will facilitate interdisciplinary analysis, optimise decision-making, and enhance public accountability.

Promote Non-Governmental Participation: Encourage the private sector, research institutions, and community involvement in the NRE data ecosystem by expanding access rights, creating transparent data catalogues, simplifying licensing processes, and providing user-friendly data platforms. Integrating data into education, scientific research, planning, policy development, and innovation will amplify its practical value and societal benefits.

The findings affirm that digital data in the NRE sector is a strategic resource, not only supporting state governance but also serving as a foundation for a green, smart, and sustainable economy. Realising this potential requires a comprehensive approach integrating institutions, technology, organisation, and human resources, underpinned by clear direction and long-term investment.

References

Government of Vietnam. (2020). *Decision No. 749/QĐ-TTg dated June 3, 2020 on approving the "National Digital Transformation Program to 2025, with orientation to 2030"*. Hanoi: Government Office.

- Government of Vietnam. (2017). *Decree No. 73/2017/ND-CP on the collection, management, exploitation, and use of natural resources and environmental data (issued June 14, 2017)*. Hanoi: Government Office.
- National Assembly. (2020). *Law No. 72/2020/QH14: Law on Environmental Protection (issued November 17, 2020)*. Hanoi: Government Office.
- Ministry of Natural Resources and Environment. (2022). *Circular No. 03/2022/TT-BTNMT: Technical and Economic Norms for the Collection, Storage, Preservation and Provision of Natural Resources and Environmental Data. (issued February 28, 2017)*. Hanoi: Government Office.
- Northern Center for Environmental Monitoring. (2023). Unified Management of National Environmental Monitoring Data, Retrieved from <https://cem.gov.vn/tin-tuc-moi-truong/quan-ly-thong-nhat-du-lieu-quan-trac-moi-truong-quoc-gia>
- European Commission. (2018). *Turning FAIR into reality: Final report and action plan from the European Commission expert group on FAIR data. Publications Office of the European Union*. Retrieved from <https://op.europa.eu/en/publication-detail/-/publication/7769a148-f1f6-11e8-9982-01aa75ed71a1/language-en>
- European Commission. (2019). *Reflection paper: Towards a sustainable Europe by 2030. Publications Office of the European Union*. Retrieved from http://publications.europa.eu/resource/cellar/d375368c-1a0a-11e9-8d04-01aa75ed71a1.0001.01/DOC_1



Standards for Sustainable Tourism: Insights on Accessibility and Inclusivity

Maria Gianni ^{1*}, Sofia Gkarane², Zacharias Papanikolaou³, Apostolos Goulas⁴, Ilias Tsotsas⁵

¹Operations Management, PhD, Adjunct Lecturer, Hellenic Open University, Greece

²Tourism Marketing, PhD, Adjunct Lecturer and Postdoctoral Researcher, International Hellenic University, Greece

³Agricultural Economics, PhD, Postdoctoral Researcher, Democritus University of Thrace, Greece

⁴Economist, Agricultural Economics, PhD, University of Thessaly, Greece

⁵Economist, Service Design, PhD, International Hellenic University, Greece

✉ **Corresponding author:**

gianni.maria@ac.eap.gr



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study reviews literature and explores the role of the ISO 21902 standard in advancing accessibility, inclusivity, and sustainability within the global tourism sector. It examines how standardisation contributes to removing barriers for travellers with diverse access needs while promoting universal design and responsible governance. The findings highlight the impact of ISO 21902 on harmonising accessibility practices, fostering stakeholder collaboration, and aligning with the United Nations Sustainable Development Goals (SDGs). Moreover, the study discusses the interplay between accessibility, digital innovation, and sustainable tourism development. By positioning accessibility as both a human right and a strategic business imperative, this research underscores that inclusive tourism is essential for achieving long-term social, economic, and environmental sustainability. As this study is based on secondary data, future studies employing surveys or case analyses can evaluate real-world compliance and effectiveness.

KEYWORDS: accessibility, tourism, inclusivity, sustainable business models, standards, SDG.

How to cite: Gianni, M., Gkarane, S., Papanikolaou, Z., Goulas, A., & Tsotsas, I. (2025). Standards for Sustainable Tourism: Insights on Accessibility and Inclusivity. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 138-146). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17509694>

Introduction

Tourism stands as one of the most dynamic sectors of the global economy, responsible for generating approximately one in every eleven jobs worldwide and contributing around 9% of global GDP (UNWTO, 2019). However, despite its economic vitality, the tourism sector continues to face significant challenges in ensuring equal access for all travellers. According to the World Health Organisation (2023), almost 15% of the world's population lives with a disabling condition, and nearly 50% of people over the age of 60 experience some form of functional limitation (UN DESA, 2025).

People with disabilities and other access requirements often encounter physical, sensory, cognitive, and cultural barriers when participating in tourism activities (ISO 21902:2021). Common obstacles include inaccessible transportation systems, poorly designed accommodations, and limited availability of reliable accessibility information. Even when accessible facilities exist, inconsistent standards and terminology across countries lead to confusion and unrealistic visitor expectations (UNWTO, 2016).

Moreover, accessibility extends beyond disability. It encompasses a broader demographic that includes elderly travellers, families with children, people with temporary impairments, and even those facing language or cultural barriers (UNWTO, 2016). Contrary to common misconceptions, accessible tourism is not limited to a small market segment. Studies by the European Commission (GfK & Partners, 2014) indicate that travellers with disabilities tend to travel with two to three companions, amplifying the potential market impact. Furthermore, two-thirds of people with disabilities in developed economies possess the financial means to travel (Bowtell, 2015). Accessible tourism thus represents a loyal and expanding market. As global ageing trends accelerate, with the proportion of people aged 65 and above expected to increase from 9% in 2019 to 16% by 2050 (UN, 2019), the demand for inclusive tourism services will continue to rise. Accessibility, therefore, is not merely an ethical or legal issue; it is a strategic business opportunity that enhances competitiveness and fosters sustainable growth.

Therefore, accessible tourism - also known as "Tourism for All" or "Inclusive Tourism" - is not a niche concept, but rather a holistic approach to ensuring equitable participation for all individuals, regardless of age, gender, or ability (World Committee on Tourism Ethics, 2016). The International Organisation for Standardisation (ISO) has taken major steps toward addressing these inequalities with the publication of "ISO 21902:2021 - Tourism and related services - Accessible tourism for all - Requirements and recommendations". This landmark standard provides a framework for improving accessibility and inclusivity across the tourism value chain, offering practical guidance to governments, tourism operators, and industry stakeholders.

This study examines how ISO 21902 contributes to sustainable tourism through accessibility and inclusivity. It explores the interconnections between universal design, standardisation, stakeholder engagement, and sustainability, arguing that accessibility is both a human right and an economic imperative.

Research Aim and Research Questions

The primary aim of this research is to critically examine the role of international standardisation, with a particular focus on ISO 21902:2021 - Tourism and related services: Accessible tourism for all - Requirements and recommendations, in promoting accessibility, inclusivity, and sustainability within the global tourism sector. The study aims to explore how the adoption of ISO 21902 can bridge existing gaps in accessibility practices, promote a more inclusive tourism value chain, and align with the broader objectives of the United Nations' Sustainable Development Goals (SDGs). Furthermore, the research aims to explore how international standards can serve as a catalyst for innovation, stakeholder collaboration, and responsible governance in tourism development.

To achieve this aim, the study will be guided by the following research questions:

- How does ISO 21902 contribute to enhancing accessibility and inclusivity in tourism services, destinations, and management practices?
- What are the key barriers and enabling factors affecting the implementation of ISO 21902 across different cultural, economic, and regulatory contexts?
- In what ways does the integration of accessibility standards support sustainable tourism, particularly in relation to the SDGs on equality, economic growth, and community development?
- How can digital innovation and complementary ISO frameworks strengthen the impact of ISO 21902 in promoting inclusive and smart tourism ecosystems?

Research Results

Objectives and Scope of ISO 21902

Published in 2021, ISO 21902 is the world's first comprehensive international standard addressing accessibility in tourism. It provides requirements and recommendations for ensuring that tourism facilities, products, and services are accessible to all visitors on an equal basis. The standard encompasses a diverse range of stakeholders, including public authorities, destination management organisations (DMOs), transport providers, accommodation services, tour operators, ICT providers, and end-users (ISO 21902:2021, Clause 3.16).

ISO 21902 emphasises Universal Design, a principle that advocates for environments usable by all people, to the greatest extent possible, without the need for adaptation. By promoting universal design, ISO 21902 ensures that accessibility is integrated into planning, infrastructure, and communication rather than treated as a retrofit or add-on feature.

Dimensions of Accessibility

Accessibility is a multidimensional concept, encompassing physical, informational, communicational, and economic aspects (Stuchlikova & Botlikova, 2021).

- Physical accessibility ensures that buildings, transport systems, and public spaces can be navigated independently by all users.

- Information accessibility focuses on reliable, understandable, and standardised communication about accessibility features.
- Communication accessibility refers to staff behaviour and the quality of interaction with visitors, including the use of inclusive language and assistive technologies.
- Economic accessibility involves providing equitable pricing structures and options across different income levels.

By articulating these dimensions, ISO 21902 provides a holistic framework that integrates design, management, and policy considerations.

Harmonisation and Global Consistency

One of the main challenges in accessible tourism has been the fragmentation of standards across regions. ISO 21902 aims to harmonise these practices and close the gaps between national and regional regulations. The initiative is supported by organisations such as the European Network for Accessible Tourism (ENAT), which promotes collaboration among public authorities, private businesses, and NGOs to advance inclusive tourism globally (ENAT, 2021).

Furthermore, the standard complements other ISO frameworks, such as ISO/IEC 40500:2025 on Web Content Accessibility Guidelines (WCAG 2.2), ensuring that both digital and physical accessibility are addressed within the tourism ecosystem (Laporte et al., 2018). Digitalisation plays a key role in this integration by enabling smart destinations and smart travel facilitation that utilise technology, sustainability, and inclusivity across the visitor journey (UNWTO, 2023).

Accessibility, Sustainability, and Digital Transformation

Sustainable tourism, as defined by the UN Sustainable Development Goals (SDGs), seeks to balance economic growth, social inclusion, and environmental protection (Gkarane et al., 2024). Accessibility contributes directly to SDG 8 (Decent Work and Economic Growth), SDG 10 (Reduced Inequalities), and SDG 11 (Sustainable Cities and Communities). The rise of digital tourism ecosystems offers new opportunities for improving accessibility. Technologies such as smart mobility systems, augmented reality guides, and AI-powered translation tools enhance the accessibility of information and communication for diverse users. According to the UNWTO Goa Roadmap (2023), digitalisation fosters circular tourism approaches and allows destinations to adapt more flexibly to visitors' needs. Moreover, standards such as ISO/IEC 29110 and ISO/IEC 40500 ensure that digital solutions adhere to accessibility principles. Integrating inclusive design guidelines for human-computer interaction (HCI) within tourism platforms enables visitors to interact with systems regardless of their sensory or cognitive abilities (Laporte et al., 2018; Sanchez-Gordon et al., 2019). Thus, the alignment between ISO 21902 and digital accessibility standards reinforces sustainability and user empowerment.

The intersection of Environmental, Social and Governance (ESG) frameworks and inclusivity is an emerging aspect of responsible business practice, particularly in the tourism and hospitality industries. When supported by digital technologies, these frameworks have a multiplier effect (Sklavos et al., 2024). The ESGI concept expands the scope of corporate social responsibility (CSR) by integrating inclusive technologies and highlighting how digital innovation and equitable

design can enhance sustainability and accessibility outcomes (Gidage, 2025; Glushchenko, 2025). Empirical evidence suggests that organisations with robust diversity, equity, and inclusion commitments tend to demonstrate superior ESG performance, particularly in industries with high human capital dependence, high stakeholder visibility, and high innovation intensity (Gidage, 2025).

Stakeholder Engagement and Governance

ISO 21902 defines stakeholders broadly as all entities involved in the accessible tourism value chain, including governments, tourism enterprises, ICT providers, construction firms, and end users (ISO 21902:2021). Effective implementation requires collaboration among these diverse actors. Public administrations must lead by example through legislation and inclusive procurement policies. Meanwhile, private sector players, especially small and medium-sized enterprises (SMEs), must receive training and incentives to integrate accessibility standards into their operations. Nonprofit organisations, such as ENAT and Fundación ONCE, contribute by offering education, certification, and benchmarking systems to promote excellence in accessible tourism.

While standardisation provides a technical foundation, true inclusivity requires a cultural transformation within the tourism industry. Researchers such as Marčėková et al. (2025) argue that accessibility should be viewed not only as an infrastructure issue but also as a matter of social awareness and stakeholder engagement. Employees' attitudes, communication skills, and empathy directly shape visitors' experiences. Thus, training programs such as the EU-funded "New Skills for Customised Accessible Tourism (NewsCAT)" project (2016–2019) are essential to cultivate a culture of inclusion and continuous improvement.

Discussion

The analysis of ISO 21902:2021 and related literature reveals several key insights into how international standards can transform the accessibility landscape in the tourism sector. The findings indicate that while awareness of accessibility has increased significantly within policy and academic circles, its implementation remains uneven across destinations and sectors. ISO 21902 provides a coherent framework for addressing these disparities by defining universal requirements and recommendations for accessible tourism. It bridges existing gaps between fragmented national standards and creates a shared reference for all stakeholders in the tourism value chain.

1. Enhanced Clarity and Consistency in Accessibility Practices

One of the most significant outcomes of ISO 21902 is the standardisation of accessibility terminology and procedures across the tourism sector. Before its introduction, accessibility guidelines varied significantly among countries and regions, resulting in inconsistent service delivery and visitor frustration. ISO 21902 establishes a unified language and structure for evaluating accessibility, ensuring that tourism providers, policymakers, and consumers operate with a common understanding. This harmonisation facilitates transparency and comparability across destinations, empowering travellers to make informed decisions while enabling businesses to adopt measurable and verifiable accessibility benchmarks.

2. Strengthened Stakeholder Collaboration and Policy Alignment

The results indicate that ISO 21902 also promotes multi-stakeholder collaboration as a critical mechanism for sustainable tourism development. By defining stakeholder roles, ranging from public administrations and destination management organisations (DMOs) to private tourism enterprises and ICT providers, the standard fosters shared responsibility and accountability. National and regional governments are encouraged to integrate accessibility criteria into tourism policies and public procurement processes, which collectively account for nearly 20% of global GDP (ISO, 2021). This integration drives the inclusion of Universal Design principles in infrastructure projects and incentivises private sector actors to invest in accessible services and technologies.

3. Economic and Social Impact of Accessible Tourism

Empirical evidence from prior studies supports the notion that accessible tourism represents not a niche market, but a profitable and resilient segment of the industry. According to a report of the World Health Organisation (WHO, 2023), almost 1.3 billion people - around 16% of the global population - experience significant disability. Moreover, research estimates that travellers with disabilities typically journey with two to three companions, multiplying the potential economic benefit (Bowtell, 2015; WHO, 2023). As disabilities are also relevant to ageing, as the proportion of elderly travellers continues to grow - projected to reach 16% of the global population by 2050 - the demand for inclusive tourism offerings will expand accordingly. Thus, ISO 21902 positions accessibility not only as a social right but also as a strategic business opportunity that contributes to the competitiveness and sustainability of destinations.

4. Digital Transformation as a Driver of Accessibility

Another significant result concerns the role of digital innovation in advancing accessible tourism (Tsotsas et al., 2025a,b). Standards such as ISO/IEC 40500 (WCAG 2.2) and ISO/IEC 29110 complement ISO 21902 by ensuring that digital platforms, booking systems, and destination management tools are designed inclusively (Laporte et al., 2018; Sanchez-Gordon et al., 2019). This is particularly important as tourism increasingly relies on digital interfaces for trip planning, service delivery, and post-visit engagement. The emergence of smart destinations, which combine accessibility, sustainability, and digitalisation, illustrates how technology can extend the reach of accessible tourism to a broader audience. Digital solutions, such as adaptive websites, virtual reality previews, and AI-based translation tools, enhance both information and communication accessibility, contributing to more inclusive travel experiences for people with diverse abilities and backgrounds (Papanikolaou et al., 2025).

5. Challenges and Areas for Further Improvement

Despite these advances, several challenges persist. Many tourism providers remain unaware of existing accessibility tools, and in some regions, training and technical capacity are insufficient to effectively meet ISO standards. Additionally, financial constraints, limited data, and varying national regulations continue to impede full adoption. There is also a cultural dimension: achieving genuine inclusivity requires more than compliance—it demands attitudinal change within the tourism workforce and a commitment to continuous learning and empathy in customer service. These findings align with the conclusions of Marčeková et al. (2025), who argue that accessibility should be approached not

merely as an infrastructural concern but as a cultural transformation process embedded in everyday practice.

6. Broader Implications for Sustainable Development

Ultimately, the integration of accessibility within the sustainability agenda underscores ISO 21902's contribution to the United Nations' Sustainable Development Goals (SDGs). Specifically, it advances SDG 8 (Decent Work and Economic Growth), SDG 10 (Reduced Inequalities), and SDG 11 (Sustainable Cities and Communities) by fostering inclusive employment opportunities, equitable mobility, and community-based tourism development. As destinations adopt ISO 21902 and related frameworks, they not only comply with ethical and legal standards but also strengthen their long-term resilience, ensuring that tourism benefits are distributed equitably among all segments of society. In the context of tourism, inclusivity is not just a moral or regulatory objective, but also a strategic asset that can boost competitiveness, adaptability and reputation. Furthermore, communication and technology-driven tourism firms can leverage accessibility and inclusive design principles to achieve ESG leadership. Thus, aligning ISO 21902 with ESG frameworks and inclusivity benchmarking provides a multidimensional pathway for achieving accessible, ethical, and sustainable tourism ecosystems, reinforcing the principle that inclusivity underpins both social justice and long-term business resilience.

Conclusion

The integration of ISO 21902 into global tourism systems marks a significant milestone in advancing accessibility and inclusivity. By promoting universal design, standard harmonisation, and stakeholder collaboration, the standard bridges the gap between social responsibility and economic opportunity. Accessible tourism is no longer a niche initiative but a core component of sustainable tourism development. Taking into consideration the increasingly ageing rates in most developing and developed countries, persons with disabilities represent a significant proportion of the global population. Hence, as the demand for inclusive travel grows, destinations and enterprises that adopt ISO 21902 will not only comply with ethical obligations but also gain a competitive advantage. The future of tourism lies in universal accessibility, where technology, design, and policy converge to create experiences that are welcoming, equitable, and enriching for all.

This study is primarily based on a narrative literature review, which, while valuable for synthesising conceptual frameworks and policy developments, has inherent limitations. The analysis relies on secondary data and existing publications rather than empirical evidence derived from field research or stakeholder engagement. Consequently, the findings reflect theoretical insights and global best practices rather than measurable outcomes of ISO 21902 implementation in specific destinations or organisations. Future research should employ empirical methodologies, such as surveys, interviews, or case studies, to assess how tourism providers, public authorities, and destination management organisations (DMOs) interpret and apply ISO 21902 in practice. Additionally, longitudinal studies could evaluate the effectiveness and compliance of accessibility standards over time, providing actionable insights for policy design, industry adaptation, and inclusive innovation in tourism.

References

- Bowtell, J. (2015). Assessing the value and market attractiveness of the accessible tourism industry in Europe: A focus on major travel and leisure companies. *Journal of Tourism Futures*, 1(3), 203–222. <https://doi.org/10.1108/JTF-03-2015-0012>
- ENAT – European Network for Accessible Tourism. (2021). *Publication of first international standard on accessible tourism for all, led by UNWTO, Fundación ONCE and UNE*. <https://www.accessibletourism.org/?i=enat.en.news.2245>
- GfK & Partners. (2014). *Economic Impact and DTravel demand of Accessible Tourism in the European Commission*.
- Gidage, M. (2025). Exploring the impact of diversity, equity and inclusion on ESG performance: Evidence from Indian organizations. *Benchmarking: An International Journal*, (ahead-of-print). <https://doi.org/10.1108/BIJ-11-2024-1009>
- Gkarane, S., Gianni, M., & Vassiliadis, C. (2024). Running toward sustainability: Exploring off-peak destination resilience through a mixed-methods approach–The case of sporting events. *Sustainability*, 16(2), 576. <https://doi.org/10.3390/su16020576>
- Glushchenko, V. V. (2025). The ESGI concept as the expansion of corporate social responsibility based on the synthesis of inclusive technologies. *Modern Scientific Research and Innovation*, 169(5), 103299. <https://www.elibrary.ru/item.asp?id=82439695>
- International Organization for Standardization. (2021). *ISO 21902:2021 – Tourism and related services: Accessible tourism for all – Requirements and recommendations*.
- International Organization for Standardization / International Electrotechnical Commission. (2025). *ISO/IEC 40500:2025 – Information technology: W3C Web Content Accessibility Guidelines (WCAG) 2.2*.
- Laporte, C. Y., Munoz, M., Miranda, J. M., & O'Connor, R. V. (2018). Applying software engineering standards in very small entities: From startups to grownups. *IEEE Software*, 35(1), 99–103. <https://doi.org/10.1109/MS.2017.4541041>
- Marčeková, R., et al. (2025). Bridging the gap: Toward inclusive tourism in the Banská Bystrica region of Slovakia. *Tourism and Hospitality*, 6(4), 193. <https://doi.org/10.3390/tourhosp6040193>
- Papanikolaou, Z., Goulas, A., Tsotsas, I., & Gkarane, S. (2025). Digital transformation and business model innovation in the post-COVID era: A bibliometric analysis of financial and organizational perspectives. *World Conference on Emerging Science, Innovation and Policy 2025*. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15833595>

- Sanchez-Gordon, S., Sánchez-Gordón, M., Yilmaz, M., & O'Connor, R. V. (2019). Integration of accessibility design patterns with the software implementation process of ISO/IEC 29110. *Journal of Software: Evolution and Process*, 31(6), e1987. <https://doi.org/10.1002/smr.1987>
- Sklavos, G., Theodossiou, G., Papanikolaou, Z., Karelakis, C., & Ragazou, K. (2024). Environmental, social, and governance-based artificial intelligence governance: Digitalizing firms' leadership and human resources management. *Sustainability*, 16(16), 7154. <https://doi.org/10.3390/su16167154>
- Stuchlikova, J., & Botlikova, M. (2021). Information accessibility as a global factor in accessible tourism. *SHS Web of Conferences*, 129, 08019. <https://doi.org/10.1051/shsconf/202112908019>
- Tsotsas, I., Gkarane, S., Papanikolaou, Z., & Goulas, A. (2025b). Artificial intelligence in business innovation: A systematic bibliometric review. *World Conference on Emerging Science, Innovation and Policy 2025*. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15844723>
- Tsotsas, I., Papanikolaou, Z., & Goulas, A. (2025a). Emerging trends in business sustainability: A bibliometric analysis in innovation practices. *International Conference on Next-Generation Innovations and Sustainability 2025*. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15098298>
- United Nations Department of Economic and Social Affairs (UN DESA). (2025). *Ageing and disability*. <https://social.desa.un.org/issues/disability/disability-issues/ageing-and-disability>
- World Tourism Organization (UNWTO). (2016). *Manual on accessible tourism for all: Principles, tools and best practices - Module I: Accessible tourism - Definition and context*. UNWTO. <https://doi.org/10.18111/9789284418077>
- World Tourism Organization (UNWTO). (2023). *Goa roadmap for tourism as a vehicle for achieving the sustainable development goals*.
- World Health Organization (WHO). (2022). *Global report on health equity for persons with disabilities*. WHO.



Assessing Budgetary Performance and Efficiency in Albania's RoadTransport Investments (2013-2023)

Vilma Bilaj¹, Elida Liko²

¹PhD Candidate, Faculty of Economics, University of Tirana, Albania

² Prof. Assoc. Dr., Lecturer, Faculty of Economics, University of Tirana, Albania

✉ **Corresponding author:**
Vilma_bilaj.feutdr@unitir.edu.al



This work is licensed under CC BY-NC-ND 4.0. To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study evaluates the budgetary performance and efficiency of Albania's road transport sector from 2013 to 2023. The objective is to analyse trends in public investment, execution rates, and the sustainability of financial management practices. The analysis is based on official monitoring reports from the Ministry of Finance and the Ministry of Infrastructure and Energy, covering planned and realised expenditures and funding structures. Results show a steady increase in investments and a high average execution rate of 93–94%, reflecting improved fiscal discipline and institutional coordination. However, limited maintenance funding and regional disparities continue to hinder balanced development. The findings underscore the need for a more equitable allocation of resources, stronger maintenance strategies, and enhanced monitoring systems to promote transparency and long-term sustainability in Albania's road infrastructure sector.

KEYWORDS: Road transport, public expenditure, efficiency, budgetary performance, infrastructure investments.

How to cite: Bilaj, V., & Liko, E. (2025). Assessing Budgetary Performance and Efficiency in Albania's RoadTransport Investments (2013-2023). *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 147-151). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17509832>

Introduction

The road transport sector represents a cornerstone of Albania's economic and social development. Efficient road networks facilitate the movement of goods, increase market accessibility, and strengthen regional integration. Over the past decade, the Albanian government has significantly increased public investment in road construction, rehabilitation, and maintenance, supported by both domestic and international funding sources, including the World Bank, EBRD, EIB, and the European Union through IPA programs.

This paper aims to assess budgetary performance and efficiency in the road transport sector by examining funding trends, execution rates, and the overall impact of these investments on economic development between 2013 and 2023.

Research Aim and Research Questions

The main aim of this study is to assess the budgetary performance and efficiency of public investments in Albania's road transport sector during the period 2013-2023. It seeks to evaluate how financial resources have been allocated, executed, and managed, and to determine the extent to which these investments have contributed to sustainable infrastructure development and regional balance.

To achieve this aim, the study addresses the following research questions:

1. How have budget allocations and execution rates in the road transport sector evolved between 2013 and 2023?
2. What are the main factors influencing the efficiency and effectiveness of public expenditure in road infrastructure?
3. To what extent do maintenance funding and regional distribution affect the sustainability of road investments in Albania?
4. What measures can improve transparency, equity, and long-term financial performance in the sector?

Research Results

To evaluate the budgetary performance of Albania's road transport sector, the analysis relies on official annual monitoring reports prepared by the Ministry of Finance and the Ministry of Infrastructure and Energy for the period 2013-2023. These reports provide comprehensive data on the planning, allocation, and utilisation of financial resources within the national

road program. They also include information on the structure of expenditures, the contribution of different financing sources—such as the state budget, development loans, and donor funds—and the progress of implementation for key infrastructure projects.

The data summarised in Table 1 present the evolution of planned and realised funds, execution rates, and the composition of primary financing sources across the ten-year period,

offering a clear picture of investment dynamics and fiscal performance in Albania's road transport sector.

Table 1

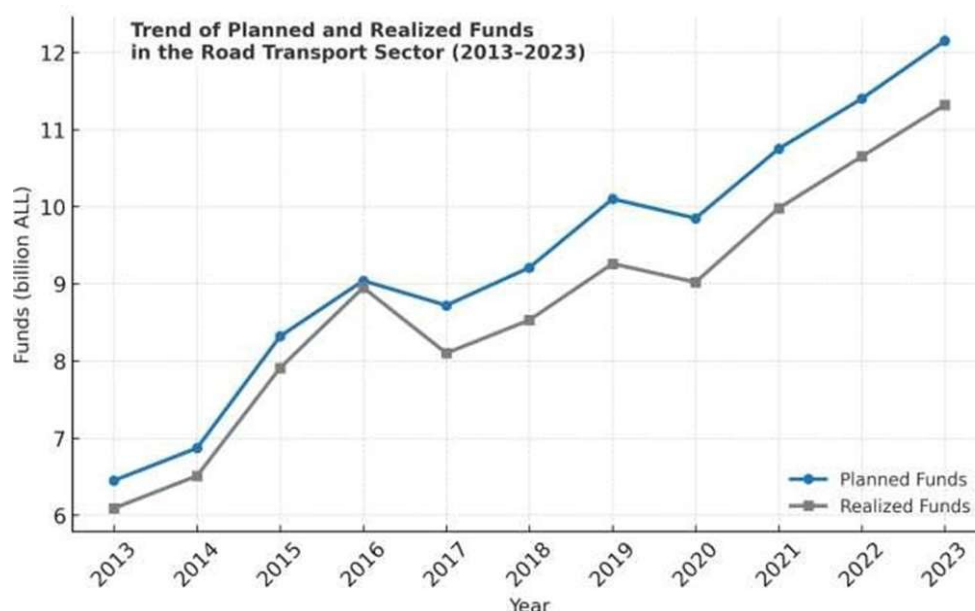
Evolution of budget allocations in Albania's road transport sector (2013-2023)

Year	Planned Funds (million ALL)	Realized Funds (million ALL)	% Execution	Main Financing Source	Major Projects or Segments
2013	6,450	6,090	94.4%	State Budget + EIB	Qafë-Thore-Theth Road, regional maintenance
2014	6,870	6,510	94.8%	WB + EBRD	Lin-Pogradec, Durrës- Kukës rehabilitation
2015	8,320	7,910	95.1%	Budget + Donors	Qukës-Qafë Plloçë , Shkodër-Velipojë
2016	9,040	8,946	99.0%	State Budget	Plepa-Kavajë Rrogozhinë, Arbër Road, Tirana Ring Road
2017	8,720	8,100	92.9%	WB + EIB + Budget	Kardhiq-Delvinë, rural connectors
2018	9,210	8,530	92.6%	Budget + IPA	PBMC maintenance , Tiranë-Elbasan
2019	10,100	9,260	91.7%	Budget + IPA II	Fier-Vlora widening , Arbër Road
2020	9,850	9,020	91.6%	Budget+Development Loans	Periodic maintenance , PBMC projects
2021	10,750	9,980	92.8%	Budget + IPA III	Fier Bypass, Nation Road, maintenance
2022	11,400	10,650	93.4%	Budget + WB/IPA	Vlora Bypass, Llogara Tunnel
2023	12,150	11,320	93.2%	State Budget	Llogara Tunnel, rural and urban roads

Source: Author's elaboration based on the Annual Budget Monitoring Reports for the Road Transport Sector (MFE & MIE, 2013-2023)

Figure 1

Trend of Planned and Realised Funds in the Road Transport Sector (2013-2023)



Source: Author's elaboration based on the Annual Budget Monitoring Reports for the Road Transport Sector (MFE & MIE, 2013-2023).

As shown in Table 1 and Figure 1, the budget allocated to the road transport sector followed a consistent upward trend during 2013 to 2023. In 2013, the planned budget was approximately 6.4 billion ALL, while by 2023, it had reached 12.15 billion ALL, nearly doubling within a decade. This reflects institutional commitment to improving infrastructure and regional integration. The average execution rate of 93-94% demonstrates strong fiscal discipline and efficient fund management.

The year 2016 recorded the highest execution level (99%), marking optimal financial and technical performance. Key projects completed during that year included the Plepa-Kavajë-Rrogozhinë segment, Arbër Road, and the Tirana Ring Road.

During 2017-2019, execution rates slightly declined due to delays in disbursements from international financing; however, performance-based maintenance programs (PBMPs) helped sustain road quality.

Between 2020 and 2023, despite the challenges posed by the COVID-19 pandemic, the sector maintained fiscal stability and implemented large-scale projects, including the Llogara Tunnel and the Fier and Vlora Bypasses.

Regionally, about 65% of total road investments were concentrated in central and southern Albania (Tirana, Fier, Vlora, Durrës), reflecting their strategic economic importance. However, this approach has exacerbated regional disparities, as northern and northeastern regions, such as Kukës and Dibër, received smaller allocations despite having higher infrastructure needs.

Maintenance remains underfunded, accounting for only 20–25% of annual resources, compared to 70–75% for construction and reconstruction. This imbalance may impact the long-term sustainability of the network, necessitating a new national maintenance strategy.

Conclusions and Recommendations

The analysis confirms that Albania's road transport sector maintained strong financial stability and efficient fund utilisation over the past decade. High budget execution rates and continuous project implementation reflect institutional maturity and improved coordination among implementing agencies. However, to ensure long-term sustainability and equitable regional development, several measures are recommended:

- Increase funding for regular and preventive road maintenance to preserve existing assets and reduce future rehabilitation costs;
- Balance investment distribution between regions, with greater focus on northern and northeastern areas;
- Expand performance-based maintenance contracts (PBMC) to enhance cost-efficiency and service quality;
- Strengthen the digital monitoring system (WEB-GIS) for real-time project tracking and transparency;
- Introduce measurable indicators to assess budgetary efficiency and socio-economic impact across the sector.

Overall, the road transport sector remains a key pillar of Albania's economic growth and regional connectivity. Achieving long-term efficiency requires a balanced approach between construction and maintenance, supported by transparent budgeting and evidence-based policymaking.

References

- European Bank for Reconstruction and Development (EBRD). (2023). *Annual review of infrastructure investments in the Western Balkans*. EBRD. <https://www.ebrd.com/infrastructure>
- Ministry of Finance and Economy. (2013–2023). *Annual budget monitoring reports for the road transport sector*. Ministry of Finance and Economy. <https://www.financa.gov.al>
- Ministry of Infrastructure and Energy. (2016). *Report on the implementation of products and expenditures for the 12-month period of 2016*. Ministry of Infrastructure and Energy. <https://www.infrastruktura.gov.al>
- World Bank. (2022). *Albania: Transport and infrastructure overview*. World Bank Publications. <https://www.worldbank.org/en/country/albania>



Digital Transformation, Artificial Intelligence & Sustainability in Management and Economics: A Bibliometric Analysis with VOSviewer Mapping

Zacharias Papanikolaou^{1*}, Apostolos Goulas², Ilias Tsotsas³, Maria Gianni⁴

¹ Agricultural Economics, PhD, Postdoctoral Researcher, Democritus University of Thrace, Greece

² Economist, Agricultural Economics, PhD, University of Thessaly, Greece

³ Economist, Service Design, PhD, International Hellenic University, Greece

⁴ Operations Management, PhD, Adjunct Lecturer, Hellenic Open University, Greece

✉ **Corresponding author:**

zachariaspapanikolaou@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study examines the interconnection between digital transformation, artificial intelligence and sustainability in the field of management and economics, through bibliometric analysis with the VOSviewer software. Data were extracted from the Scopus database using keywords that reflected the three main themes, covering the period from 2014-2025. A total of 153 publications were analysed, categorised into five clusters: climate change, economic development, artificial intelligence, data analysis, and digital inventory management. The results indicate a significant increase in scientific interest over recent years, accompanied by the emergence of technological innovation as a key factor in sustainable economic progress. The study contributes to the understanding of contemporary research trends and highlights the need for further investigation into topics such as the ethics of AI, digital equality and green development.

KEYWORDS: Digital Transformation, Artificial Intelligence, Bibliometric Analysis, Sustainability.

How to cite: Papanikolaou, Z., Goulas, A., Tsotsas, I., & Gianni, M. (2025). Digital Transformation, Artificial Intelligence & Sustainability in Management and Economics: A Bibliometric Analysis with VOSviewer Mapping. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 152-156). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17519072>

Introduction

Digital transformation, artificial intelligence (AI) and sustainability are three fundamental and interconnected forces that are radically reshaping the field of management and economics. In the modern era, the integration of digital technologies into business and economic processes is no longer an option, but a necessity for the survival and competitiveness of organisations. Technological progress, combined with the increasing social and institutional pressure for sustainable development, is shaping a new paradigm in decision-making, strategic management and policy formulation.

Digital Transformation refers to the widespread adoption of innovative technologies, such as big data, the Internet of Things (IoT), cloud computing and data analytics systems, to improve efficiency, transparency and value offered to stakeholders. At the same time, artificial intelligence, through machine learning and pattern analysis algorithms, enhances the predictive, automated and adaptive capabilities of businesses, allowing them to make more informed and rapid decisions. These technologies are not just changing the tools of management and financial analysis; they are transforming the very framework within which organisations operate.

The sustainability dimension provides a crucial ethical and strategic orientation to this transition. Businesses and economies are being called upon to align their development with environmental, social, and governance (ESG) objectives, creating value not only for shareholders but also for society as a whole. AI and digital technology can act as catalysts for sustainable development, providing tools for measurement, forecasting, and resource optimisation, as well as enhancing transparency and accountability (Papanikolaou et al., 2025).

However, the coexistence of these three dimensions also raises challenges. Issues such as digital inequality, AI ethics, data protection and the need for green infrastructure require careful analysis and regulation. Exploring the interactions between digital transformation, artificial intelligence, and sustainability, therefore, offers a fertile field for research in management and economics to develop models that combine technological innovation with social responsibility and the long-term resilience of systems (Sklavos et al., 2024).

Research Aim

The purpose of this research is to investigate the relationship between digital transformation, artificial intelligence, and sustainability in the fields of management and economics through a bibliometric analysis. The study aims to identify research trends, thematic overlaps, and emerging areas of interest in the international literature, highlighting the role of technological innovation in sustainable development. Furthermore, it aims to identify research gaps and potential directions for future studies, contributing to the understanding of how digitalisation is transforming modern economic and administrative models.

Research Results

The use of VOSviewer software requires data that can be retrieved from indexing services, such as Scopus and Web of Science. In this application of the VOSviewer software, data retrieved from the Scopus indexing service were used. The keywords used were "Digital Transformation", "Artificial Intelligence", "Sustainability", "Management", and "Economics" to identify them in the titles, abstracts,

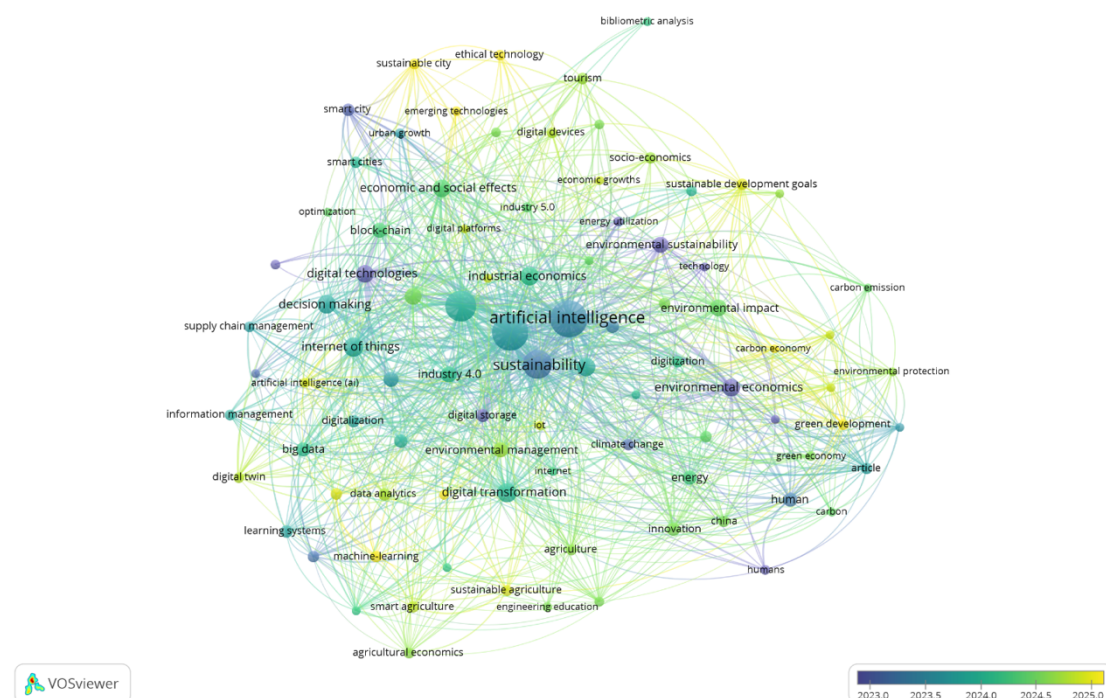
and keywords of the corresponding publications. The search was conducted without any time limit across the entire search range of this platform (Papanikolaou et al., 2025).

A total of 153 publications were extracted from the Scopus database for the search period 2014 to 2025. Over the last five years, 136 publications were identified, compared to the period from 2014 to 2020, when only 17 were recorded, indicating an exponential increase in scientific interest in the field. Using the VOSviewer software, five clusters were created based on the categorisation of the keywords of the publications. Cluster 1 includes words related to climate change and sustainable development, indicating a close connection between technological innovations and environmental goals. Cluster 2 encompasses issues related to economic development and business strategy, with a focus on the role of digitalisation in enhancing productivity and competitiveness. Cluster 3 is related to artificial intelligence, highlighting its applications in decision-making, automation and data management. Cluster 4 focuses on data analysis and big data, which are key tools for understanding and optimising business processes. Finally, cluster 5 concerns digital inventory and supply chain management, reflecting the importance of information technologies in business efficiency.

The analysis of the above clusters reveals that research interest is increasingly converging on the interconnection between digital innovation and sustainable economic development. Through bibliometric mapping, VOSviewer allows the capture of scientific trends and thematic overlaps, offering a valuable tool for investigating the evolution of the field and identifying potential research gaps.

Figure 1

Overlay map of keyword co-occurrence over time for papers published



Conclusions

This bibliometric analysis highlighted the rapid growth of scientific research linking digital transformation, artificial intelligence and sustainability in the field of management and economics. The significant increase in the number of publications over the last five years demonstrates the growing importance of digital technologies as a lever for sustainable development and economic resilience. Cluster analysis using VOSviewer revealed a multidimensional thematic structure, where artificial intelligence, data analysis, and digital management are inextricably linked to issues of environmental policy, corporate strategy, and economic efficiency.

The results confirm that digital innovation is not just a technological tool, but a strategic factor in transforming business and economic practices towards more sustainable and responsible operating models. At the same time, the increasing coexistence of issues related to climate change, data analysis and artificial intelligence indicates the emergence of a new scientific field, in which digitalisation acts as a connecting link between technological progress and sustainability.

However, the analysis also highlights research gaps related to the ethics of AI, the social dimension of digital inequality and the adoption of green technologies in developing economies. Future research can delve deeper into the interactions of these fields, combining quantitative and qualitative approaches. Overall, this study contributes to the understanding of the evolving relationship between technology, economics and sustainability, providing a framework for strategic planning and policies that promote a more digitally mature and sustainable economy.

References

- Gianni, M., & Gotzamani, K. (2024). The internalisation of integrated management systems as a key for sustainable companies: Empirical evidence. *Total Quality Management & Business Excellence*, 35(1-2), 273-296. <https://doi.org/10.1080/14783363.2023.2290659>
- Gianni, M., Gotzamani, K., & Tsiotras, G. (2017). Multiple perspectives on integrated management systems and corporate sustainability performance. *Journal of Cleaner Production*, 168, 1297-1311. <https://doi.org/10.1016/j.jclepro.2017.09.061>
- Gianni, M., Reitano, A., Fazio, M., Gkimperiti, A., Karanasios, N., & Taylor, D. W. (2023). Food literacy as a resilience factor in response to health-related uncertainty. *British Food Journal*, 125(3), 1067-1093. <https://doi.org/10.1108/BFJ-10-2021-1145>
- Gkarane, S., Papanikolaou, Z., Goulas, A., & Tsotsas, I. (2025). The economic impact and business management of small-scale running events: A strategic approach. In *World Conference on Emerging Science, Innovation and Policy 2025*. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15833702>
- Goulas, A., Tsotsas, I., Gkarane, S., & Papanikolaou, Z. (2025). Management approaches of agricultural enterprises in mountainous disadvantaged areas: The case of Agrafa. In *World Conference on*

- Emerging Science, Innovation and Policy* 2025. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15844867>
- Ioannidis, S., Karelakis, C., Papanikolaou, Z., & Theodossiou, G. (2022). Exploring digitalisation adaptation of agro-food firms: Evidence from Greece. *International Journal of Business and Economic Sciences Applied Research (IJBESAR)*, 15(1), 94–104. <https://hdl.handle.net/10419/280251>
- Karelakis, C., Papanikolaou, Z., Theodosiou, G., & Goulas, A. (2021). Local products dynamics and the determinants of purchasing behaviour. *Studies in Business and Economics*, 16(3), 72–86. <https://doi.org/10.2478/sbe-2021-0046>
- Papanikolaou, Z., Goulas, A., & Tsotsas, I. (2025). Business process management: A review and evaluation. In *International Conference on Next-Generation Innovations and Sustainability* 2025. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15091109>
- Papanikolaou, Z., Goulas, A., Tsotsas, I., & Gkarane, S. (2025). Digital transformation and business model innovation in the post-COVID era: A bibliometric analysis of financial and organizational perspectives. In *World Conference on Emerging Science, Innovation and Policy* 2025. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15833595>
- Papanikolaou, Z., Kefala, F., Karelekis, C., Theodosiou, G., & Goulas, G. (2022). Cities in competition: Is there a link between entrepreneurship and development? *World*, 3(4), 913–927. <https://doi.org/10.3390/world3040051>
- Sklavos, G., Theodossiou, G., Papanikolaou, Z., Karelakis, C., & Lazarides, T. (2024). Investigating the impact and challenges of digital transformation and green entrepreneurship in the Greek food industry. *Intellectual Economics*, 18(2), 360–383. <https://doi.org/10.13165/IE-24-18-2-06>
- Sklavos, G., Theodossiou, G., Papanikolaou, Z., Karelakis, C., & Lazarides, T. (2025). Reinforcing sustainability and efficiency for agrifood firms: A theoretical framework. In *Sustainability through green HRM and performance integration* (pp. 101–120). IGI Global. <https://doi.org/10.4018/979-8-3693-5981-5.ch005>
- Tsotsas, I., Papanikolaou, Z., & Goulas, A. (2025). Emerging trends in business sustainability: A bibliometric analysis in innovation practices. In *International Conference on Next-Generation Innovations and Sustainability* 2025. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15098298>
- Tsotsas, I., Gkarane, S., Papanikolaou, Z., & Goulas, A. (2025). Artificial intelligence in business innovation: A systematic bibliometric review. In *World Conference on Emerging Science, Innovation and Policy* 2025. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15844723>



Cooperation for Innovation: Main Drivers in Countries with Low Levels of Innovation

Carlos Labarcés-Ballestas¹, Ángel Peiró-Signes²

¹ Department of Business Organization, Universitat Politècnica de València, Spain, Universidad del Magdalena, Colombia

² Department of Business Organization, Universitat Politècnica de València, Spain

✉ **Corresponding author:**

clabarcés@unimagdalena.edu.co



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study seeks to identify the factors that drive business innovation by analysing innovation ecosystems from a collaborative perspective in countries with low levels of innovative activity. The study included more than 6,000 companies included in the EDIT 2020 survey conducted by DANE, the agency responsible for official statistics in Colombia. Artificial intelligence techniques such as machine learning were used to process the information. The main findings emphasise the importance of effectively managing internally developed knowledge and diversifying external sources of information.

KEYWORDS: Innovation Results, Cooperation, Machine Learning, Resources.

How to cite: Labarcés-Ballestas, C., & Peiró-Signes, A. (2025). Cooperation for Innovation: Main Drivers in Countries with Low Levels of Innovation. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 157-162). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17519170>

Introduction

In recent years, the concept of innovation has gained importance both in academic circles and within companies due to its role in the face of more demanding market conditions, with rapid technological changes, scarce resources and a more informed customer, which requires proactive companies in search of innovation, growth and efficiency even to survive (Damanpour, 1991).

The European Union (EU) has long recognised the importance of innovation in driving economic growth. Policies such as the Lisbon Strategy and the Europe 2020 Strategy have emphasised research-based innovation, with targets such as investing 3% of GDP in R&D (Europe 2020, 2010). However, the effectiveness of these policies in increasing innovation performance, especially for SMEs, is the focus of debate due to the specific challenges they face.

In Latin America, emerging economies like Colombia base their growth on primary sector products with little added value, which limits the development and transfer of innovation and thus hinders competitiveness and adaptability to new technologies. These emerging economies must move toward technological convergence, which enables developing countries or regions to gradually close technological gaps with developed countries through their own efforts in the technological development process, thereby surpassing developed countries (Hou, 2020).

For emerging economies with limited access to resources, innovation is crucial in raising macro-level productivity levels compared to other economies, enabling their companies to transition from an investment-based innovation strategy to a growth-oriented strategy.

Literature review

From a theoretical perspective, the Resource-Based View (RBV) broadly explains the impact of innovation on the development of companies, based on the integration of various external resources in a framework that seeks to produce synergistic effects to improve internal advantages (Xie et al., 2022), obtaining different forms of innovation (Peiró-Signes et al., 2022). Cooperation for innovation refers to the participation of an external agent in the company's innovative activities (Li-Ying et al., 2018), primarily due to the lack of internal knowledge and capabilities that necessitate its incorporation through cooperation (Diez-Martínez et al., 2022).

This collaboration is carried out with institutional allies (i.e., government entities, universities and research centres) (Kleine et al., 2022) and with allies linked to the market (i.e., suppliers, customers and competitors) (Kafouros et al., 2020) seeking to develop new products, better distribution, greater manufacturing flexibility and compliance with regulations (Najafi-Tavani et al., 2018).

Research questions

To date, most innovation studies have been conducted in companies located in stable, highly developed economies, with a smaller number of studies focusing on companies in emerging economies

with highly competitive economic sectors (Xu et al., 2021). To a greater extent, studies confirm the positive effect of cooperation on companies' innovation performance (Freire & Gonçalves, 2021), which is related to the quantity and quality of the knowledge acquired.

Developed countries, unlike emerging ones, are characterised by mature institutions (politically and geographically homogeneous), innovation systems with strong interconnections between actors, world-class universities, and solid indigenous research and development (R&D) capabilities (Kafourous et al., 2015). With this in mind, our work seeks to address the following question: What are the primary drivers of business cooperation in countries with low levels of innovation?

Methodology

This study is based on data from the 2020 Survey of Technological Development and Innovation in the Manufacturing Industry (EDIT), prepared by the National Administrative Department of Statistics (DANE) of Colombia. The EDIT is a key source of statistical data on the scientific, technological, and innovation activities of manufacturing firms in Colombia. For this study, we classified firms as innovative, following the definitions in the Oslo Manual (2005), if they introduced at least one new or significantly improved product or service, implemented a new or significantly improved process, or adopted a new organisational or marketing method during the reference period. Firms that did not introduce any of these innovations were classified as non-innovative. The Colombian manufacturing sector exhibits a relatively low innovation capacity compared to other countries: only 1,655 companies (24.35%) of the sample reported innovations, while 5,143 companies (75.65%) did not innovate during the period.

To identify the factors driving a company's ability to achieve innovative outcomes and assess their relative importance and the direction of their impact, we employ the XGBoost algorithm. This machine learning technique offers several advantages over traditional multivariate approaches.

The analysis presented is part of a larger project that includes the analysis of variables such as labour, investment, financing, barrier types, and others. Specifically, in this paper, we will present the results using those variables related to cooperation in companies as predictors.

Results

Model interpretation involves evaluating both its performance and the role of various predictors in determining its outcomes. Model quality is measured by its predictive accuracy, that is, its ability to correctly classify cases. In the confusion matrix [Figure 1], diagonal entries show correct classifications made by the model, while off-diagonal entries represent misclassifications. The model correctly classified 96.5% of cases, significantly exceeding the proportionality and maximum likelihood criteria recommended for multivariate classification techniques (Hair et al., 2014). SHAP scores provide a measure of the average contribution of each feature to the model's predictions. [Figure 2] summarises the average contribution of each predictor, while [Figure 3] offers additional insight by showing the direction and distribution of the SHAP scores. We employ Shapley (SHAP) scores, as this is a widely

accepted method for interpreting complex models.

Figure 1

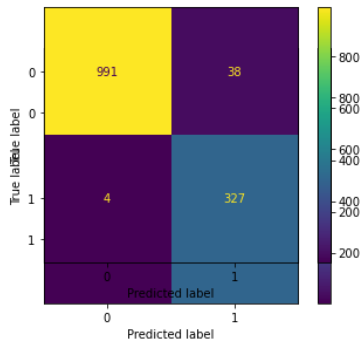


Figure 2

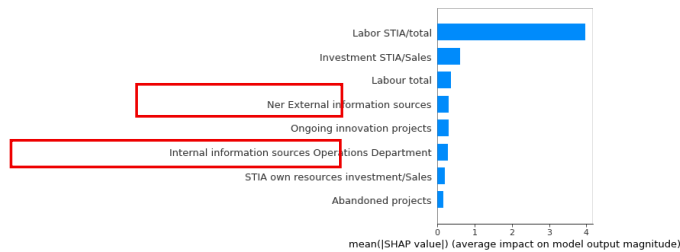
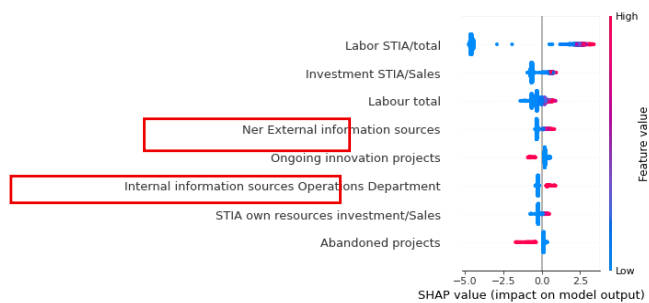


Figure 3



The results indicate that companies that use external sources, particularly those that rely on more than two types of external information, are more likely to report innovation results. Furthermore, companies that value internal information from their Operations Department as a key source of innovation are also more likely to be innovative. Furthermore, the type of partner or information source (Institutional-Market), the geographic origin (Local-Foreign), and the objective of the cooperation do not significantly contribute to the model's predictions.

Conclusions

Unlike findings in highly innovative regions, where ecosystem-driven factors such as collaboration and public-private partnerships act as central drivers of innovation (Hervás-Oliver et al., 2021), this study demonstrates a limited influence of these aspects in low-innovation contexts such as Colombia.

References

Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal*, 34(3), 555-590.

- Diez-Martinez, I., Peiro-Signes, A., & Segarra-Oña, M. (2022). The links between active cooperation and eco-innovation orientation of firms: A multi-analysis study. *Business Strategy and the Environment*. <https://doi.org/10.1002/bse.3288>
- EUROPE 2020. (2010). *Europe 2020: A strategy for smart, sustainable and inclusive growth*. European Commission.
- Freire, J. A. F., & Gonçalves, E. (2021). Cooperation in innovative efforts: A systematic literature review. *Journal of the Knowledge Economy*. <https://doi.org/10.1007/s13132-021-00837-3>
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2014). *Multivariate data analysis*. Cengage Learning.
- Hervás-Oliver, J. L., Parrilli, M. D., Rodríguez-Pose, A., & Sempere-Ripoll, F. (2021). The drivers of SME innovation in the regions of the EU. *Research Policy*, 50(9), 104316. <https://doi.org/10.1016/j.respol.2021.104316>
- Hou, J. (2020). The interdependency of innovation obstacles in Chinese manufacturing firms. In S. Dai & M. Taube (Eds.), *China's quest for innovation: Institutions and ecosystems* (pp. 123-141). Routledge.
- Kafouros, M., Love, J. H., Ganotakis, P., & Konara, P. (2020). Experience in R&D collaborations, innovative performance and the moderating effect of different dimensions of absorptive capacity. *Technological Forecasting and Social Change*, 150, 119757. <https://doi.org/10.1016/j.techfore.2019.119757>
- Kafouros, M., Wang, C., Piperopoulos, P., & Zhang, M. (2015). Academic collaborations and firm innovation performance in China: The role of region-specific institutions. *Research Policy*, 44(3), 803-817. <https://doi.org/10.1016/j.respol.2014.11.002>
- Kleine, M., Heite, J., & Huber, L. R. (2022). Subsidized R&D collaboration: The causal effect of innovation vouchers on innovation outcomes. *Research Policy*, 51(6), 104515. <https://doi.org/10.1016/j.respol.2022.104515>
- Li-Ying, J., Mothe, C., & Nguyen, T. T. U. (2018). Linking forms of inbound open innovation to a driver-based typology of environmental innovation: Evidence from French manufacturing firms. *Technological Forecasting and Social Change*, 135, 51-63. <https://doi.org/10.1016/j.techfore.2017.05.031>
- Najafi-Tavani, S., Najafi-Tavani, Z., Naude, P., Oghazi, P., & Zeynaloo, E. (2018). How collaborative innovation networks affect new product performance: Product innovation capability, process innovation capability, and absorptive capacity. *Industrial Marketing Management*, 73, 193-205. <https://doi.org/10.1016/j.indmarman.2018.02.009>

- Peiró-Signes, Á., Segarra-Oña, M., Trull-Domínguez, Ó., & Sánchez-Planelles, J. (2022). Exposing the ideal combination of endogenous-exogenous drivers for companies' eco-innovative orientation: Results from machine-learning methods. *Socio-Economic Planning Sciences*, 79, 101145. <https://doi.org/10.1016/j.seps.2021.101145>
- Xie, X., Wu, Y., & Devece, C. (2022). Is collaborative innovation a double-edged sword for firms? The contingent role of ambidextrous learning and TMT shared vision. *Technological Forecasting and Social Change*, 175, 121340. <https://doi.org/10.1016/j.techfore.2021.121340>
- Xu, T., Yang, J. J., Zhang, F., & Guo, W. Y. (2021). Interfirm coopetition, interfirm knowledge creation, and collaborative innovation performance: The moderating roles of environmental competitiveness and dysfunctional competition. *Industrial Marketing Management*, 99, 123–135. <https://doi.org/10.1016/j.indmarman.2021.10.003>



The Interaction Transition - Local Development: Contribution of Social Capital in Local Development

Florina Popa

Romanian Academy, Institute of
National Economy, Bucharest,
Romania

✉ **Corresponding author:**
florinapopa289@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: Transition takes place over time and involves change and adaptation to new conditions, such as those related to development, social, environmental, and cooperation. Local development encompasses economic and social development within the context of new relationships emerging between society and the state, with the state playing a leading role. Scientific literature identifies social capital as a central element in the interactions and connections that actors create, influencing relevant economic, social, and political decisions. Governments can act to promote social development simultaneously with efforts towards economic development and environmental sustainability, thereby balancing these three elements of transition. Being an interaction and mutual reinforcement. The purpose of this study is to highlight the interaction between local development and transition, as well as between the triple transitions (digital, ecological, and social), and the contribution of social capital to local development. The paper ends with conclusions that summarise the essential elements retained from the present study.

KEYWORDS: local development, connections, transition, triple transition, social capital.

How to cite: Popa, F. (2025). The Interaction Transition - Local Development: Contribution of Social Capital in Local Development. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 163-175). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17519343>

1. Introductory elements

The explanations given to the term "transition" differ depending on the context in which it is found and the field to which it relates, but for the most part, they show that transition reflects people's responses to a period marked by changes (Visentin, van Loon, 2006)

Referring to the concept of transition, the EBRD considers it in relation to the market economy, which must go beyond market conditions and be competitive, inclusive, well-governed, resilient, and integrated. (European Bank for Reconstruction and Development, EBRD).

Transition takes place over time and involves change and adaptation to new conditions, such as those related to development, social, environmental, and cooperation. (Kralik Visentin, van Loon, 2006).

In recent years, the notion of transition has focused on meeting environmental objectives, with the implicit requirement that the entire society be involved in the transition to a zero-emission future (UNDP, 2022). Becker et. al. (2016) (quoted from Chlebna, Suitner, 2025) signal the importance of local development as an element of achieving transition objectives. The specialised literature distinguishes the areas (local, district) in which the transition takes place, analysing their interdependence and interaction. At the same time, cities have been recognised as essential for transitions towards sustainability. (Bulkeley et al., 2011; Hodson și Marvin, 2010; Frantzeskaki et al., 2017; Ernst de Graaf-Van Dinther, Peek, Loorbach 2016) (quted by Köhler, Dütschke, Wittmayer, 2021).

Greater attention is paid to the level of city size, with smaller administrative or geographical structures being less researched. Cheung and Oßenbrügge (2020), as quoted by Köhler, Dütschke, and Wittmayer (2021), demonstrate that transitions at the city level should shift towards a more locally oriented concentration. The social character of the transition is given by the fact that it is borne by individuals, who respond, over time, to the consequences generated by it, more or less easily, depending on the existing conjuncture at the time of its occurrence (Kralik, Visentin van Loon, 2006).

At the World Forum for Local Economic Development (WFLED) ¹ in Seville, the importance of local economic development was emphasized for the transition of enterprises and employees from the informal to the formal stage, through its capacity (of local development) to stimulate local economic growth, through the connections that are formed between transition and local development, as follows (World Forum for Local Economic Development):

→ *The connection between transition and local development*, given by the capacity of local development to stimulate the economy, through the creation of new jobs, the development of infrastructure and its increase in quality, the simplification of regulations and a greater degree of access to finance and market penetration.

→ *The connection between local development and elements* such as the triple transition, social welfare, public-private partnership and employment strategies; these favour sustainable economic development and

¹"The World Forum on Local Economic Development (WFLED) is a multi-stakeholder alliance of committed governments, national and international organizations, whose objective is to promote the local economic development approach and advance political debate and strengthen global partnerships for concrete actions at local, national and international levels". International Labour Organization. World Forum for Local Economic Development Local economic development fuels the transition to formality, 7 April 2025, <https://www.ilo.org/resource/article/local-economic-development-fuels-transition-formality>.

protect resources, to ensure, in the best possible conditions, the standard of living. (Geneva, ILO News in World Forum for Local Economic Development).

→ *The connection between local economic development and transition*, given by the capacity of local development to ensure conditions for a sustainable and inclusive transition, by increasing social protection, supporting entrepreneurship, integrating the workforce, ensuring the legal framework and security at the workplace.

2. Local development - content elements, influences, challenges

Local development encompasses both economic and social development, characterised by the emergence of new relationships between society and the state, as well as the significant growth of network interconnections, with the state playing a leading role. (World Bank, 1997, Rhodes, 1997, quoted from Galaso, Rodríguez, Goinheix, 2018). Becattini (1979, quoted by Galaso, Rodríguez, & Goinheix, 2018) demonstrates that in local development processes, interaction occurs between social and economic organisations, with the territory serving as a space where citizens coexist.

Local development means the development of communities, the creation of a prosperous economic environment, increasing citizens quality of life, the provision of better working conditions and the creation of new jobs (OECD, Local Development; OECD, Local Development. Stuck in a rut? Sparking economic and social transformation, Local development). The process aims to create favourable conditions for the development of the local business environment and the formation of a competitive local economy. (Ettlinger, eds. Smelser N.J. and Baltes P.B., 2001). At the same time, the modern approach to local development also means social inclusion, social connections and a sense of civic pride. (OECD, Local Development; OECD, Local Development. Stuck in a rut? Sparking economic and social transformation, Local development)

The meaning of the term "local" differs depending on the level of reference: (Ettlinger, eds. N.J. Smelser and P.B. Baltes, 2001):

- ✓ In a *regional context*, a neighbourhood, city or metropolitan area;
- ✓ At the *country level*, a region within a nation.
- ✓ In a *global context*, a multinational region.

The observation of economic and social results at the local level takes into account the possibilities of development, of quality improvement, based on the valorisation of local and capital resources (OECD, Local Development; OECD, Local Development. Stuck in a rut? Sparking economic and social transformation, Local development). Some challenges arise related to demographic changes, globalisation, technological progress and climate change that exert pressures for local transformation. The prospects for the evolution of local communities depend on the local context (resources, policies, strategies) in which they manifest themselves, as some units are favourable, while others reveal gaps in development. (OECD, Local Development; OECD, Local Development. Stuck in a rut? Sparking economic and social transformation.

Addressing these issues, as well as developing policies for the future, to prevent risks and build resilience to shocks caused by possible economic crises or other unexpected events, requires local authorities and policymakers to focus on developing the local economy by creating strategies for local transformation that lead to long-term

positive outcomes. This involves leveraging local heritage resources, transferring skills, and increasing comparative advantages. (OECD, Local Development; OECD, Local Development. Stuck in a rut? Sparking economic and social transformation.

For Albuquerque (2015), local development is a territorial approach that promotes the social construction of the territory, namely, the creation of networks, institutions and social capital; these support the local strategy. Albuquerque, 2015, pp. 43) show that in studying local development, it is necessary to analyse organisations and how they interact with each other. Pike et al. (2011) (quoted from Galaso, Rodríguez, & Goinheix, 2018) demonstrate that local development is a process involving strategy, planning, and the implementation of actions.

Investments made can influence areas differently, depending on the historical context of the area, including social relations, management, industrial centres, and others. In this sense, Massey (1984) shows that each investment brings its contribution in a different way: division of labour, different economic development that overlaps the previous one, creating a socio-economic stratification by overlapping different levels of socio-economic development, the character and combinations of them influencing society differently (Ettlinger, N. 2001, eds.. Smelser N.J and. Baltes P.B.).

According to studies, citizen participation and democracy are important in local development. This is also highlighted by the opinion of Pike et al. (2011: 624-625) (quoted from Galaso, Rodríguez, and Goinheix, 2018), who emphasise that local development is based on social and political actions and principles that support them. Other research conducted in the regional field has shown the relevance of the relationships that are formed between actors and local organisations (Galaso, Rodríguez, Goinheix, 2018).

Local development depends on the interaction between key actors that can influence relevant economic, social, and political decisions. The scientific literature places social capital as a central element of the interactions and connections created between actors. As a result, local development is the result of synergies between several territorial components. (Galaso, Rodríguez, Goinheix, 2018). Local development is subject to a series of challenges such as: competition exerted globally, over different areas whose development is linked to the business environment; local financing resources; changes that occur in the relations between great powers; changes that occur in the geographical plan of labor mobility and employment and residential patterns connected to changes related to migration; interethnic social relations; policies and strategies. (Ettlinger, eds. Smelser N.J. and Baltes P.B., 2001).

Vázquez Barquero (2011), as quoted by Ettlinger (ed.), Smelser, N.J., and Baltes, P.B. (2001), shows that local development strategies differ depending on the conditions existing in each territory, including resources, needs, and capacities. The context in which the local economy evolves is shaped by *internal and external processes*, as well as the relationships that form between them. Internal (endogenous) processes refer to the influence of internal factors on development, such as the local business environment and the competitiveness of the industry. External (exogenous) processes are given by external factors such as the level of local development. (Ettlinger, eds. Smelser, N.J. and Baltes, P.B. 2001). Endogenous local development considers the territory as the place where interactions between individual actors, institutions, and knowledge take place (Rodríguez Miranda, 2015) (quoted from Galaso, Rodríguez, Goinheix, 2018).

Therefore, it can be considered that there is no single formula for local development.

3. Social capital in the context of local development

In local development processes, an important role lies in the social capital, social relations and institutional and cultural elements (Becattini, 1979; Maillat, 1995; Saxenian, 1994; Cooke et al., 2005) (quoted from Galaso, Rodriguez, Goinheix, 2018).

Camagni's (2009) approach (quoted from Pablo Galaso, Adrián Rodríguez Miranda, Sebastián Goinheix, 2018) regarding regional development considers that its basic element is "*territorial capital*", which includes: technology, natural resources, human capital and social capital.

Nijkamp (2016) (quoted from Galaso, Rodríguez, and Goinheix, 2018) uses the concept of "resource regions", considering that each region has resources that provide it with development capacities, offering optimal possibilities for combination to achieve high productivity in the economic and social areas.

The Social Capital Initiative (Grootaert, 1998) is a component of the World Bank's Social Development Department, an institution concerned with the study of social capital. Considers social capital as "internal social and cultural coherence of society, the norms and values that govern interactions among people and the institutions in which they are embedded" (Ismail Serageldin, Vice President, Special Programs Foreword in Christiaan Grootaert, 1998 Social Capital Initiative, Social Capital Initiative Working Paper No. 3, Social Capital: The Missing Link? , The World Bank Social Development Family Environmentally and Socially Sustainable Development Network April 1998, <https://documents1.worldbank.org/curated/en/902971468764409654/pdf/multi0page.pdf>).

As the *Social Capital Initiative (SCI)* (Grootaert, 1998) shows, studying these aspects offers the possibility of observing the capacity of communities to organise themselves to achieve common goals, from which they mutually benefit. (Anirudh and Shrader 2002) (quoted from de la Peña García, 2014). These values and norms facilitate the formation and maintenance of organisations that, in turn, provide greater socio-economic benefits.

Recent studies have analysed inter-organisational networks in local development. Ha et al. (2015) focused on the presence of local governments within the network in the actions initiated in the local development process in the USA. Esparcia et al. (2015) and Nardone et al. (2010) (quoted from Galaso, Rodríguez, and Goinheix, 2018) focused on the study concerning *the involvement of local actors in social and economic territorial development in countries* such as Spain and Italy. Bellandi and Caloffi (2010), as quoted by Galaso, Rodríguez, and Goinheix (2018), analysed the impact of innovation policies in Italy on regional development through the creation of networks, which led to varied results.

Lin (2000a; 2000b) observes that social capital is considered as assets contained in networks, seen in two forms (quoted from de la Peña García, 2014):

- ✓ *Integrated resources* which refer to the resources that each member of the network possesses and which give them a certain power of influence within the network;

- ✓ *Network locations* refer to the structure and capacity of the network, as determined by certain characteristics it possesses, which either favour or hinder the possibility of other actors obtaining gains.

Various regional studies have demonstrated *the roles* of social capital and social relations, as well as institutional and cultural elements, in local development processes (Becattini, 1979; Maillat, 1995; Saxenian, 1994; Cooke et al., 2005). (quoted from [Galaso, Adrián Rodríguez Miranda, Sebastián Goinheix](#), 2018) In this respect, it

is considered that social relations are essential elements in local development, since they can favour or stop the implementation of some local economic, social and political initiatives based on connections and collaborative relationships among individuals, organisations and institutions, to carry out a socio-territorial project that will lead to territorial development. Additionally, the authors of the Californian School (Storper, 1988; Scott, 1988, 1996; Scott and Storper, 2007; Saxenian, 1994) (quoted from [Galaso, Adrián Rodríguez Miranda, Sebastián Goinheix, 2018](#)) demonstrate that the competitive advantages of regions are based on *social capital*. Vázquez Barquero (2002, 2010) (quoted from [Galaso, Adrián Rodríguez Miranda, Sebastián Goinheix, 2018](#)) believes that local development is the result of coordinating factors such as the organisation of production, the dissemination of innovation or urban infrastructures that manifest themselves in an institutional environment that favours socialisation and economic interactions (Vázquez Barquero and Rodríguez-Cohard, 2016). (quoted from Galaso, Rodríguez Goinheix, 2018).

In the professional scientific literature, there are a series of analyses that study *the impact of social capital* on social and economic aspects of cities and regions (Iyer and colab, 2005; Putnam, 1993; Boschma, 2005; Cooke et al., 2005) (quoted from [Galaso, Adrián Rodríguez Miranda, Sebastián Goinheix, 2018](#)). Network-focused analysis, as evaluated by social capital (Burt, 2000; Lin, 2005), as quoted from [Galaso, Rodríguez, and Goinheix \(2018\)](#), reveals *the ability of social capital to create relationships between individuals*. (Burt, 2000).

The scientific approach in the field of social networks reveals a wide range of theories and methodologies for analysing social relations. (Easley and Kleinberg, 2010; Jackson, 2008), (quoted from [Galaso, Rodríguez, Goinheix, 2018](#)). The terms '*nodes*' are used to refer to *social actors* (individuals, organisations, or firms), and '*connections*' refer to the *cooperation relations* or *interactions* that are formed between them.

Grootaert (1998, 1999, 2001, 2002a, 2002b), a specialist at the World Bank, demonstrates that belonging to organisations whose members come from diverse professional and educational backgrounds offers the advantage of sharing knowledge through the mutual exchange of information, as well as socially and economically favourable circumstances outside the organisation. Thus, social relationships are a means by which people benefit from different opportunities within organisations. Grootaert's claim aligns with the observed issues of other experts in the field of social networks, who have referred to social capital. They show that as the diversity of the network increases, the information becomes richer and richer. (by de la Peña García, 2014).

The role of local actors in local development is underscored by their significant influence in formulating and implementing local development policies. (Vázquez Barquero, 2011). Garofoli (2002) believes that local public and private organisations can participate in the process of local development. Arocena (2002) shows that the formation of a network of local actors is important for the connections that are formed between actors and the possibilities of transmitting knowledge, norms, and values within the network. The presence of extensive networks of connections between local actors is crucial for certain types of local development, such as industrial development. (Dei Ottati, 1994; Becattini, 1979). To support the performance of the territory, it is necessary to foster interaction between actors from the education/research fields and other organisations within local networks. For example, universities and research centres are important actors in local development processes (Goddard and Vallance, 2011), contributing to increased territorial performance (Power and Malmberg, 2008). (quoted from Galaso, Rodríguez, Goinheix, 2018).

4. The Triple Transition - Importance, Content and Types of Connections

4.1. Importance, Content

Digital, environmental and social transitions stand out in a global context, marked by crises and challenges in recent years (climate change, geopolitical conflicts, health crisis), constituting a brake on progress and determining the search for collective solutions to overcome them. (OECD, 2023, Towards a Triple Transition. Strategies for Transformational European Development Action.

The digital transition is a determinant of economic transformation, referring to advanced technologies, technological advancements, digitalisation, and artificial intelligence.

The environmental transition refers to the shift towards sustainable production and consumption systems, characterised by low pollution levels, the use of renewable energy, the conservation and protection of biodiversity, the implementation of the circular economy, and the pursuit of measures to mitigate the effects of climate change.

The social transition accompanies the green and digital transitions, aiming to *reduce the poverty rate and increase social inclusion*. These objectives form a *foundation for achieving the other two transitions*. (OECD, 2023, Towards a Triple Transition. Strategies for Transformational European Development Action.

A series of social challenges, including increasing inequality and political instability globally, rising poverty rates, labour market imbalances, and a decline in human development, expose society to risks and require effective solutions. In this sense, the development of strategies must take into account the links that form between the three types of transitions. Social aspects are a priority in the new growth strategies. Political strategies and the decision-making process must adapt to the effects of digital and environmental transitions for vulnerable groups and to achieve social inclusion. (OECD, 2023, Towards a Triple Transition. Strategies for Transformational European Development Action.

A triple transition is a systemic approach whose central element is the *interconnections* between the *environmental, digital and social* dimensions. Systemic transformations make it possible to overcome the difficulties that arise in the social and political plane and to find solutions to combat the effects of environmental degradation. (OECD, 2023, Towards a Triple Transition. Strategies for Transformational European Development Action.

Within the triple transition - *the social transition pillar* - it is constituted as a form of guarantee that aspects related to social vulnerabilities are at the heart of new development methods. Thus, *the triple transition encourages* an increase in productivity, innovation, and digital inclusion; the development of a green economy; and an increase in social well-being and cohesion, through a decision-making, participatory, and legitimate framework. (FIAPP, 2022; Sanahuja, 2021) (ILO, 2023) (quoted from OECD, 2023, Towards a Triple Transition. Strategies for Transformational European Development Action).

Social transition considers the role of social dynamics in achieving economic productivity and development, as well as a sustainable local environment. (OECD, 2023, Towards a Triple Transition. Strategies for Transformational European Development Action.

This form of transition favours the increasing role of the welfare state in adopting various policies aimed at increasing levels of well-being and social cohesion (Barron et al., 2023). (quoted from OECD, 2023, Towards a Triple Transition. Strategies for Transformational European Development Action. As such, the social transition is

mainly oriented towards: (OECD, 2023, Towards a Triple Transition. Strategies for Transformational European Development Action)

- ✓ ensuring the growth of well-being and equity;
- ✓ increasing the standard of living at the level of society, the existence of a common sense of belonging to a larger community;
- ✓ legitimate and participatory nature of decision-making processes.

Local governments are working to *increase social inclusion and equity*. Thus, within the Urban Transitions Alliance, cities are developing new ways to involve citizens in decision-making and create opportunities to increase their well-being. (Urban Transitions Alliance, Social Transition).

4.2. Types of connections in the context of the triple transition

The triple transition offers the possibility of perceiving *connections* formed *between the three transitions*, and between them, there is interaction and mutual reinforcement. Through *the social transition*, the implementation of *social policies* ensures that society can benefit from the results obtained through the green and digital transitions. (OECD, 2023 Towards a Triple Transition. Strategies for Transformational European Development Action.

By respecting the principle of equity, governments can implement policy initiatives that promote social development simultaneously with efforts towards economic development and environmental sustainability. There is interaction and mutual reinforcement between these three elements of a transition. (OECD, 2023 Towards a Triple Transition. Strategies for Transformational European Development Action.

→The social aspects of the social transition must be taken into account in relation to the *environmental and digital* transition by implementing social policies through which societies have the possibility to maximise their results and to jointly benefit from the advantages offered by the green and digital transitions. (OECD 2023, Towards a Triple Transition. Strategies for Transformational European Development Action.

→ Poverty, inequality, climate change and access to education *are interconnected in a network where the effects intensify each other*. For example, poverty can exacerbate environmental degradation because individuals facing challenges may act unsustainably in their efforts to address current needs, thereby harming the environment in an attempt to overcome the crisis. Similarly, climate change can have adverse effects on vulnerable communities, which are often felt unequally and exacerbate existing economic disparities. (OECD, 2023, Towards a Triple Transition. Strategies for Transformational European Development Action.

→The triple transition reflects *the interconnections between transitions* and emphasises the role of public policies and the effects they have on development dynamics. Understanding the *interconnections between social, environmental, and digital* transitions is crucial for informed decision-making and effective involvement in partnerships that can address national development aspirations and needs. There are *several types of interactions that depend on contextual factors such as governance systems, geographical conditions and policies practised*. (Nilsson et al., 2018). (quoted from OECD, 2023 Towards a Triple Transition. Strategies for Transformational European Development Action.

The importance of the triple transition lies in the analytical framework it proposes, through policies that stabilise the green, digital and social transitions. The triple transition framework systematically approaches

transitions, focusing on the positive and negative interconnections that form between its three forms. It also examines the causes that contribute to the existence of social inequalities, to identify potential unforeseen situations in the development process. *The social transition* is viewed as an independent process that reflects the benefits of other forms of transition, through the impact of social determinants and by addressing social challenges, thereby expressing the current concerns of new development strategies (OECD, 2023, Towards a Triple Transition: Strategies for Transformational European Development Action).

→The triple transition involves *interconnecting the green, social and digital transitions*. This involves making balanced progress across the transitions and focusing on the interactions between them, ensuring policy coherence and its impact. (OECD, 2023, Towards a Triple Transition. Strategies for Transformational European Development Action).

In this context, the possibility is created for the European Union to develop a new strategy for international cooperation, centred on the triple transition, creating conditions for the European Union to become a leader in the field of development (OECD, 2023, Towards a Triple Transition: Strategies for Transformational European Development Action).

5. Conclusions

Local development encompasses both economic and social development, characterised by the emergence of new relationships between society and the state, as well as the significant growth of network interconnections, with the state playing a leading role. The phenomenon depends on the interaction between key actors who can influence relevant economic, social, and political decisions. Scientific literature identifies social capital as a central element in the interactions and connections created between actors.

Becker et al. (2016) highlight *the importance of local development* as a key element in achieving the transition objectives. In local development processes, social capital, social relations, and institutional and cultural elements play a crucial role. In this sense, social relations are considered essential elements in local development, as they can either favour or hinder the implementation of local economic, social, and political initiatives, based on connections and collaborative relationships between individuals, organisations, and institutions, to achieve a socio-territorial project that leads to territorial development.

The triple transition (social, environmental, and digital) presents the top opportunity to perceive *connections* formed among the three types of transitions, *with interaction and mutual reinforcement between them*. Through the *social transition*, the implementation of *social policies* ensures that society has the opportunity to benefit from the results obtained through the green and digital transitions.

The triple transition reflects *the interconnections between transitions* and emphasises the role of public policies and their effects in the dynamics of development. Understanding the interconnections between social, environmental, and digital transitions is crucial for informed decision-making and practical addressparticipation in partnerships that can respond national development aspirations and needs. (Nilsson et al., 2018). (quoted from OECD, 2023, Towards a Triple Transition. Strategies for Transformational European Development Action)

The importance of the triple transition lies in the analytical framework it proposes, through policies that stabilise the green, digital and social transitions. The Triple Transition involves the interconnection of the green, social and digital transitions. This involves achieving balanced progress across the transitions and focusing on the

interactions between them, ensuring policy coherence and its impact. Thus, *the triple transition encourages* increased productivity, innovation, and digital inclusion; the development of a green economy; and increased social well-being and cohesion.

Concerns about the social effects of environmental and digital transitions are insufficient to prompt intervention in resolving social, economic, and environmental imbalances. The lack of appropriate policy initiatives can lead to the deterioration of the interconnections between the transitions, and, at the same time, there is the possibility that political measures and technology can exert an unfavourable influence. The triple transition approach highlights the importance of carefully examining the interconnected dimensions of green, digital, and social, which are *interdependent*. (OECD, 2023, Towards a Triple Transition. Strategies for Transformational European Development Action

Acknowledgment: This article is a part of the research paper achieved in the year 2025, by a research team of Institute of National Economy, Romanian Academy "*Tripla tranziție a mediului urban din România - digitală, ecologică și socială. Identificarea nevoilor și analiza transferului de bune practici*".

References

- Albuquerque, F. (2015). El enfoque del desarrollo económico territorial. In P. Costamagna & S. Pérez Rozzi (Eds.), *Enfoque, estrategias e información para el desarrollo territorial: Los aprendizajes desde...*
- Anirudh, K., & Schrader, E. (2002). Social capital assessment tool. In C. Grootaert & T. van Bastelaer (Eds.), *Understanding and measuring social capital: A multidisciplinary tool for practitioners* (pp. 65-84). World Bank.
- Arocena, J. (2002). *El desarrollo local: Un desafío contemporáneo*. Santillana.
- Bebbington, A. (2006). *Social movements and the politicization of chronic poverty policy* (CPRC Working Paper No. 63). Chronic Poverty Research Centre.
- Becattini, G. (1979). Dal settore industriale al distretto industriale: Alcune considerazioni sull'unità d'indagine dell'economia industriale. *Rivista di Economia e Politica Industriale*, 5(1), 7-21.
- Becker, S., Bues, A., & Naumann, M. (2016). Zur Analyse lokaler energiepolitischer Konflikte: Skizze eines Analysewerkzeugs. *Raumforschung und Raumordnung*. <https://doi.org/10.1007/s13147-016-0380-0>
- Bellandi, M., & Caloffi, A. (2010). An analysis of regional policies promoting networks for innovation. *European Planning Studies*, 18(1), 67-82.
- Boschma, R. A. (2005). Social capital and regional development: An empirical analysis of the Third Italy. In R. A. Boschma & R. C. Kloosterman (Eds.), *Learning from clusters* (pp. 139-168). Springer.
- Bulkeley, H., Castán Broto, V., Hodson, M., & Marvin, S. (2011). *Cities and low carbon transitions*. Routledge.
- Barron, P., et al. (2023). Social sustainability and the development process: What is it, why does it matter, and how can it be enhanced? *Policy Research Working Paper* (No. 10487). World Bank.
- Burt, R. S. (2000). The network structure of social capital. *Research in Organizational Behavior*, 22, 345-423.
- Camagni, R. (2009). Territorial capital and regional development. In R. Capello & P. Nijkamp (Eds.), *Urban dynamics and growth* (pp. 118-142). Elsevier.
- Chlebna, C., & Suitner, J. (2025). The transition-development nexus: Disentangling growth and transformation agendas in regional sustainability transitions. *Review of Regional Research*. <https://doi.org/10.1007/s10037-025-00231-5>
- Cheung, T. T. T., & Oßenbrügge, J. (2020). Governing urban energy transitions and climate change: Actions, relations and local dependencies in Germany. *Energy Research & Social Science*, 70, 101728. <https://doi.org/10.1016/j.erss.2020.101728>

- Cooke, P., Clifton, N., & Oleaga, M. (2005). Social capital, firm embeddedness and regional development. *Regional Studies*, 39(8), 1065-1077.
- de la Peña García, A. (2014). Social capital, culture and theories of development. *Antípoda*, 18, 213-233. <https://doi.org/10.7440/antipoda18.2014.10>
- Dei Ottati, G. (1994). Trust, interlinking transactions and credit in the industrial district. *Cambridge Journal of Economics*, 18(6), 529-546.
- Easley, D., & Kleinberg, J. (2010). *Networks, crowds, and markets: Reasoning about a highly connected world*. Cambridge University Press.
- Ernst, L., de Graaf-Van Dinther, R. E., Peek, G. J., & Loorbach, D. A. (2016). Sustainable urban transformation and sustainability transitions: Conceptual framework and case study. *Journal of Cleaner Production*, 112(4), 2988-2999.
- Esparcia, J., Escribano, J., & Serrano, J. (2015). From development to power relations and territorial governance: Increasing the leadership role of LEADER Local Action Groups in Spain. *Journal of Rural Studies*, 42, 29-42.
- Ettlinger, N. (2001). Local economic development. In N. J. Smelser & P. B. Baltes (Eds.), *International encyclopedia of the social & behavioral sciences* (pp. 9004-9008). Elsevier.
- European Bank for Reconstruction and Development. (n.d.). *The EBRD and transition*. <https://www.ebrd.com/home/who-we-are/ebrd-values/ebrd-transition.html>
- FIIAPP. (2022). *La incipiente articulación entre las transiciones social, ecológica y digital en la Unión Europea y en América Latina y el Caribe*. https://www.fiiapp.org/wp-content/uploads/2022/09/1_Informe_Transiciones_FIIAPP_3.pdf
- Frantzeskaki, N., Castán Broto, V., Coenen, L., & Loorbach, D. (Eds.). (2017). *Urban sustainability transitions*. Routledge.
- Galaso, P., Rodríguez, A. M., & Goinheix, S. (2018). Local development, social capital and social network analysis: Evidence from Uruguay. *Revista de Estudios Regionales*, 113, 137-163.
- Garofoli, G. (2002). Local development in Europe: Theoretical models and international comparisons. *European Urban and Regional Studies*, 9(3), 225-239.
- Goddard, J., & Vallance, P. (2011). Universities and regional development. In A. Pike, A. Rodríguez-Pose, & J. Tomaney (Eds.), *Handbook of local and regional development* (pp. 425-437). Routledge.
- Grootaert, C. (1998). *Social capital: The missing link?* (Social Capital Initiative Working Paper No. 3). World Bank.
- Grootaert, C. (1999). *Social capital, household welfare, and poverty in Indonesia* (Local Level Institutions Working Paper No. 6). World Bank.
- Grootaert, C. (2001). *Does social capital help the poor? A synthesis of findings from the Local Level Institutions studies in Bolivia, Burkina Faso and Indonesia* (Local Level Institutions Working Paper No. 10). World Bank.
- Grootaert, C., & van Bastelaer, T. (Eds.). (2002a). *Understanding and measuring social capital: A multidisciplinary tool for practitioners*. World Bank.
- Grootaert, C., & van Bastelaer, T. (Eds.). (2002b). *The role of social capital in development: An empirical assessment*. Cambridge University Press.
- Ha, H., Lee, I., & Feiock, R. (2015). Organizational network activities for local economic development. *Economic Development Quarterly*, 30(1), 15-31.
- Hodson, M., & Marvin, S. (2010). Can cities shape socio-technical transitions and how would we know if they were? *Research Policy*, 39(4), 477-485.
- International Labour Organization. (2023a). *Frequently asked questions on just transition*. https://www.ilo.org/global/topics/green-jobs/WCMS_824102/lang-en/index.htm

- International Labour Organization. (2023b). *Social Protection & Public Financial Management*. <https://socialprotection-pfm.org/>
- International Labour Organization. (2025). *Local economic development fuels the transition to formality*. World Forum for Local Economic Development. <https://www.ilo.org/resource/article/local-economic-development-fuels-transition-formality>
- Iyer, S., Kitson, M., & Toh, B. (2005). Social capital, economic growth and regional development. *Regional Studies*, 39(8), 1015–1040. <https://doi.org/10.1080/00343400500327943>
- Jackson, M. O. (2008). *Social and economic networks*. Princeton University Press.
- Köhler, J., Dütschke, E., & Wittmayer, J. (2021). Introduction to “Zooming in and out: Special issue on local transition governance.” *Environmental Innovation and Societal Transitions*, 40, 203–206.
- Kralik, D., Visentin, K., & van Loon, A. (2006). Transition: A literature review. *Journal of Advanced Nursing*, 55(3), 320–329. <https://doi.org/10.1111/j.1365-2648.2006.03899.x>
- Lin, N. (2000). Inequality in social capital. *Contemporary Sociology*, 29(6), 785–795.
- Lin, N. (2001a). *Social capital: A theory of social structure and action*. Harvard University Press.
- Lin, N. (2001b). Building a network theory of social capital. In N. Lin, K. Cook, & R. Burt (Eds.), *Social capital: Theory and research* (pp. 3–29). Aldine de Gruyter.
- Lin, N. (2005). A network theory of social capital. In D. Castiglione, J. W. van Deth, & G. Wolleb (Eds.), *The handbook of social capital* (pp. 50–69). Oxford University Press.
- Maillat, D. (1995). Les milieux innovateurs et dynamique territoriale. In A. Rallet & A. Torre (Eds.), *Économie industrielle et économie spatiale* (pp. 211–231). Economica.
- Massey, D. (1984). *Spatial divisions of labour: Social structures and the geography of production*. Methuen.
- Nardone, G., Sisto, R., & Lopolito, A. (2010). Social capital in the LEADER Initiative: A methodological approach. *Journal of Rural Studies*, 26(1), 63–72.
- Nijkamp, P. (2016). The resourceful region: A new conceptualisation of regional development strategies. *Investigaciones Regionales – Journal of Regional Research*, 36, 191–214.
- Nilsson, M., et al. (2018). Mapping interactions between the sustainable development goals: Lessons learned and ways forward. *Sustainability Science*, 13, 1489–1503. <https://doi.org/10.1007/s11625-018-0604-z>
- Organisation for Economic Co-operation and Development. (n.d.-a). *Local development*. <https://www.oecd.org/en/topics/local-development.html>
- Organisation for Economic Co-operation and Development. (n.d.-b). *Local development – Key messages: Stuck in a rut? Sparking economic and social transformation*. <https://www.oecd.org/en/topics/sub-issues/local-development.html>
- Organisation for Economic Co-operation and Development. (2023). *Towards a triple transition: Strategies for transformational European development action*. <https://doi.org/10.1787/094322ba-en>
- Pike, A., Rodríguez-Pose, A., & Tomaney, J. (2011). Local and regional development: Reflections and futures. In A. Pike, A. Rodríguez-Pose, & J. Tomaney (Eds.), *Handbook of local and regional development* (pp. 1–21). Routledge.
- Power, D., & Malmberg, A. (2008). The contributions of universities to innovation and economic development: In what sense a regional problem? *Cambridge Journal of Regions, Economy and Society*, 1(2), 233–245.
- Putnam, R. D. (1993). *Making democracy work: Civic traditions in modern Italy*. Princeton University Press.
- Rhodes, R. A. W. (1997). *Understanding governance*. Open University Press.
- Rodríguez, A. M. (2015). Dinámicas sectoriales y desarrollo territorial en economías locales interiores: El caso de Rivera en Uruguay. *Economía, Sociedad y Territorio*, 15(47), 217–250.

- Sanahuja, J. (2021). 30 años de Mercosur: El reto de las tres transiciones, digital, social y “verde”, y las relaciones con la Unión Europea. *Iberoamérica Global - Fundación Carolina*. <https://www.fundacioncarolina.es/30-anos-de-mercosur-el-reto-de-las-tres-transiciones-digital-social-y-verde-y-las-relaciones-con-la-union-europea/>
- Saxenian, A. (1994). *Regional advantage: Culture and competition in Silicon Valley and Route 128*. Harvard University Press.
- Scott, A. J. (1988). *New industrial spaces: Flexible production organization and regional development in North America and Western Europe*. Pion.
- Scott, A. J. (1996). Economic decline and regeneration in a regional manufacturing complex. *Entrepreneurship & Regional Development*, 8(1), 75-98.
- Scott, A. J., & Storper, M. (2007). Regions, globalization, development. *Regional Studies*, 41(1), 191-205.
- Storper, M. (1988). Las economías regionales como activos relacionales. *Economías*, 41, 10-45.
- United Nations Development Programme. (2022, November 3). *What is just transition? And why is it important?* Climate Promise. <https://climatepromise.undp.org/news-and-stories/what-just-transition-and-why-it-important>
- Urban Transitions Alliance. (2017). *Transition briefing sheet: Social transition*. https://urbantransitions.org/wp-content/uploads/2017/01/Transition-briefing-sheet_social.pdf
- Vázquez Barquero, A. (2002). *Endogenous development: Networking, innovation, institutions and cities*. Routledge.
- Vázquez Barquero, A. (2010). *The new forces of development: Territorial policy for endogenous development*. World Scientific Publishing.
- Vázquez Barquero, A. (2011). Local development: A response to the economic crisis. Lessons from Latin America. In A. Pike, A. Rodríguez-Pose, & J. Tomaney (Eds.), *Handbook of local and regional development* (pp. 497-508). Routledge.
- Vázquez-Barquero, A., & Rodríguez-Cohard, J. C. (2016). Endogenous development and institutions: Challenges for local development initiatives. *Environment and Planning C: Government and Policy*, 34(6), 1135-1153.
- World Bank. (1997). *World development report 1997: The state in a changing world*. Oxford University Press.
- World Forum for Local Economic Development / International Labour Organization. (n.d.). *Local economic development fuels the transition to formality*. ILO News. <https://www.ilo.org/resource/article/local-economic-development-fuels-transition-formality>



Strategic Management of Locally-Driven Tourism Events for Destination Sustainability

**Sofia Gkarane^{1*}, Maria Gianni², Apostolos Goulas³,
Ilias Tsotsas⁴, Zacharias Papanikolaou⁵**

¹Tourism Marketing, PhD, Adjunct Lecturer and Postdoctoral Researcher, International Hellenic University, Greece

²Operations Management, PhD, Adjunct Lecturer, Hellenic Open University, Greece

³Economist, Agricultural Economics, PhD, University of Thessaly, Greece

⁴Economist, Service Design, PhD, International Hellenic University, Greece

⁵Agricultural Economics, PhD, Postdoctoral Researcher, Democritus University of Thrace, Greece

✉ ***Corresponding author:**

sgkarane@ihu.gr



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This paper explores how small-scale event organisers manage their initiatives to contribute to sustainable destination development. Based on qualitative interviews with organisers of local cultural and sports events held in Greece, our findings highlight strategies for marketing positioning, resource mobilisation, stakeholder collaboration, and legacy building. Despite constraints and challenges, organisers appear to act as destination managers in practice, balancing tourism impacts with community goals.

KEYWORDS: small-scale events, regional development, stakeholder collaboration, place-making, tourism, cultural festivals, sport tourism.

How to cite: Gkarane, S., Gianni, M., Goulas, A., Tsotsas, I., & Papanikolaou, Z. (2025). Strategic Management of Locally-Driven Tourism Events for Destination Sustainability. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 176-180). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17528280>

Introduction

Large-scale events have been widely discussed both by researchers and media mainly due to their substantial economic impact, but small-scale events, such as local cultural or sports ones, are also capable of delivering significant benefits to local businesses and communities (Daniels et al., 2003; Gibson et al., 2012; Gkarane et al., 2024). These locally organized events are typically managed informally and with limited funding, producing less revenue than significant events (Gibson et al., 2012). Despite this, the importance of small events for local development should not be underestimated (Gkarane et al., 2025; Gursoy et al., 2004). Lesser-known destinations have

experienced increased tourism activity due to local cultural and sports events, fostering sustainable growth (Goulas, 2025; Melo et al., 2021). Their potential lies in two main areas: they can attract tourists throughout the year, and they can also contribute to the social and cultural life of a destination, leading to valuable intangible benefits (Gibson et al., 2012; Gkarane and Vassiliadis, 2024; Gkarane et al., 2025). Indeed, locally driven events have grown significantly and become popular; yet, there has been a lack of research evaluating their social, environmental, and cultural consequences on the destination, primarily through the lens of their organizers (Gkarane, 2024; Gursoy et al., 2004). When organized regularly, these events can significantly support local sustainable development by utilizing existing resources effectively, encouraging community participation, and ensuring a continuous flow of visitors (Melo et al., 2021). Besides, these initiatives can often employ innovative business strategies that benefit both the economy and the local community (Goulas et al., 2025; Papanikolaou et al., 2025; Tsotsas et al., 2025).

Despite the acknowledged value of these events, academics have mainly neglected the strategic managerial approaches adopted by their organizers. Current research primarily investigates the experiences of participants, spectators, and host communities (Bazzanella et al., 2023). However, it is also essential to obtain the perspectives of core stakeholders, namely organizers and investors, to define the long-term legacy of event tourism (Ruhanen, 2009). This paper aims to fill this gap by examining how small-scale, specialized Greek events affect local tourism growth and destination sustainability. It gathers in-depth insights directly from event organizers regarding their strategic goals, partnerships, obstacles and results, focusing particularly on the strategic contribution of the events to destination sustainability.

Research Aim and Research Questions

This study uses a qualitative methodology (specifically semi-structured interviews) to explore the role of twelve diverse locally-driven small-scale events in Greek tourism development and sustainability. The events were purposively selected to represent a wide variety of contexts (different types and locations) to ensure broad applicability (Table 1). The research focused on interviewing the organisers of these events to gather in-depth data. Their selection was based on their central role and expertise in planning and implementing initiatives that contribute to local tourism growth.

Table 1

Summary of examined event cases

Epirus - Acheron Fest	Cultural Event for Local Heritage and Environment
Filippiada - Dino Day	Dinosaur-Themed Educational and Interactive Event for Kids and Families
Ioannina - Filyra Traditional Music Festival	Off-Season Athletic Event to Increase Local Tourism
Kalampaka - Climbing Festival	Adventure Sports Tourism Event in Meteora
Kavala - Cosmopolis Festival	Cultural Festival with music, dance, gastronomy and exhibitions
Kilkis - Night Half Marathon	Off-Season Athletic Event
Kilkis - Piroshki Competition	Pontic Community Cultural-Gastronomic Event
Serres - Horseback Riding Gathering	Amateur Riding Competition

Serres – Lake Kerkini Activities	Nature and Outdoor Event Series
Serres – Music and Art festival	Modern Youth Culture Through Music and Visual Arts
Serres – Serexpo	Local Products, Cuisine and Entrepreneurship with a Tourism Dimension
Voio - Fiesta	Youth Cultural Festival

Source: authors' own development

The following research questions guided the study:

- What managerial approaches do organisers employ to ensure the sustainability of their locally-driven events?
- How do event organisers develop partnerships and collaborations with local businesses?
- What kind of challenges do they face during the planning and execution stages of these events from a managerial perspective?

The thematic analysis that followed revealed key patterns related to the management strategies employed by organisers, the economic mechanisms activated through their events and the nature of their collaborations with local stakeholders.

Research Results

The findings emphasised the managerial role of event organisers in achieving sustainable tourism outcomes at the local level. The following five domains emerged from the thematic analysis:

Strategic Positioning: Events are intentionally framed as platforms for promoting local identity and showcasing destination assets, while also reinforcing both cultural heritage and tourism appeal. Organisers leverage storytelling and culture to position their events as authentic tourism experiences, apart from just entertainment. For example, local events like Cosmopolis and Acheron Fest incorporate local narratives and natural heritage to enhance the destination's tourism image.

Resource Mobilisation: Financial scarcity is a consistent issue; however, organisers often rely on volunteerism, in-kind contributions and creative partnerships. These approaches are essential not only for sustaining the event operations but mainly for ensuring continuity.

Stakeholder Collaboration: Municipalities, chambers of commerce, cultural associations, and local producers are key allies for locally driven event organisers. Collaborative marketing actions, such as joint promotional campaigns, enhance both the event's appeal and regional tourism goals. Events like the SEREXPO illustrate how these kinds of partnerships have their own economic and tourism footprint on the destination.

Continuity and Legacy: Events embedded in annual cultural calendars or connected to broader narratives (e.g., gastronomy, heritage, nature) generate long-term tourism benefits. Thus, they become destination assets, not just isolated or one-off occurrences.

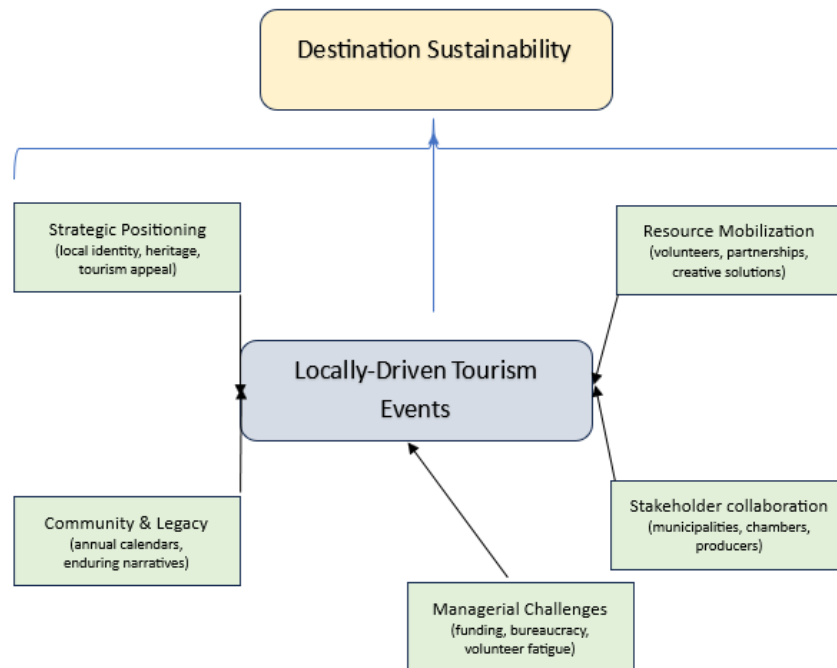
Managerial Challenges: Despite the events' strategic importance, organisers face persistent barriers. These may include limited funding, bureaucratic procedures, and volunteer fatigue, all of which can even constrain long-term strategic planning. Yet, their adaptive management responses demonstrate resilience and commitment to sustainability.

The empirical findings were synthesised into a conceptual framework (Framework 1) that illustrates how locally driven events act as vehicles for destination sustainability, based on organisers'

viewpoints. Each dimension highlights not only *what* organisers accomplish (e.g., positioning the destination and creating a legacy) but also *how* these practices balance community goals with sustainable tourism impacts despite persistent managerial challenges.

Figure 1

Managerial and Marketing Pathways to Destination Sustainability through Local Tourism Events



Source: author(s) own development

Conclusions

In conclusion, this study confirms that locally-driven events are vital instruments for sustainable tourism development in Greece. Our findings suggest that these initiatives are not just local gatherings, but they can also become strategic agents of the destinations when appropriately managed. Organisers' ability to reposition the destination constantly demonstrates that strategic management practices developed locally can lead to long-term value of event tourism. Future research could expand on these findings by testing the conceptual framework quantitatively to validate the relationships between strategic management practices and sustainable outcomes across a larger sample of events and organisers.

References

- Bazzanella, F., Schnitzer, M., Peters, M., & Bichler, B. F. (2023). The role of sports events in developing tourism destinations: A systematized review and future research agenda. *Journal of Sport Tourism*, 27, 77-109. <https://doi.org/10.1080/14775085.2023.2186925>
- Daniels, M. J., & Norman, W. C. (2003). Estimating the economic impacts of seven regular sport tourism events. *Journal of Sport & Tourism*, 8(4), 214-222. <https://doi.org/10.1080/1477508032000161528>

- Gibson, H. J., Kaplanidou, K., & Kang, S. J. (2012). Small-scale event sport tourism: A case study in sustainable tourism. *Sport Management Review*, 15(2), 160–170. <https://doi.org/10.1016/j.smr.2011.08.013>
- Gkarane, S., Gianni, M., & Vassiliadis, C. (2024). Running toward sustainability: Exploring off-peak destination resilience through a mixed-methods approach–The case of sporting events. *Sustainability*, 16(2), 576. <https://doi.org/10.3390/su16020576>
- Gkarane, S., Papanikolaou, Z., Goulas, A., & Tsotsas, I. (2025). The economic impact and business management of small-scale running events: A strategic approach. In *World Conference on Emerging Science, Innovation and Policy 2025*. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15833702>
- Gkarane, S., & Vassiliadis, C. (2024). Breaking the seasonality barrier in tourism: A literature review of policies and strategies. In *The International Conference on Strategic Innovative Marketing and Tourism* (pp. 211–218). Springer, Cham.
- Goulas, A. (2025). A novel study on the impact of a small-scale sport event on local economy and local communities. *Futurity of Social Sciences*, 3(1), 107–125. <https://doi.org/10.57125/FS.2025.03.20.07>
- Goulas, A., Tsotsas, I., Gkarane, S., & Papanikolaou, Z. (2025). Management approaches of agricultural enterprises in mountainous disadvantaged areas: The case of Agrafa. In *World Conference on Emerging Science, Innovation and Policy 2025*. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15844867>
- Gursoy, D., Kim, K., & Uysal, M. (2004). Perceived impacts of festivals and special events by organizers: An extension and validation. *Tourism Management*, 25(2), 171–181. [https://doi.org/10.1016/S0261-5177\(03\)00092-X](https://doi.org/10.1016/S0261-5177(03)00092-X)
- Melo, R., Andrade, C. S., Van Rheenen, D., & Sobry, C. (2021). Portugal: Small-scale sport tourism events and local sustainable development–The case of the III Running Wonders Coimbra. In *Small-scale sport tourism events and local sustainable development: A cross-national comparative perspective* (pp. 173–190).
- Papanikolaou, Z., Goulas, A., & Tsotsas, I. (2025). Business process management: A review and evaluation. In *International Conference on Next-Generation Innovations and Sustainability 2025*. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15091109>
- Ruhanen, L. (2009). Stakeholder participation in tourism destination planning: Another case of missing the point? *Tourism Recreation Research*, 34(3), 283–294. <https://doi.org/10.1080/02508281.2009.11081603>
- Tsotsas, I., Papanikolaou, Z., & Goulas, A. (2025). Emerging trends in business sustainability: A bibliometric analysis in innovation practices. In *International Conference on Next-Generation Innovations and Sustainability 2025*. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15098298>



Administrative Capacity for Project Pipeline Development and Management under Cohesion Policy in Albania

Sonil Bilaj^{1*}, Valeria Valeri²

¹ PhD Candidate, European University of Tirana, Director for the Administration of EU Financial Assistance at the State Agency for Strategic Programming and Aid Coordination (SASPAC), Prime Minister's Office, Albania

² Cohesion Policy Expert, Team Leader / Key Expert of EU funded assistance to Albania, Montenegro and Serbia on preparations for Regional Policy and Coordination of Structural Instruments



***Corresponding author:**

sonilbilaj1@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This paper defines and assesses the administrative capacity required to develop and manage a project pipeline for public investment implementation under the EU Cohesion Policy in Albania. The study aims to identify the institutional, regulatory, and organisational readiness of Albanian authorities to meet the EU Benchmark related to the project pipeline of public investments under Chapter 22 of the accession negotiations. Using a methodological approach that combines literature review, regulatory and institutional analysis, and a targeted survey among authorities implementing the Western Balkans Investment Framework, the paper evaluates the current state of administrative capacity at both "upstream" and "downstream" levels of the investment cycle. Results show that, while Albania has established the necessary legal and coordination frameworks, significant gaps remain in project preparation and evaluation capacity. The findings underscore the necessity for a systematic approach to define and evaluate the adequacy of human, technical, and financial resources for the development and implementation of a comprehensive project pipeline. Strengthening these capacities is crucial to ensure the effective absorption of Cohesion Policy funds and to enhance the overall efficiency of public investment management in Albania.

KEYWORDS: Public Investment, Public Investment Management, Project Pipeline, Administrative Capacity, Cohesion Policy.

How to cite: Bilaj, S., & Valeri, V. (2025). Administrative Capacity for Project Pipeline Development and Management under Cohesion Policy in Albania. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 181-187). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17538868>

Introduction

Pipelines of infrastructure projects, or simply “project pipelines”, are a common concept in infrastructure planning and investment discussions. The term “pipeline” is often used to highlight specific, upcoming investment opportunities. To date, no formal definition exists for a project pipeline, nor has there been a comprehensive examination of the concept of a pipeline. The Organisation for Economic Co-operation and Development (OECD) states that, based on expert interviews, discussions, and a review of the literature, the predominant view among governments and the investment community is that a project pipeline takes the form of a list of projects at an advanced stage in the development process, and that it should be published or communicated publicly in some way. (Organisation for Economic Co-operation and Development (OECD), 2019) , (OECD, 2018)

Infrastructure plays an increasingly important role in the economic and social development of all countries. The multiannual programming of EU-funded Cohesion Policy (European Commission, 2019) (European Commission, 2020), as well as investments financed under the Recovery and Resilience Facility (European Parliament and Council, 2021), has been a major driver for integrating public investment into medium-term budgetary frameworks and public financial management structures. The institutional arrangements for managing public investments vary across the European Union, presenting specific strengths and challenges (Ruiz Rivadeneira & McMaster, 2023). Integrated strategic planning and methods of project appraisal and selection that guide budget allocation effectively are crucial for efficiently carrying out public investment. One recent study states that “While wide-ranging reforms to systems for managing public investment have been implemented in several Member States, there is still room for improvement in many others. One recommendation for policymakers is to include in the negotiation package on the EU budget a process to benchmark the mechanisms Member States have in place for selecting national and EU investment opportunities” (Schout, 2024). A study conducted by the European Commission has identified several factors for the effective delivery of Cohesion Policy and the management of EU funds, which are compatible with efficient public investment management. These include administrative capacity, although gaps in this area are not specifically studied at the “upstream” and “downstream” levels of the investment cycle (Belu Mănescu, Public investment management in the EU: Key features and practices, 2021).

Since December 2022, Albania has established a comprehensive regulatory framework for public investment management, which includes detailed procedures and rules for identifying, preparing, proposing, evaluating, implementing, and monitoring public investment projects. However, according to the European Commission, challenges remain as of June 2025: “The planning and execution of public investment projects continue to face significant obstacles in the form of capacity constraints, incomplete project proposals, delays and cost overruns, as well as an occasional lack of adherence to procedures. The recurrent under-execution in capital spending is a clear indication that shortcomings exist in the operationalisation of the new legal framework” (European Commission, 2025).

Research Aim and Research Questions

The main aim of this study is to define and assess the administrative capacity required to develop and manage a project pipeline for public investments under the EU Cohesion Policy in Albania. The research focuses on assessing how Albania can meet the EU Benchmark related to the project pipeline of public investments under Chapter 22 of the accession negotiations through an analysis of its institutional, regulatory, and organisational frameworks and capacities.

Accordingly, the study seeks to answer the following key research questions:

1. What constitutes adequate administrative capacity of the country ecosystem (Schneidewind & Prizzon, 2024) for developing a project pipeline of public investments under the Cohesion Policy framework?
2. To what extent is Albania prepared to meet the EU Benchmark on the readiness of its public investment project pipeline?
3. What capacity gaps exist at the upstream and downstream levels of the public investment cycle, and how can they be addressed?

These questions guide the analytical framework of the paper, ensuring that the discussion directly addresses the identified policy and institutional challenges.

Research Results and Discussion

Preparations by Albania for implementing Cohesion Policy funding after accession are ongoing and will continue both before and after the accession date, which has not yet been formally set. These preparations are guided by conditions – termed “Benchmarks” – set by the European Union Common Position for each Negotiating Cluster of the accession negotiations and the respective Chapters. As of October 2025, Benchmarks have been set by the European Union for five Clusters, including 28 Chapters, out of a total of six Clusters and 33 Chapters. It is expected that the last Cluster – Cluster 5, which includes the remaining five Chapters – will be opened by the end of 2025. Cluster 5 includes Chapter 22 on 22, “Regional Policy and Coordination of Structural Instruments,” which focuses on the requirements implementing Cohesion Policy funds after accession.

The draft Common Position for Cluster 5, dated 3 September 2025, sets out six Benchmarks that Albania must fulfil to provisionally close Chapter 22 of the accession negotiations. One of these Benchmarks requires that: “Albania submits to the Commission a comprehensive and good quality draft project pipeline for implementation under Cohesion Policy. This draft should clearly demonstrate the availability of sufficient resources for the preparation and execution of the project pipeline.” This condition highlights the importance of having a comprehensive project pipeline in place at the start of Cohesion implementation to ensure the swift drawdown of Cohesion funds and prevent the decommitment of EU funds. However, the concept of ‘readiness’ is multifaceted. It refers to investment

that is identified, prepared and selected through appropriate criteria and mechanisms, as well as the financial resources and capacities that the administration should demonstrate at both the “upstream” and “downstream” levels of the investment cycle.

Importantly, although the share of EU-funded public investment in total public investment is expected to be high after accession, Albania is not planning to establish a dual public investment management system – one for domestic funds and one for EU Cohesion Policy funds. Consequently, the definition and assessment of administrative capacity for the project pipeline for Cohesion Policy is a forward-looking exercise, encompassing the overall capacity of the administration to manage public investment in sectors eligible under the post-2028 Cohesion Policy.

To define and assess administrative capacity for developing a Project Pipeline for Public Investment Implementation under Cohesion Policy in Albania, the study draws on an analysis of the relevant literature on public investment management, with a particular focus on public investment management under Cohesion Policy and Recovery and Resilience Facility funding, and good practice in EU Member States. It then considers the current baseline in Albania by reviewing the regulatory, institutional, and organisational framework, as well as published independent assessments of the effectiveness of public investment management. It also identifies current gaps at the “upstream” and “downstream” levels of the investment cycle through a survey conducted with a sample of authorities implementing public investment management under the EU Western Balkans Investment Framework, in the context of preparing the Roadmap for Administrative Capacity Building for Cohesion Policy. This survey builds on the approach tested in a recent Commission review of evidence on public investment management practices in all EU Member States (Belu Mănescu, 2022), and includes a glossary of the relevant terminology. Finally, it proposes a methodology for defining and identifying the resources required to prepare and execute the project pipeline, as well as assessing their sufficiency, as required under the aforementioned Benchmark.

Figure 1 below outlines the factors identified by the European Commission and EU Member States for the effective delivery of Cohesion Policy. The study analyses these factors in relation to public investment management to provide a more granular analysis of the required administrative capacity at the strategic planning, identification, selection, prioritisation, medium-term budgeting, and preparation stages (upstream level), down to the execution of the budget through public procurement, monitoring, control, audit and ex-post reviews (downstream level). One limitation of the analysis is that the sample includes a small percentage of local self-government units, given their limited participation in the EU Western Balkans Investment Framework mechanism.

Figure 1

Factors for effective delivery of Cohesion Policy



Source: (Belu Mănescu, Public investment management in the EU: Key features and practices, 2021)

Note: The axis shows the number of countries where the respective factor is present. Only factors identified in at least two countries are shown.

Conclusions and Recommendations

The analysis confirms that administrative capacity for implementing public investment under the Cohesion Policy in Albania is mainly developed at the downstream level. However, even at this level, there is insufficient evaluation of budgetary efficiency and the socio-economic impact of public investment.

At the upstream level, the regulatory, institutional, and coordination framework is in place; however, the administrative capacity of individual beneficiary institutions is underdeveloped, particularly at the investment preparation stage.

To ensure that the Benchmark for Chapter 22 is met and, most importantly, to guarantee that

public investment management becomes increasingly efficient and impactful, thereby tangibly contributing to the country's sustainable development, the study recommends that:

The specific features of an effective public investment management system in Albania are reviewed based on good practices observed in EU Member States, to improve public investment management and enhance its effectiveness.

Improvements to the current regulatory, institutional, coordination, and organisational framework are implemented in accordance with the defined public investment model.

The resources required to prepare and execute the project pipeline are defined, and their organisational, technical, and financial sufficiency are assessed using a robust methodology as proposed in this study.

References

- Belu Mănescu, C. (2021, December). Public investment management in the EU: Key features and practices. *Discussion Paper*. Retrieved from https://economy-finance.ec.europa.eu/system/files/2022-10/dp154_en.pdf
- Belu Mănescu, C. (2022, December 7). New evidence on the quality of public investment management in the EU. *European Commission Discussion Paper*. Retrieved from https://economy-finance.ec.europa.eu/publications/new-evidence-quality-public-investment-management-eu_en
- European Commission. (2019). *Country reports. Annex D - Investment guidance on Cohesion Policy funding 2021-2027*. Brussels: European Commission. Retrieved from https://commission.europa.eu/publications/2019-european-semester-country-reports_en
- European Commission. (2020). *European Semester 2020: Overview of investment guidance on the Just Transition Fund 2021-2027 per Member State (Annex D)*. Brussel: European Commission. Retrieved from https://commission.europa.eu/system/files/2020-02/annex_d_crs_2020_en.pdf
- European Commission. (2025). *2025 Economic Reform Programmes of Albania, Bosnia and Herzegovina, Kosovo*, Moldova, Montenegro, North Macedonia, Serbia and Türkiye: The Commission's overview and country assessments*. Brussels: Directorate-General for Economic and Financial Affairs (European Commission). Retrieved from https://economy-finance.ec.europa.eu/publications/2025-economic-reform-programmes-albania-bosnia-and-herzegovina-kosovo-moldova-montenegro-north_en
- OECD. (2018). *Developing robust project pipelines for low-carbon infrastructure*. Paris: OECD Publishing. doi:<https://doi.org/10.1787/9789264307827-en>
- Organisation for Economic Co-operation and Development (OECD). (2019). *Effective public investment across levels of government: Implementing the OECD principles*. Paris: OECD Centre for

Entrepreneurship, SMEs, Regions and Cities. Retrieved from <https://www.oecd.org/content/dam/oecd/en/about/projects/cfe/effective-public-investment-toolkit/oecd-public-investment-implementation-brochure.pdf>

Ruiz Rivadeneira, A., & McMaster, P. (2023). *Mapping institutional arrangements for infrastructure governance in OECD countries*. OECD Publishing. doi:<https://doi.org/10.1787/31825d0d-en>

Schneidewind, S., & Prizzon, A. (2024). *Scaling up high-quality project pipelines: What role for multilateral development banks?* London: ODI (Overseas Development Institute). Retrieved from https://media.odi.org/documents/Scaling_up_high-quality_project_pipelines.pdf

Schout, A. (2024). *The EU budget and the national capacity to investment*. The Hague: Clingendael Institute. Retrieved from https://www.clingendael.org/sites/default/files/202412/Clingendael_Policy_Brief_The_EU_budget_0.pdf



Integrating Design for Manufacturing, Assembly, and Disassembly to Accelerate Circular Economy in Construction: A Conceptual Framework

Thuy Binh Pham¹

¹MSc, Lecturer, Hanoi University of Civil Engineering, Vietnam

✉ **Corresponding author:**
binhpt2@huce.edu.vn



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: The construction industry continues to rely on linear “take-make-dispose” models that generate significant waste and resource inefficiency. This paper proposes a conceptual framework integrating Design for Manufacturing and Assembly (DFMA) and Design for Disassembly (DFD) to accelerate the transition toward circular construction. Using a conceptual-illustrative approach, the study synthesises key insights from design theory and circular economy principles to explain how DFMA enhances production efficiency while DFD ensures material recoverability and reuse. The proposed framework connects design efficiency, material value retention, and policy readiness through enabling mechanisms such as modular standardisation and digital modelling. Findings indicate that integrating DFMA and DFD redefines efficiency from linear productivity to regenerative value creation, transforming buildings into dynamic material banks. The study concludes that design integration offers a strategic pathway for developing economies, such as Vietnam, to achieve industrialised, low-carbon, and circular construction systems.

KEYWORDS: DFMA, DFD, Life Cycle, Sustainable Construction, Circular Economy, Vietnam.

How to cite: Pham, T. B. (2025). Integrating Design for Manufacturing, Assembly, and Disassembly to Accelerate Circular Economy in Construction: A Conceptual Framework. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 188-194). Futurity Research Publishing. <https://doi.org/10.5281/10.5281/zenodo.17538946>

Introduction

The construction industry remains one of the world’s most resource-intensive and environmentally burdensome sectors. Despite recent advances in digitalisation and green building

technologies, the prevailing linear model of “take-make-dispose” continues to dominate project delivery. Globally, construction and demolition activities account for a massive share of total solid waste generation and consume over 30% of extracted raw materials (Benachio et al., 2020). This linear pattern not only accelerates resource depletion and landfill saturation but also undermines the long-term retention of value within the built environment. In developing economies such as Vietnam, the situation is exacerbated by rapid urbanisation, fragmented supply chains, and limited mechanisms for material recovery, resulting in a “build-and-discard” culture that contradicts sustainability ambitions (Van Tuan et al., 2018).

Against this backdrop, Design for Manufacturing and Assembly (DFMA) and Design for Disassembly (DFD) emerge as transformative design philosophies that can bridge the gap between industrial efficiency and circular resource management. Originally conceived within the manufacturing sector, DFMA aims to optimise products for simplified fabrication and assembly, thereby reducing material waste, labour costs, and on-site variability (Bock, 2015). When applied to construction, DFMA promotes standardisation, modularisation, and off-site production, enabling faster, safer, and more predictable project delivery. Complementing this approach, DFD extends design consideration to the end-of-life stage by facilitating selective disassembly, reuse, and recycling of building components (Akinade et al., 2017). Together, DFMA and DFD encapsulate a “whole-life design logic”, ensuring that efficiency in manufacturing is matched by recoverability at the end of life.

However, despite growing recognition of their environmental and operational benefits, the integration of DFMA and DFD remains conceptually fragmented. The two design paradigms are often treated in isolation—DFMA within discussions of productivity and cost reduction, and DFD within the domain of sustainability and waste minimisation (Hossain & Ng, 2018). This separation has led to a lack of systemic frameworks that connect early-stage design optimisation with end-of-life material recovery, both of which are essential to achieving the Circular Economy (CE) vision for the built environment. While circular construction emphasises material loops and resource efficiency, most research and policy instruments focus on recycling or material substitution rather than the design integration mechanisms that make circularity practically achievable (Eberhardt et al., 2022).

Moreover, current literature provides limited insight into how DFMA-DFD integration transforms the economic and institutional logic of construction systems. The dominant discourse still frames DFMA as a productivity tool rather than as an enabler of circularity. In contrast, a growing body of international work highlights the potential of design integration – supported by digital modelling (BIM), product data traceability, and modular standardisation – to generate circular value chains where buildings function as material banks (de Lima et al., 2023). Yet, for many developing contexts, such as Vietnam and other Southeast Asian nations, the lack of regulatory incentives, digital capabilities, and disassembly-friendly codes continues to hinder the transition from linear to circular construction.

Accordingly, this paper seeks to address this research gap by developing a conceptual framework that links DFMA-DFD integration with the principles and enablers of Circular Construction.

Through a comprehensive literature review, the study synthesises the interrelations among design standardisation, manufacturing efficiency, and life-cycle material recovery. It argues that integrating DFMA and DFD at the design stage can reconfigure construction economics from one based on throughput and extraction to one centred on resource regeneration and value retention. By articulating this integration, the paper contributes to the emerging discourse on industrialised and circular construction— a paradigm essential to achieving both decarbonization and resource circularity in the global built environment.

Research Aim, Questions and Approach

This study aims to develop a conceptual framework that explicates how the integration of DFMA and DFD can accelerate the transition from linear to circular construction systems. By synthesising insights from design science, construction economics, and circular economy literature, the study elucidates the mechanisms through which design integration influences material efficiency, value recovery, and systemic transformation.

To achieve this aim, the study addresses three interrelated research questions (RQs):

RQ1: How do DFMA and DFD, respectively, contribute to the principles and outcomes of circular construction across different life-cycle stages?

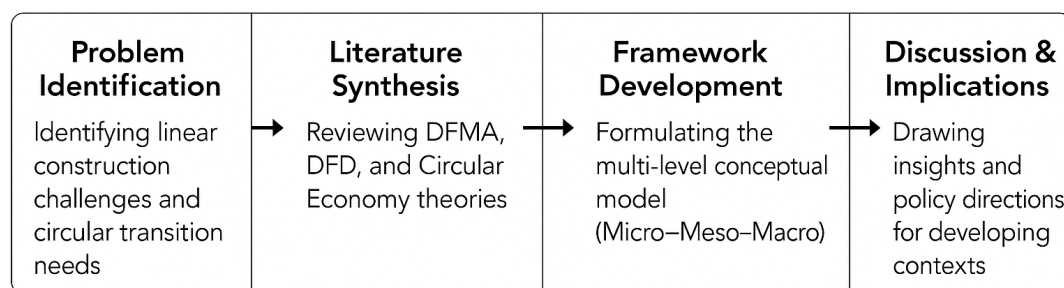
RQ2: Through what design, technological, and organisational mechanisms does the integration of DFMA-DFD enable value retention and resource circulation within the built environment?

RQ3: What are the key institutional, policy, and capability factors that condition the successful adoption of DFMA-DFD integration in developing construction markets such as Vietnam?

The research process is outlined in Figure 1.

Figure 1

Research process



Source: author(s) own development

This study employs a four-step conceptual and illustrative research approach. It begins with synthesising insights from DFMA, DFD, and Circular Economy literature, followed by the development of a multi-level conceptual framework that illustrates the mechanisms qualitatively. Finally, it discusses theoretical and policy implications for circular construction in developing contexts.

Theoretical Background

Design for Manufacturing and Assembly (DFMA) and Design for Disassembly (DFD) originate from the broader “Design for X” paradigm, which aims to optimise products for efficient production, assembly, and end-of-life management. In construction, DFMA shifts conventional on-site, craft-based processes toward industrialised, off-site production through modularisation, standardisation, and digital design (Montazeri et al., 2024). The approach enhances productivity, minimises waste, and enables precise, repeatable assembly—key characteristics of industrialised and sustainable construction systems.

Complementing DFMA, DFD extends the design horizon beyond production to material recovery and reuse. By anticipating disassembly, DFD ensures that components can be separated without damage, reused, or remanufactured for future use. This principle transforms buildings into dynamic material banks, where materials retain value across multiple life cycles (Akbarieh et al., 2020). Non-destructive connections, reversible joints, and digital documentation—such as BIM and material passports—enable traceability and facilitate closed-loop material flows.

When integrated, DFMA and DFD form a closed-loop design continuum that connects manufacturing efficiency with end-of-life recoverability. DFMA reduces waste and cost during construction (Rethink-Reduce in the 9R hierarchy), while DFD promotes reuse, refurbishment, and recycling (Reuse-Refurbish-Remanufacture-Recycle). Their combination operationalises circularity not as a post-construction process but as a design principle embedded from project inception.

Within Circular Economy (CE) theory, the built environment is recognised as both a major resource consumer and a key driver of systemic transformation (Ellen MacArthur Foundation, 2021). Circular construction operates across micro (project), meso (firm/supply chain), and macro (policy/system) levels (Hart et al., 2019). DFMA-DFD integration links these scales by translating policy goals into design strategies and industrial capabilities. At the project level, it fosters modular adaptability; at the supply chain level, it enables collaboration and material traceability; and at the policy level, it aligns design innovation with regulatory frameworks.

However, significant barriers remain. Construction procurement remains fragmented, with regulations rarely addressing disassembly, and the valuation of recovered materials is limited. Without supportive standards or economic incentives, DFMA-DFD practices remain isolated innovations. Digital technologies, such as BIM and Digital Twins, offer crucial infrastructure for managing design data and lifecycle traceability; however, their adoption in developing contexts is still in its early stages.

Theoretically, integrating DFMA and DFD signifies a shift from linear efficiency to regenerative efficiency—from maximising output to maximising value retention. This redefinition aligns with sustainability transition theory, suggesting that design integration is both a technical and institutional innovation. By merging the industrial logic of DFMA with the regenerative logic of DFD, construction can evolve into a circular, low-carbon, and data-driven ecosystem. This conceptual understanding provides the foundation for the next section, which introduces a framework linking DFMA-DFD

integration with circular construction outcomes in emerging economies.

Research Results

This paper adopts a conceptual-illustrative approach to develop a multi-level framework that explains how DFMA-DFD integration drives circular construction. The framework aligns with the three-tier structure of the Circular Economy (CE) – micro, meso, and macro levels–highlighting how design integration scales from project practice to institutional transformation. Rather than an exhaustive review, the study draws on core literature in design theory, manufacturing, and circular construction to synthesise a unified model.

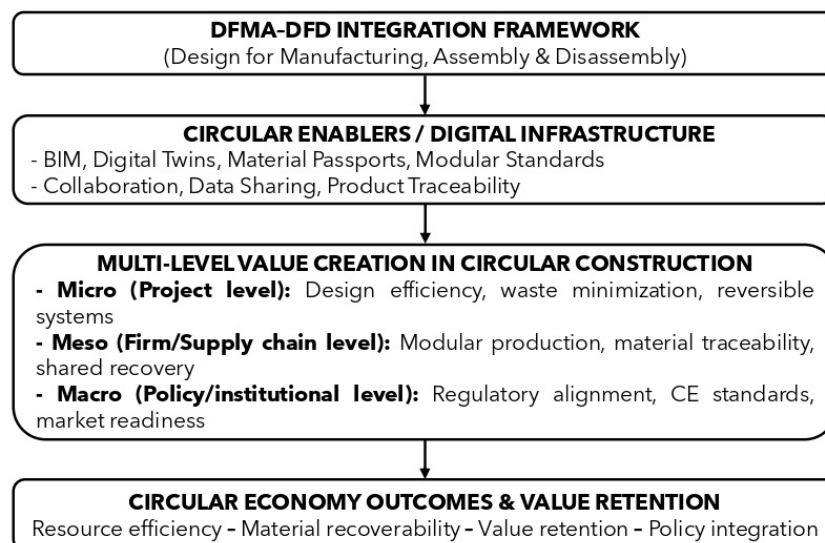
At its core, the framework conceptualises DFMA-DFD integration as the starting point that links design logic with circular outcomes through digital and organisational enablers such as Building Information Modelling (BIM), Digital Twins (DT), material passports, and modular standards. These digital infrastructures enable collaboration, data exchange, and material traceability across life-cycle stages and between industry actors.

The framework operates across three interconnected levels:

- Micro (Project level): DFMA enhances constructability, reduces material waste, and enables modular assembly; DFD ensures selective disassembly and reuse.
- Meso (Firm/Supply chain level): DFMA promotes mass customisation and shared component standards; DFD enables inter-firm material recovery and tracking across projects.
- Macro (Policy/institutional level): Aggregated DFMA-DFD data support policy design, CE regulation, and resource planning for recycled material markets.

Figure 2.

Multi-Level Conceptual Framework Linking DFMA-DFD Integration with Circular Construction Outcomes



Source: author(s) own development

This conceptual model provides a heuristic foundation for future empirical studies. It links design innovation with systemic change, clarifying how micro-level efficiency, meso-level coordination, and macro-level governance interact to achieve regenerative, low-carbon construction systems.

This conceptual approach provides a theoretical basis for future empirical inquiry. It can guide researchers in testing relationships between DFMA-DFD integration and circular performance indicators such as waste reduction, cost efficiency, and material recovery rates. For policymakers and practitioners, the framework provides a structured approach for integrating circular design principles into national standards, procurement systems, and training programs, particularly in developing construction markets such as Vietnam.

Discussion

The proposed framework illustrates how DFMA-DFD integration functions as a design-driven engine of circularity across three interdependent tiers.

At the micro level, DFMA optimises design and assembly to reduce waste and improve constructability. DFD complements this by ensuring that components can be dismantled and reused later. Together, they internalise the 9R strategies—Rethink, Reduce, Reuse, and Remanufacture—within project design, turning efficiency into regenerative value.

At the meso level, DFMA-DFD integration extends to firm and supply-chain collaboration. Standardised modules, interoperable data formats, and digital twins enable shared logistics and recovery networks. This level represents the operational bridge where digital traceability and collaborative production translate design efficiency into tangible circular flows of materials and components.

At the macro level, DFMA-DFD integration provides policymakers with the data infrastructure needed to develop CE-aligned regulations, material recovery markets, and fiscal incentives. For example, national digital construction policies—such as Vietnam’s Decision No. 926/QĐ-BXD (2024)—can embed DFMA-DFD criteria within BIM mandates and green building codes to institutionalise circular design practices.

Collectively, these three levels reveal that circular construction is not achieved solely through end-of-life waste management, but rather through the integration of systemic design. DFMA initiates efficiency; DFD closes the loop; digital technologies connect the entire value chain. The result is a regenerative construction ecosystem where projects, firms, and institutions co-evolve toward industrialised and circular outcomes.

Conclusions

This study develops a conceptual framework illustrating how the integration of Design for Manufacturing and Assembly (DFMA) and Design for Disassembly (DFD) can accelerate circular construction. Using a conceptual-illustrative approach, it identifies three interrelated dimensions—design efficiency, material recoverability, and policy readiness—as the foundations for transforming

linear construction into regenerative systems. DFMA promotes industrialised efficiency through modularisation and waste reduction, while DFD ensures value recovery by enabling selective disassembly and component reuse. Supported by digital tools such as BIM and material passports, DFMA-DFD integration redefines efficiency from rapid production to sustained value retention.

The framework contributes theoretically by linking industrial productivity and circular sustainability, offering practitioners a guide to embed circularity at the design stage. For policymakers, it underscores the need for standards, incentives, and digital infrastructure to facilitate widespread adoption. Overall, DFMA-DFD integration represents a design-led pathway for achieving industrialised, low-carbon, and circular construction in emerging economies.

References

- Akbarieh, A., Jayasinghe, L. B., Waldmann, D., & Teferle, F. N. (2020). BIM-based end-of-lifecycle decision making and digital deconstruction: Literature review. *Sustainability*, 12(7), 2670.
- Akinade, O. O., Oyedele, L. O., Ajayi, S. O., Bilal, M., Alaka, H. A., Owolabi, H. A., Bello, S. A., Jaiyeoba, B. E., & Kadiri, K. O. (2017). Design for Deconstruction (DfD): Critical success factors for diverting end-of-life waste from landfills. *Waste management*, 60, 3-13.
- Benachio, G. L. F., Freitas, M. d. C. D., & Tavares, S. F. (2020). Circular economy in the construction industry: A systematic literature review. *Journal of cleaner production*, 260, 121046.
- Bock, T. (2015). The future of construction automation: Technological disruption and the upcoming ubiquity of robotics. *Automation in construction*, 59, 113-121.
- de Lima, P. R. B., de Souza Rodrigues, C., & Post, J. M. (2023). Integration of BIM and design for deconstruction to improve circular economy of buildings. *Journal of Building Engineering*, 80, 108015.
- Eberhardt, L. C. M., Birkved, M., & Birgisdottir, H. (2022). Building design and construction strategies for a circular economy. *Architectural Engineering and Design Management*, 18(2), 93-113.
- Hart, J., Adams, K., Giesekam, J., Tingley, D. D., & Pomponi, F. (2019). Barriers and drivers in a circular economy: the case of the built environment. *Procedia Cirp*, 80, 619-624.
- Hossain, M. U., & Ng, S. T. (2018). Critical consideration of buildings' environmental impact assessment towards adoption of circular economy: An analytical review. *Journal of cleaner production*, 205, 763-780.
- Montazeri, S., Lei, Z., & Odo, N. (2024). Design for manufacturing and assembly (DfMA) in construction: A holistic review of current trends and future directions. *Buildings*, 14(1), 285.
- Van Tuan, N., Kien, T. T., Huyen, D. T. T., Nga, T. T. V., Giang, N. H., Dung, N. T., Isobe, Y., Ishigaki, T., & Kawamoto, K. (2018). Current status of construction and demolition waste management in Vietnam: Challenges and opportunities. *GEOMATE Journal*, 15(52), 23-29.

Artificial Intelligence and Consumer Behaviour: A Bibliometric Review

Sarah Makraz^{1*}, Wadi Tahri²

^{1,2} LIRO-ENCG El Jadida, Morocco

✉ ***Corresponding author:**
smakraz@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This investigation provides a systematic mapping of the emerging field linking artificial intelligence to consumer behavior studies. A bibliometric analysis of 5,200 scientific publications, extracted from the Scopus database for the period 2008-2023, reveals an exponential growth in research since 2018. The results reveal a Sino-American dominance in knowledge production, characterised by a tripartite thematic structure centred on recommendation systems, conversational interfaces, and predictive analytics, as well as epistemological foundations grounded in behavioural theories and computational sciences. The study highlights the gradual emergence of ethical concerns as a structuring axis, offering a conceptual framework to guide responsible technological innovation.

KEYWORDS: Artificial Intelligence, Consumer Behaviour, Bibliometric Analysis, Algorithmic Personalisation, Digital Ethics, Digital Transformation.

How to cite: Makraz, S., & Tahri, W. (2025). Artificial Intelligence and Consumer Behaviour: A Bibliometric Review. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 195-198). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17539037>

1. Essence générale du problème

La révolution numérique, accélérée par le déploiement massif des technologies cognitives, a profondément reconfiguré les paysages économiques contemporains. L'intelligence artificielle émerge comme un catalyseur transformationnel, redéfinissant les modalités d'interaction entre les organisations et leur public (Kaplan & Haenlein, 2019). Dotées de capacités d'apprentissage autonome et d'analyse prédictive, ces technologies permettent désormais d'anticiper les attentes, de personnaliser les parcours et d'automatiser les processus décisionnels (Kumar et al., 2019).

Cette mutation technologique s'accompagne d'une reconfiguration des comportements d'achat et des attentes des consommateurs. Les interfaces intelligentes, les systèmes de recommandation et les assistants virtuels sont devenus des éléments centraux de l'expérience client moderne (Solomon, 2016). La récente crise sanitaire a accentué cette transition, accélérant l'adoption de solutions digitales et soulignant l'impérieuse nécessité pour les entreprises de maîtriser ces nouveaux leviers relationnels.

Face à cette accélération, la communauté scientifique a multiplié les investigations, créant un corpus de connaissances considérable mais éclaté. Cette recherche vise à structurer ce domaine en pleine effervescence grâce à une analyse bibliométrique systématique, offrant une vision macroscopique des dynamiques intellectuelles, des réseaux d'influence et des orientations futures.

2. Analyse des recherches et publications récentes

L'examen de la littérature existante met en lumière plusieurs dynamiques structurantes. La production académique connaît une croissance remarquable, portée par les avancées en apprentissage profond et leur intégration dans les stratégies commerciales (LeCun et al., 2015). Géographiquement, une polarisation sino-américaine se dessine nettement, reflétant les investissements massifs en faveur de l'innovation technologique.

Sur le plan conceptuel, trois courants majeurs émergent :

- L'optimisation des parcours clients par la personnalisation algorithmique (Kumar et al., 2019)
- Les enjeux d'acceptation des interfaces intelligentes (Davis, 1989)
- L'exploitation des données massives à des fins prédictives (Chaffey & Ellis-Chadwick, 2019)

Les fondements théoriques s'ancrent dans les modèles classiques d'acceptation technologique (TAM, théorie du comportement planifié) tout en intégrant les récentes avancées en science des données (Goodfellow et al., 2016). Cependant, des zones d'ombre persistent quant à l'impact réel des plateformes intelligentes sur les conversions, ainsi qu'à la variabilité culturelle dans l'adoption de ces technologies (Zuboff, 2019).

3. Formulation de l'objectif de l'article

Cette recherche poursuit un triple objectif :

- Cartographier l'évolution chronologique et la distribution géographique des publications scientifiques traitant des interfaces entre IA et comportement consommateur
- Identifier les thématiques structurantes et les concepts émergents through l'analyse de co-occurrence terminologique
- Révéler les fondements intellectuels through l'analyse des co-citations et des réseaux de collaboration scientifique

La démarche méthodologique s'appuie sur une analyse bibliométrique rigoureuse, exploitant la base de données Scopus. Le protocole de recherche a combiné les terminologies clés de

l'intelligence artificielle et du comportement des consommateurs, couvrant la période 2008-2023. Les données ont été traitées à l'aide d'outils spécialisés permettant l'analyse de co-occurrence, de co-citation et de collaboration internationale.

4. Présentation du matériel principal (résultats de la recherche)

4.1. Productivité et Répartition Géographique

L'analyse révèle une accélération notable des publications à partir de 2018, avec une domination nette des États-Unis (32 %) et de la Chine (28 %). Le Royaume-Uni complète ce podium avec 9% des contributions. Les chercheurs Kraus, S. et Novais, P. émergent comme les contributeurs les plus prolifiques.

4.2. Architecture Thématique

L'analyse lexicographique fait apparaître trois constellations conceptuelles :

- Personnalisation avancée: systèmes recommandation, apprentissage automatique, expérience client (Kumar et al., 2019)
- Interactions intelligentes: chatbots, confiance, éthique, protection des données (Kaplan & Haenlein, 2019)
- Prospective data-driven: big data, analytique prédictive, data mining (Chaffey & Ellis-Chadwick, 2019)

4.3. Fondements Épistémologiques

L'étude des co-citations dévoile une structure intellectuelle triadique :

- Pilier théorique : modèles comportementaux et théories marketing (Ajzen, 1991; Kotler, 2017)
- Pilier méthodologique : avancées en intelligence computationnelle (LeCun et al., 2015; Goodfellow et al., 2016)
- Pilier applicatif : transformations digitales et gestion relationnelle (Kumar et al., 2019; Chaffey & Ellis-Chadwick, 2019)

4.4. Réseaux de Collaboration

La cartographie des coopérations internationales révèle un écosystème centré sur les pôles américain et européen, avec la Chine formant un cluster distinct mais connecté.

5. Conclusions

Cette investigation bibliométrique contribue à une compréhension holistique du domaine unissant l'intelligence artificielle et le comportement du consommateur. Les résultats mettent en lumière une tension fondamentale entre l'optimisation opérationnelle et les considérations éthiques (Zuboff, 2019). La prédominance des thématiques marketing contraste avec l'émergence encore timide des questionnements déontologiques, ce qui signale une maturation progressive du champ.

La concentration géographique des productions interroge la diversité des perspectives académiques, tandis que la structuration thématique suggère une instrumentalisation marquée de l'IA au service de la performance commerciale (Kumar et al., 2019). Les limites méthodologiques, notamment le recours exclusif à Scopus, ouvrent des voies de recherche futures, incluant l'analyse comparative des cadres réglementaires et l'étude des déterminants culturels de l'adoption de l'IA (Solomon, 2016).

En révélant les dynamiques structurantes, les réseaux d'influence et les tensions conceptuelles, cette étude offre un cadre de navigation pour les recherches futures et un guide décisionnel pour les praticiens, participant activement au débat sociétal sur la régulation des technologies émergentes et l'équilibre entre innovation technologique et protection des droits des consommateurs.

Références Bibliographiques

- Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- Chaffey, D., & Ellis-Chadwick, F. (2019). *Digital Marketing* (7th ed.). Pearson Education.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
- Goodfellow, I., Bengio, Y., & Courville, A. (2016). *Deep Learning*. MIT Press.
- Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. *Business Horizons*, 62(1), 15-25.
- Kotler, P. (2017). *Principles of Marketing* (7th European ed.). Pearson Education.
- Kumar, V., Rajan, B., Venkatesan, R., & Lecinski, J. (2019). Understanding the role of artificial intelligence in personalized engagement marketing. *California Management Review*, 61(4), 135-155.
- LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. *Nature*, 521(7553), 436-444.
- Solomon, M. R. (2016). *Consumer Behavior: A European Perspective* (6th ed.). Pearson Education.
- Zuboff, S. (2019). *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. PublicAffairs.



Rethinking Agribusiness in the Digital Era

Apostolos Goulas^{1*}, Ilias Tsotsas², Zacharias Papanikolaou³, Maria Gianni⁴

¹Economist, Agricultural Economics, PhD, University of Thessaly, Greece

²Economist, Service design, PhD, International Hellenic University, Greece

³Agricultural Economics, PhD, Postdoctoral Researcher, Democritus University of Thrace, Greece

⁴Operations Management, PhD, Adjunct Lecturer, Hellenic Open University, Greece

✉ ***Corresponding author:**
goulasap@yahoo.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: The global agri-food system is under a significant transformation due to various factors, such as digital transformation, climate change, sustainability goals, technological innovation and consumer demands. The extensive use of technologies and innovations in agriculture, such as Artificial Intelligence, the Internet of Things, the Metaverse, robotics, and drones, is completely reshaping agriculture and traditional agribusiness models, value chains, and production practices. This change is going beyond specific technological modernisation and application. It is about a structural redefinition of how agricultural products are produced, distributed, managed and consumed. The present study aims to identify issues in agriculture and present best practices from Europe.

KEYWORDS: agribusiness, sustainability, agri-food systems, digital era, digital transformation.

How to cite: Goulas, A., Tsotsas, I., Papanikolaou, Z., & Gianni, M. (2025). Rethinking Agribusiness in the Digital Era. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 199-204). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17539191>

Introduction

Agricultural production and the agri-food system worldwide are currently facing many challenges (Goulas and Papachatzis, 2024). Rapid technological developments, the pressures of climate change, the need for sustainability and the growing global demand for food make it necessary to reconsider the way we understand and practice agribusiness. Climate change and environmental degradation are challenges that our world is facing today (Goulas et al., 2025a). As Annosi et al. (2024) point out, the development and diffusion of digital technologies are radically transforming productive

sectors, including agri-food, which is experiencing significant changes in the context of the so-called “digital agriculture”. Moreover, Tsotsas et al. (2025) emphasise the importance of adaptation for companies to adopt new and innovative approaches, thereby gaining a competitive advantage and enhancing their sustainability performance. It is crucial to understand that rural businesses play a key role in the economy and local resilience, as they are one of the main contributors to local resilience in both direct and indirect ways (Steiner & Atterton, 2015; Goulas et al., 2025b). Comparable evidence from regional economies shows that localised, community-driven initiatives can reinforce territorial resilience and diversify income structures (Gkarane, Vassiliadis, & Gianni, 2022).

Although digital technology is not a new phenomenon in agriculture (Shepherd et al., 2018), in recent years, there has been an intensification of the discussion around its impact on the formation of new business models and the reorganisation of agri-food value chains. Rethinking Agribusiness in the Digital Era is not just about introducing new tools, but a total redefinition of the way agricultural products are produced, managed, distributed, and consumed. It is a continuous process of transformation, based on production practices, business strategies, the organisation of agri-food value chains, and the relationship between producers and consumers (Goulas, 2022). Similar sustainability-driven restructuring pressures have been extensively documented in regions which face severe tourism seasonality and are vulnerable to climate change, where destination models are forced to adapt for regional resilience (Gkarane & Vassiliadis, 2020).

According to Li et al. (2023), digital technology has increased the willingness of many farmers to engage in entrepreneurial activities, providing them with access to new information, markets, and partnerships. The digital era has begun to radically transform the face of agriculture, opening new pathways for sustainable development and providing critical tools to address global challenges, such as food security and environmental protection (Xu et al., 2024).

In recent years, however, the need to reshape the agricultural sector has become even more urgent due to the outbreak of zoonotic diseases, the climate crisis and growing consumer preferences for local products. Agribusinesses are also vulnerable to externalities, such as energy crises, climate change, and consumer preferences (Goulas, 2025). In addition, modern consumers are becoming increasingly sceptical about the origin, quality and environmental footprint of food, demanding transparency, traceability and ethical production practices (Goulas, 2022). In this light, the integration of digital technologies is not only a technological development, but a prerequisite for the re-legitimisation of agricultural production vis-à-vis society and the market. Palmi and Lezzi (2020) argue that agribusiness can develop innovative strategies rooted in tradition in the context of sustainability. Making it the main topic for the agribusiness sector and its companies, to balance innovation, tradition and sustainability (Goulas, 2025; Papanikolaou et. al., 2025).

This transformation is actively supported by a network of European and national policies, which aim to accelerate the green and digital transformation of agriculture. The Common Agricultural Policy (CAP) 2023–2027 emphasises smart and sustainable agriculture, promoting investments in digital technologies, innovation, research and farmer training (European Commission, 2023). At the same

time, the European Green Deal, particularly the “Farm to Fork” and “Biodiversity 2030” strategies, enhances the environmental sustainability and resilience of food systems. These policies are actual catalysts for the integration of technology, enhancing competitiveness and ensuring a just transition for producers.

New digital technologies, such as the Internet of Things (IoT), Artificial Intelligence (AI), blockchain, robotics and big data analytics, are recognised as factors that can enhance productivity, transparency and resilience throughout the agri-food chain (Bello, 2024).

Beyond the technological dimension, the digitalisation of agriculture entails a socio-economic transformation. Access to data and digital marketing platforms enhances transparency and the connection between producers and markets, facilitating direct communication with consumers and the creation of trust-based relationships. At the same time, digitalisation promotes new forms of agricultural cooperation and business ecosystems, where knowledge and innovation act as key drivers of growth.

However, the success of this transition depends on the existence of the necessary digital skills, infrastructure and an appropriate institutional framework. Small and medium-sized farmers, who form the backbone of the European agricultural sector, need support to effectively integrate new technologies and remain competitive in a rapidly changing environment. This process of internal transformation resembles the challenges faced by companies pursuing sustainable excellence through the integration of management systems, where internalisation becomes a key success factor for long-term sustainability (Gianni & Gotzamani, 2024).

Overall, digital agriculture is not just a technological innovation, but a new business logic based on sustainability, knowledge and connectivity. Rethinking the agri-food system in the light of the digital transition paves the way for greener, more resilient and equitable rural development, fully aligned with the objectives of the European Green Deal and the 2030 Agenda for Sustainable Development.

Research Aim and Research Questions

This study aims to explore the ongoing transformation of the global agri-food system driven by digitalisation, sustainability imperatives, and technological innovation. Specifically, it aims to explore how emerging technologies—such as Artificial Intelligence, the Internet of Things, robotics, drones, and the Metaverse—are transforming traditional agribusiness models, value chains, and production practices. The study will also highlight successful examples and good practices from Europe that demonstrate effective adaptation to this transformation. The study aims to answer the following questions through the presentation and examination of specific good practices in Europe. How are digital and technological innovations transforming traditional agricultural practices and agribusiness models? How are European countries implementing innovative technologies to enhance sustainability and efficiency in agriculture? What good practices and policy approaches can be identified from Europe that support the structural redefinition of the agri-food sector?

Research Results

For the present study, three good practices from Europe will be presented. Each of the cases is unique, but they are all focused on integrating innovation, new technologies and agribusiness. The cases presented are AgriTech Ireland Cluster (Ireland), Smart Agro Hub (Greece) and Smart Rural 21 (EU).

AgriTech Ireland Cluster is a collaborative cluster designed to strengthen Ireland's agricultural technology sector. It provides a structured ecosystem where companies, universities, and policymakers cooperate to enhance innovation, training, and competitiveness. That specific cluster focuses on supporting small and medium-sized agribusinesses, promoting digital transformation, and accelerating the development of smart agricultural solutions. Automation, robotics and Internet of Things systems are among those solutions. It is worth noting that the inclusive and partnership-based approach serves as an example of how regional clusters can drive innovation in agri-food technology (<https://agritechireland.ie/>).

The Smart Agro Hub operates as a national centre of innovation and expertise in smart agriculture, connecting various research organisations with businesses and technological providers. Smart Agro Hub is based in Greece, with a primary goal of promoting digital and sustainable transformation within the Greek agri-food sector. The Smart Agro Hub strongly believes that this can be achieved through collaboration, applied research, and knowledge transfer. The union and collaboration of various stakeholders can bridge the existing gap between academic institutions and the market. That collaboration can lead to new business models, precision farming tools, and data-driven decision-making for modern agriculture (<https://smartagrohub.gr/>).

Smart Rural 21 is a European-supported initiative with the overall aim of promoting and inspiring villages to develop and implement smart village approaches and strategies across Europe. Additionally, the initiative aims to draw conclusions and support future policy interventions in smart villages. The Smart Rural 21 project is led by the E40 Group (Hungary). It includes the Institut für Ländliche Strukturforschung (IfLS, Germany), the Agricultural University of Athens (AUA, Greece), empirica (Germany), Innovatiesteunpunt (ISP, Belgium), and eConcepts (Ireland) as partners. The project was a two-and-a-half-year project, supported by the European Commission (DG AGRI), and ended in November 2022. The project provided mentoring, networking, and practical tools for the communities that participated in the project, enabling them to design and implement smart solutions tailored to their specific challenges. Through this process, Smart Rural 21 demonstrated how digitalisation and community engagement can lead to the creation of strong, vibrant and sustainable rural areas (<https://www.smartrural21.eu/>).

Conclusions

Text: The global agri-food system, as already mentioned, is under transformation. A transformation driven by globalisation, digital transition, technological innovation and sustainability initiatives. We are witnessing the daily application of emerging technologies in the agricultural sector,

including AI, IoT, robotics, drones, and the Metaverse. Those applications are reshaping the traditional agribusiness models, production methods, value chains, and even markets. As a result of those, there is the improvement of productivity, efficiency and environmental performance, precision farming and data-driven decision making. The various European initiatives, such as the European Green Deal and the Common Agricultural Policy, are leading the effort for a digital shift toward sustainability and resilience. The successful practices presented demonstrate how the adoption of smart technologies can support economic competitiveness while achieving ecological and social objectives. The digital transformation of agriculture demonstrates in action not only a technological revolution but also a structural and cultural change in the agribusiness and the agri-food sector in general.

References

- Annosi, M.C., Appio, F.P., Brenes, E.R., and Brunetta, F., (2024). Exploring the nexus of digital transformation and sustainability in agribusiness: Advancing a research agenda. *Technological Forecasting and Social Change*. Vol. 206, September 2024. <https://doi.org/10.1016/j.techfore.2024.123587>
- Bello, S. M., (2024). Digital transformation in agribusiness and agripreneurship. In book: *Agripreneurship and the Dynamic Agribusiness Value Chain*, p.p. 103 - 116. January 2024, https://doi.org/10.1007/978-981-97-7429-6_6
- European Commission, (2023). https://agriculture.ec.europa.eu/common-agricultural-policy_en
- Gianni, M., & Gotzamani, K. (2024). The internalisation of integrated management systems as a key for sustainable companies: empirical evidence. *Total Quality Management & Business Excellence*, 35(1-2), 273-296. <https://doi.org/10.1080/14783363.2023.2290659>
- Gkarane, S., & Vassiliadis, C. (2020). Selective Key Studies in Seasonality Tourism: A Literature Review. *Strategic Innovative Marketing and Tourism: 8th ICSIMAT, Northern Aegean, Greece*, 2019, 247-256.
- Gkarane, S., Vassiliadis, C. A., & Gianni, M. (2022). EXPLORING PROFESSIONALS' PERCEPTIONS OF TOURISM SEASONALITY AND SPORTS EVENTS: A QUALITATIVE STUDY OF KISSAVOS MARATHON RACE. *Enlightening Tourism. A Pathmaking Journal*, 12(3), 24-51. <https://doi.org/10.33776/et.v12i3.7175>
- Goulas, A., (2022). Special markets for local agro food products. *Annals of the university of Craiova, Biology, Horticulture, Food products processing technology, Environmental engineering*. Vol. 27, No. 63. <https://doi.org/10.52846/bihpt.v27i63.30>
- Goulas, A., (2025). Shaping agribusiness in the new digital era: Bridging tradition with innovation for the agribusiness in Thessaly Greece. *Economics and Business Quarterly Reviews*, 8(1), pp. 18 - 25. DOI: 10.31014/aior.1992.08.01.647

- Goulas, A., and Papachatzis, A., (2024). Farm to Fork Strategy: A sustainable solution for rural communities. *Annals of the University of Craiova, Biology, Horticulture, Food products processing technology, Environmental engineering*. Vol. 29, No. 54, pp. 209 - 214
<https://doi.org/10.52846/bihpt.v29i65.143>
- Goulas, A., Papanikolaou, Z., and Tsotsas, I., (2025). European Green Deal: Creating a New Agricultural Production Model. *International Conference on Next - Generation Innovations and Sustainability 2025*. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15099887>
- Goulas, A., Tsotsas, I., Gkarane, S., and Papanikolaou, Z., (2025b). Management Approaches of Agricultural Enterprises in Mountainous Disadvantaged Areas: The case of Agrafa. *World Conference on Emerging Science, Innovation and Policy 2025*. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15844867>
- Li, F., Zang, D., Chandio, A.A., Yang, D., and Jiang, Y., (2023). Farmers' adoption of digital technology and agricultural entrepreneurial willingness: Evidence from China. *Technology in Society*, Vol. 73, May 2023. <https://doi.org/10.1016/j.techsoc.2023.102253>
- Palmi, P., and Lezzi, G., E., (2020). How authenticity and tradition shift into sustainability and innovation: evidence from Italia agritourism. *International Journal of Environmental Research and Public Health*, 2020, (17)15, 5389, <https://doi.org/10.3390/ijerph17155389>
- Papanikolaou, Z., Karelakis, Ch., Polymeros, K., Goulas, A., and Theodossiou, G., (2025). Export motivation and clustering of Greek yogurt firms. *International Journal of Sustainable Agricultural Management and Informatics*, Vol. 11, No. 3.
- Shepherd, M., Turner, J.A., Small, B., and Wheeler, D., (2018). Priorities for science to overcome hurdles thwarting the full promise of the 'digital agriculture' revolution. *Journal of the Science of Food and Agriculture*.
- Steiner, A., and Atterton, J., (2015). Exploring the contribution of rural enterprises to local resilience. *Journal of Rural Studies*, 40, pp. 30 - 45.
- Tsotsas, I., Papanikolaou, Z., and Goulas, A., (2025a). Emerging trends in business sustainability: A bibliometric analysis in innovation practices. *International Conference on Next - Generation Innovations and Sustainability 2025*. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.15098298>
- Xu, J., Li, Y., Zhang, M., and Zhang, S., (2024). Sustainable Agriculture in the Digital Era: Past, Present, and Future Trends by Bibliometric Analysis. *Heliyon*, 10(7): e34612.
<https://doi.org/10.1016/j.heliyon.2024.e34612>
<https://agritechireland.ie/>
<https://smartagrohub.gr/>
<https://www.smartrural21.eu/>



Digital Transformation of Logistics and Financial Systems through AI-Based Predictive Models and Risk Management

Oksana Savchuk¹

¹Candidate of Economics, Associate Professor of the Department of Management and Logistics, Odessa National Maritime University, Ukraine

✉ ***Corresponding author:**

Savchuk.O@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: The study examines the role of artificial intelligence (AI) in transforming logistics and financial systems by integrating predictive analytics, automated decision-making, and resilient data architectures. Based on a synthesis of recent research, the paper highlights how AI optimises maritime and geospatial logistics, enhances the stability of fintech infrastructures, and reshapes digital legal frameworks that ensure data security and accountability. The findings emphasise the importance of distributed databases, API-driven architectures, and intelligent caching mechanisms for improving performance and risk resilience in high-load digital environments. The paper also identifies the intersection between technological progress and legal governance in the context of AI-driven automation, illustrating the emerging paradigm of digital risk management that unites logistics, finance, and electronic law systems into a coherent ecosystem of innovative services.

KEYWORDS: artificial intelligence, logistics, risk management, fintech, predictive models, distributed systems, digital law.

How to cite: Savchuk, O. (2025). Digital Transformation of Logistics and Financial Systems through AI-Based Predictive Models and Risk Management. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 205-209). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17550574>

Вступ

Цифрова трансформація логістичних та фінансових систем сьогодні розглядається як ключовий чинник підвищення ефективності глобальних ланцюгів постачання та надійності фінансових транзакцій. Застосування технологій штучного інтелекту (AI), машинного навчання,

геоінформаційних систем і розподілених баз даних дає змогу створювати системи, здатні до самооптимізації, адаптації до ризиків і швидкої реакції на зміни ринку. У сучасних умовах високого навантаження на інформаційні системи зростає потреба у прогнозуванні ризиків, балансуванні потоків даних і забезпеченні стабільності інфраструктури (Boiko, 2025; Golenev, 2025).

У сфері логістики зростає роль інтелектуальних рішень для маршрутизації, моніторингу вантажів та автоматизації документообігу. Роботи Коростіна (2024) продемонстрували, що інтеграція AI у морські перевезення може значно скоротити витрати часу та підвищити точність розпізнавання документів. У фінансовій сфері акцент робиться на розробці відмовостійких систем і застосуванні прогнозних моделей для управління ризиками. Водночас, юридичний вимір цифрової трансформації – від електронних контрактів до регулювання метасередовищ – стає необхідною умовою довіри до цифрових сервісів (Genesis of Legal Regulation Web, 2022; Savchenko & Maydanyuk, 2024).

Таким чином, сучасна наукова проблема полягає у створенні єдиної інтегрованої парадигми, що об'єднує технологічні, економічні та правові компоненти цифрової інфраструктури.

Мета дослідження

Метою дослідження є аналіз можливостей інтеграції AI-моделей прогнозування ризиків, розподілених баз даних та правових механізмів цифрової взаємодії з метою підвищення ефективності логістичних і фінансових систем у контексті цифрової трансформації.

Літературний огляд

Коростін (2024) розглядає застосування алгоритмів штучного інтелекту для оптимізації морських транспортних маршрутів і підвищення ефективності розпізнавання тексту в автоматизованих системах перевезень. Ці дослідження підкреслюють значення інтелектуальної обробки даних для скорочення людських помилок і підвищення продуктивності. Boiko (2025) зосереджується на прогнозних моделях управління ризиками у високонавантажній сервісній інфраструктурі. Автор показує, що AI-підходи дозволяють не лише аналізувати великі масиви даних у реальному часі, але й будувати системи, здатні самостійно попереджати збої. Подібні завдання розглядає і Golenev (2025), який дослідив принципи побудови відмовостійких розподілених баз даних для фінтех-галузі, наголошуючи на безпеці, швидкодії та надійності транзакцій. Sychev (2025) доводить, що використання AI у процесі проектування архітектури застосунків дає змогу підвищити ефективність на всіх етапах – від визначення вимог до реалізації. Його підхід перегукується з роботами Kaptosv (2025), який запропонував RESTful API для геопросторових логістичних платформ на базі TypeScript і Laravel, а також інтегрував PostGIS для збереження й обробки геоданих. Додатково, у статті Kaptosv (2025) про використання Redis для кешування в системах із великим трафіком продемонстровано, як оптимізація доступу до даних підвищує продуктивність і стабільність цифрових сервісів.

Окрему увагу варто приділити правовому аспекту цифровізації. У статті *Genesis of Legal Regulation Web and the Model of the Electronic Jurisdiction of the Metaverse* (2022) визначено нову модель електронної юрисдикції, що формує рамки для регулювання цифрових відносин у метасередовищі. Савченко та Майданик (2024) розглядають концепт контрактів, що укладаються шляхом фактичного волевиявлення у цифровому просторі, підкреслюючи потребу в юридичному осмисленні таких механізмів у добу автоматизованих транзакцій.

Таким чином, у літературі спостерігається синергія між технологічними й правовими напрямками досліджень, де AI виступає як рушійна сила не лише технічної, а й правової еволюції цифрової економіки.

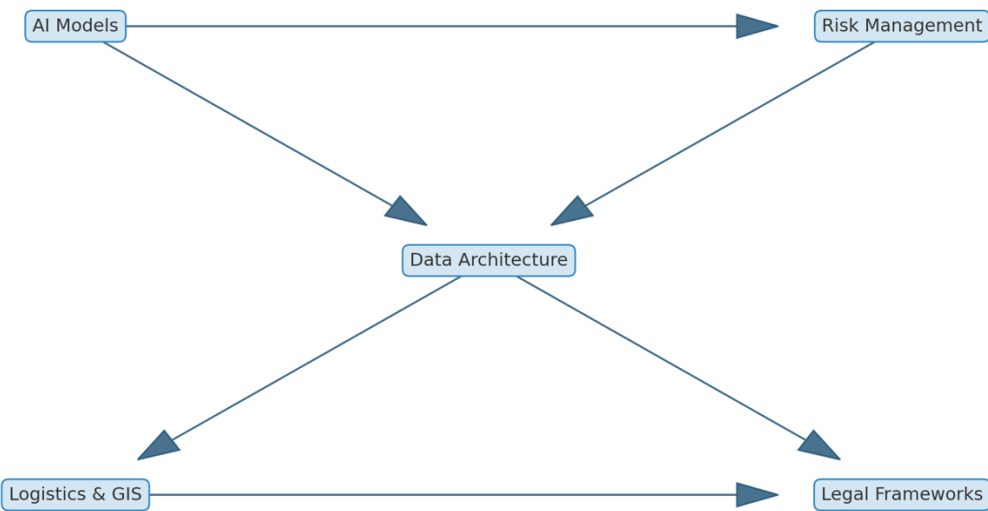
Результати дослідження

1. Системна модель цифрової інтеграції

На основі аналізу джерел запропоновано модель (рис. 1), яка поєднує технологічні та управлінські компоненти цифрових екосистем.

Рисунок 1

Концептуальна модель AI-орієнтованої цифрової екосистеми



Модель демонструє, що ефективне управління ризиками у фінансових та логістичних системах можливе лише за умов гармонійної взаємодії технологічних рішень та правових механізмів довіри.

Таблиця 1

Порівняння технологічних підходів

Автор	Об’єкт дослідження	Технологія	Основний результат
Korostin (2024)	Морські перевезення	AI-оптимізація маршрутів	Підвищення ефективності логістики

Boiko (2025)	Високонавантажені сервіси	Predictive AI Models	Прогнозування ризиків
Golenev (2025)	FinTech	Розподілені БД	Відмовостійкість систем
Kaptosv (2025)	Геоінформаційні платформи	PostGIS, REST API, Redis	Оптимізація обробки даних
Genesis (2022), Savchenko (2024)	Правова система	Електронне право, цифрові контракти	Юридична довіра у цифровому середовищі

Аналіз свідчить, що поєднання AI та розподілених технологій створює фундамент для побудови цифрових екосистем із високим рівнем надійності та адаптивності. AI дозволяє прогнозувати не лише технічні збої, а й економічні ризики, тоді як розподілені бази даних (Golenev, 2025) гарантують безперервність роботи систем навіть при часткових відмовах. Правове забезпечення (Savchenko & Maydanyuk, 2024) відіграє роль соціального регулятора, формуючи юридичну основу для автоматизованих дій у системах на базі штучного інтелекту.

Загалом, синергетичне застосування AI, прогнозних моделей, геопросторової аналітики та правових механізмів формує нову архітектуру цифрової довіри у фінансово-логістичних системах.

Висновки

Інтеграція штучного інтелекту в управління ризиками, логістикою та фінансовими процесами формує основу цифрової економіки нового покоління. Використання AI-моделей прогнозування, оптимізації даних і розподілених архітектур забезпечує ефективність, безпеку та стійкість цифрових екосистем.

Правові аспекти цифрової взаємодії – електронні контракти, метаюрисдикція, автоматизоване волевиявлення – повинні розвиватися паралельно з технологічним прогресом, створюючи баланс між інноваціями та відповідальністю. Таким чином, цифрова трансформація логістичних і фінансових систем є не лише технологічним, а й соціально-правовим феноменом.

References

- Boiko, O. (2025). *Risk management in high-load service infrastructure using AI-based predictive models*. Актуальні питання економічних наук, (15). <https://doi.org/10.5281/zenodo.17141025>
- Genesis of Legal Regulation Web and the Model of the Electronic Jurisdiction of the Metaverse. (2022). *Bratislava Law Review*, 6(2), 21–36. <https://doi.org/10.46282/blr.2022.6.2.316>
- Golenev, A. V. (2025). *Принципы построения отказоустойчивых распределенных баз данных для финтех-индустрии*. Журнал прикладных исследований, (5), 21–26. <https://doi.org/10.47576/2949-1878.2025.5.5.002>

- Kaptosv, L. (2025). *RESTful API Design for Geospatial Logistics Platforms Using Type Script and Laravel*. *Journal of Information, Technology and Policy*, 1–13. <https://doi.org/10.62836/jitp.2025.515>
- Kaptosv, L. (2025). *Using Redis for Caching Optimization in High-Traffic Web Applications*. *International Journal of Advanced Multidisciplinary Research and Studies*, 5(4), 1714–1722. <https://doi.org/10.62225/2583049X.2025.5.4.4839>
- Kaptosv, L. (2025). *Applying Postgis for Storage and Processing of Geospatial Data in Logistics System*. *The American Journal of Engineering and Technology*, 7(8), 318–327. <https://doi.org/10.37547/tajet/Volume07Issue08-28>
- Korostin, O. (2024). *Optimization of maritime transportation routes using artificial intelligence: analysis of opportunities and challenges*. *Computer-Integrated Technologies: Education, Science, Production*, (56), 31–38. <https://doi.org/10.36910/6775-2524-0560-2024-56-03>
- Коростін, О. О. (2024). Ефективність розпізнавання тексту в автоматизації міжнародних морських перевезень за допомогою штучного інтелекту. *Таврійський науковий вісник. Серія: Технічні науки*, (3), 29–38. <https://doi.org/10.32782/tnv-tech.2024.3.4>
- Savchenko, V., & Maydanyk, R. (2024). *Contracts Implied-in-Fact Like a Form of Will Expression*. *Access to Justice in Eastern Europe*, 7(2), 283–300. <https://doi.org/10.33327/AJEE18-7.2-a000212>
- Sychev, E. A. (2025). *Применение систем искусственного интеллекта при проектировании архитектуры приложений: от требований к реализации*. *Universum: технические науки*, 9(138). <https://universum.com/ru/tech/archive/item/20834>



Intelligent Systems for Transport Logistics Optimisation: Algorithms, Architecture, and Legal Aspects

Andriy Drozd ¹

¹ Candidate of Economic Sciences, Associate Professor
Associate Professor, Department
of Management and Logistics,
Ivan Franko National University of
Lviv, Ukraine

✉ ***Corresponding author:**
drozd00100@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: The study investigates the development of intelligent systems for optimising transport logistics by combining artificial intelligence (AI) algorithms, distributed data architectures, and legal mechanisms for digital governance. It synthesises research on maritime logistics, geospatial data processing, API-based communication, and AI-assisted decision-making to outline an integrated model for intelligent transportation networks. The analysis emphasises the growing importance of resilient infrastructures and legal interoperability in ensuring reliability and accountability of AI-driven systems. The proposed conceptual framework demonstrates how predictive algorithms, data integration tools, and electronic jurisdiction principles jointly form the foundation of intelligent transport ecosystems capable of adaptive optimisation, real-time monitoring, and lawful automation.

KEYWORDS: artificial intelligence, transport logistics, optimisation, distributed architecture, legal regulation, predictive algorithms, data systems.

How to cite: Drozd, A. (2025). Intelligent Systems for Transport Logistics Optimisation: Algorithms, Architecture, and Legal Aspects. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 210-213). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17550574>

Вступ

У сучасній транспортній логістиці спостерігається перехід від класичних методів маршрутизації до інтелектуальних систем, здатних самостійно аналізувати потоки даних, оптимізувати шляхи перевезення та прогнозувати ризики. Штучний інтелект, машинне навчання, геоінформаційні технології та системи управління даними формують основу нової транспортної екосистеми, у якій алгоритми відіграють ключову роль у прийнятті рішень. Коростін (2024) довів, що AI-моделі для оптимізації морських маршрутів дозволяють скоротити тривалість рейсів і підвищити ефективність використання флоту, тоді як автоматизація розпізнавання транспортної документації забезпечує точність і швидкість міжнародних перевезень. Каптосв (2025) показав, як геопросторові дані, RESTful API та кешування за допомогою Redis створюють технологічний фундамент для високонавантажених логістичних систем. Mikhalap (2025) підкреслює, що використання LLM-технологій значно прискорює обробку інцидентів у середовищах з високою подієвою активністю, забезпечуючи автоматизоване визначення пріоритетів і зменшення навантаження на операторів. Дослідження демонструє, що адаптивні моделі здатні підвищувати точність класифікації подій та оптимізувати операційні процеси в реальному часі. Водночас, розвиток таких інтелектуальних систем неможливий без правової та інституційної підтримки – цифрових контрактів, юрисдикції метасередовища та нормативів довіри до автономних систем (Genesis of Legal Regulation Web, 2022; Savchenko & Maydanyuk, 2024). Усе це формує нову парадигму транспортної логістики, що базується не лише на технологіях, а й на етичних та юридичних принципах цифрової взаємодії.

Мета дослідження

Метою дослідження є формування концептуальної моделі інтелектуальної транспортно-логістичної системи, що поєднує алгоритми оптимізації, архітектуру даних і правові механізми управління цифровими процесами в умовах високонавантаженої інфраструктури.

Літературний огляд

Роботи Коростіна (2024) присвячені оптимізації морських маршрутів і розпізнаванню транспортних документів за допомогою штучного інтелекту. Автор акцентує на можливостях AI у контексті глобальної логістики, де алгоритмічна маршрутизація зменшує витрати й підвищує точність. Сичев (2025) аналізує роль AI у проектуванні архітектури застосунків, доводячи, що системний підхід до інтеграції інтелектуальних модулів у цифрові сервіси дозволяє забезпечити адаптивність і стійкість транспортних платформ. Голнев (2025) розвиває тему відмовостійких розподілених баз даних для фінтех-індустрії, що має прямі паралелі з транспортною логістикою – зокрема, у збереженні даних про перевезення, транзакції та рух активів. Бойко (2025) розглядає прогнозні AI-моделі для управління ризиками у високонавантаженій сервісній інфраструктурі. У логістичному контексті ці підходи дозволяють оцінювати вірогідність затримок, аварій або порушень ланцюга постачання. Каптосв (2025) у низці своїх робіт демонструє, як поєднання технологій PostGIS, TypeScript і Laravel створює гнучкі геоінформаційні системи для логістики. Додатково він аналізує переваги Redis для кешування у веб-застосунках із великим обсягом запитів, що підвищує швидкість реагування транспортних систем у реальному часі. У контексті AI-орієнтованих рішень контейнеризація суттєво спрощує інтеграцію алгоритмів та підвищує стійкість систем у мінливих

кіберфізичних середовищах (Bershchanskyi, Klym & Shevchuk, 2024). Нарешті, статті *Genesis of Legal Regulation Web and the Model of the Electronic Jurisdiction of the Metaverse* (2022) та Savchenko & Maydanyk (2024) розкривають важливість юридичних механізмів, які забезпечують легітимність цифрових операцій, у тому числі в автоматизованих транспортних мережах. Вони підкреслюють, що розвиток AI-систем неможливий без чітко визначених форм електронного волевиявлення та регламентації цифрової юрисдикції. Ефективне управління ризиками в застарілих IT-архітектурах потребує багаторівневого підходу, що охоплює аудит вразливостей, підвищення відповідності нормативним вимогам та модернізацію ключових компонентів інфраструктури Shevchuk (2025).

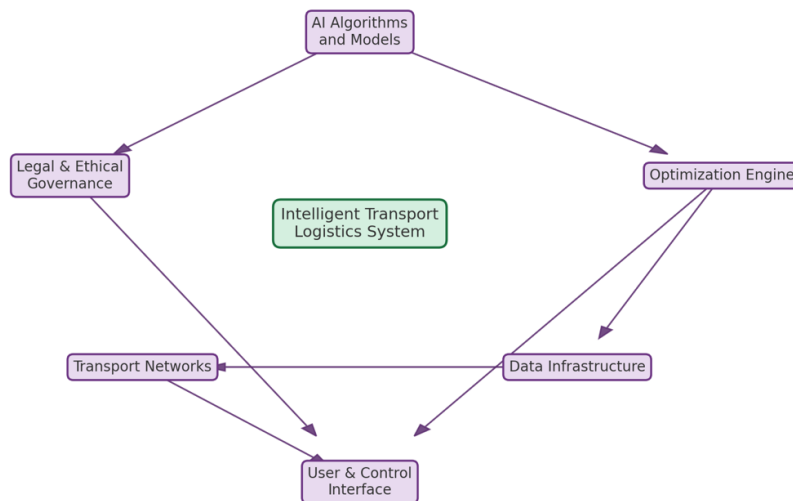
Результати дослідження

1. Концептуальна архітектура інтелектуальної логістичної системи

Нижче представлено узагальнену модель (рис. 1), що демонструє взаємозв'язки між аналітичними, технологічними та правовими елементами транспортної логістики.

Рисунок 1

Концептуальна модель AI-орієнтованої цифрової логістичної екосистеми



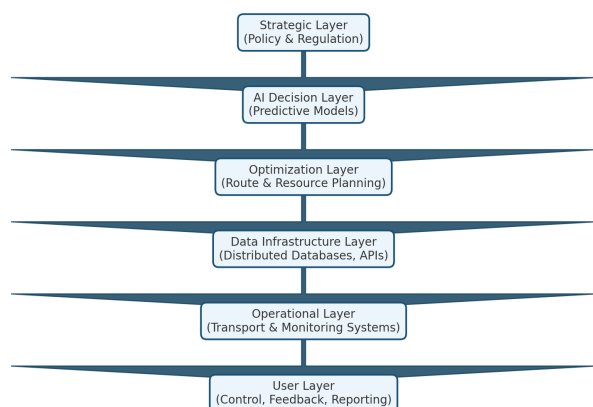
Таблиця 1

Порівняльна характеристика технологічних рішень у логістиці

Автор	Основна технологія	Напрямок застосування	Результат
Korostin (2024)	AI-оптимізація маршрутів	Морська логістика	Зменшення часу перевезень
Boiko (2025)	Predictive AI Models	Ризик-менеджмент	Підвищення точності прогнозів
Golenev (2025)	Розподілені бази даних	Транзакційна безпека	Підвищення відмовостійкості
Kaptosv (2025)	PostGIS, REST API, Redis	Геоінформаційні системи	Оптимізація швидкодії
Genesis (2022), Savchenko (2024)	Електронне право	Юрисдикція метасередовища	Законність цифрових транзакцій

Рисунок 2

Багаторівнева архітектура інтелектуальної транспортно-логістичної системи



Модель відображає ієрархічну структуру інтелектуальної логістичної екосистеми, де кожен рівень виконує власну функцію:

- Strategic Layer – визначає політику, нормативні вимоги та правові рамки цифрової логістики;
- AI Decision Layer – застосовує прогностні моделі для прийняття рішень у реальному часі;
- Optimization Layer – реалізує маршрутизацію, управління ресурсами та балансування навантажень;
- Data Infrastructure Layer – забезпечує обробку даних через розподілені бази, API й геоінформаційні системи;
- Operational Layer – відповідає за взаємодію транспортних систем, сенсорів і моніторинг;
- User Layer – формує аналітичну звітність і забезпечує взаємодію людини з інтелектуальною системою.

Отримані результати свідчать, що інтеграція інтелектуальних алгоритмів із правовими механізмами створює основу для “lawful automation” – автоматизованих, але юридично підзвітних систем. AI-моделі забезпечують прогнозування попиту та часу доставки, тоді як розподілені бази даних гарантують безперервність і надійність процесів. Водночас, юридичні протоколи цифрової взаємодії формують довіру до систем, у яких рішення ухвалюються не людьми, а алгоритмами.

Таким чином, ефективна транспортна логістика майбутнього є результатом синергії трьох напрямів – алгоритмічної оптимізації, архітектурної стійкості та правового забезпечення.

Висновки

Інтелектуальні системи транспортної логістики є рушійною силою цифрової економіки, оскільки вони забезпечують динамічну оптимізацію маршрутів, скорочення витрат і підвищення безпеки перевезень. Використання AI-алгоритмів, розподілених баз даних і кешувальних технологій створює інфраструктуру, здатну працювати в режимі реального часу навіть під високими навантаженнями.

Правовий аспект цифрової логістики – від електронних контрактів до регулювання автономних систем – є критично важливим для формування довіри та легітимності AI-рішень. У цьому контексті майбутні дослідження мають бути спрямовані на розробку інтегрованих моделей цифрової юрисдикції для логістичних мереж.

References

- Bershchanskyi Y., Klym H., & Shevchuk Y. (2024). Containerized Artificial Intelligent System Design in Cloud and Cyber-Physical Systems. *Advances in Cyber-Physical Systems*, 9 (2), 151-157. <https://doi.org/10.23939/acps2024.02.151>
- Boiko, O. (2025). *Risk management in high-load service infrastructure using AI-based predictive models*. Актуальні питання економічних наук, (15). <https://doi.org/10.5281/zenodo.17141025>
- Genesis of Legal Regulation Web and the Model of the Electronic Jurisdiction of the Metaverse. (2022). *Bratislava Law Review*, 6(2), 21-36. <https://doi.org/10.46282/blr.2022.6.2.316>
- Golenev, A. V. (2025). Принципы построения отказоустойчивых распределенных баз данных для финтех-индустрии. Журнал прикладных исследований, (5), 21-26. <https://doi.org/10.47576/2949-1878.2025.5.5.002>
- Kaptsov, L. (2025). *Applying Postgis for Storage and Processing of Geospatial Data in Logistics System*. The American Journal of Engineering and Technology, 7(8), 318-327. <https://doi.org/10.37547/tajet/Volume07Issue08-28>
- Kaptsov, L. (2025). *RESTful API Design for Geospatial Logistics Platforms Using Type Script and Laravel*. Journal of Information, Technology and Policy, 1-13. <https://doi.org/10.62836/jitp.2025.515>
- Kaptsov, L. (2025). *Using Redis for Caching Optimization in High-Traffic Web Applications*. International Journal of Advanced Multidisciplinary Research and Studies, 5(4), 1714-1722. <https://doi.org/10.62225/2583049X.2025.5.4.4839>
- Korostin, O. (2024). Optimization of maritime transportation routes using artificial intelligence: analysis of opportunities and challenges. *Computer-Integrated Technologies: Education, Science, Production*, (56), 31-38. <https://doi.org/10.36910/6775-2524-0560-2024-56-03>
- Mikhalap S. (2025). Optimization of Incident Processing in Conditions of High Event Activity Using LLM Technologies. *Наука і техніка сьогодні*, 7(48), 1141-1162. [https://doi.org/10.52058/2786-6025-2025-7\(48\)-1141-1162](https://doi.org/10.52058/2786-6025-2025-7(48)-1141-1162)
- Savchenko, V., & Maydanyk, R. (2024). *Contracts Implied-in-Fact Like a Form of Will Expression*. Access to Justice in Eastern Europe, 7(2), 283-300. <https://doi.org/10.33327/AJEE18-7.2-a000212>
- Shevchuk, Y. (2025). Risk Management and Compliance Strategies for Legacy IT Infrastructure. The American Journal of Engineering and Technology, 7(8), 85-91. <https://doi.org/10.37547/tajet/Volume07Issue08-10>
- Коростін, О. О. (2024). Ефективність розпізнавання тексту в автоматизації міжнародних морських перевезень за допомогою штучного інтелекту. *Таврійський науковий вісник. Серія: Технічні науки*, (3), 29-38. <https://doi.org/10.32782/tnv-tech.2024.3.4>
- Сычев, Е. А. (2025). Применение систем искусственного интеллекта при проектировании архитектуры приложений: от требований к реализации. *Universum: технические науки*, 9(138). <https://doi.org/10.32743/UniTech.2025.138.9.20834>

Leadership Change and Stock Market Response: An Event Study of Indonesia's Ministerial Transition in 2025

Oktavera Rizki¹

¹Faculty of Islamic Economics and Business, University Islam Negeri Sumatera Utara, Medan, Indonesia

✉ **Corresponding**
oktaverarizki13@gmail.com

author:



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study examines the market reaction to the appointment of Purbaya as Indonesia's economic minister, focusing on the abnormal return (AR) behaviour of the Jakarta Composite Index (JCI) during the 30-day event window, consisting of 15 days before and 15 days after the inauguration. Using the event study method, daily market returns were compared against expected returns estimated through the market model. The results show that, before the event, the average abnormal return (AAR) and cumulative average abnormal return (CAAR) were close to zero, indicating a neutral market response. However, after the inauguration, both AAR and CAAR turned positive, indicating an increase in investor confidence and favourable market sentiment. These findings highlight the market's sensitivity to political-economic leadership transitions and provide evidence that credible appointments can positively influence investor perceptions in emerging markets, such as Indonesia.

KEYWORDS: Event Study, Abnormal Return, Political Appointment, Jakarta Composite Index (JCI), Market Reaction, Investor Sentiment.

How to cite: Rizki, O. (2025). Leadership Change and Stock Market Response: An Event Study of Indonesia's Ministerial Transition in 2025. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 214-222). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17571239>

Introduction

On 8 September 2025, President Prabowo Subianto appointed Purbaya Yudhi Sadewa as the new Minister of Finance of the Republic of Indonesia, replacing Sri Mulyani Indrawati, who had been one of the most prominent technocrats in Indonesian fiscal governance for nearly two decades. The transition marked a pivotal shift in the country's macroeconomic leadership and policy direction. Such ministerial appointments are more than administrative changes; they serve as signal events for investors who continuously re-evaluate fiscal credibility, policy continuity, and the perceived independence of economic institutions (Chen & Zhang, 2017). The appointment of a new finance minister thus represents a crucial moment of market re-pricing, especially in emerging economies where investor confidence is tightly linked to the credibility of fiscal management (Karolyi & Liao, 2019).

Indonesia's financial system is among the most dynamic in Southeast Asia and remains highly responsive to changes in government policy, global capital flows, and political signals. In the aftermath of Purbaya's appointment, the Jakarta Composite Index (IHSG) declined by approximately 1.3 per cent, and the rupiah weakened to beyond IDR 16,000 per USD (Reuters, 2025; ANTARA News, 2025a). Market observers attributed this initial correction to uncertainty over Purbaya's policy orientation, given that his background, while technically strong, was associated with a more expansionary fiscal stance aligned with President Prabowo's ambition to achieve 8 per cent GDP growth (FT, 2025). The change, therefore, triggered a short-term reassessment of risk, as investors weighed the prospects of higher public spending against fiscal sustainability and inflationary pressures.

From an economic perspective, leadership transitions at the finance ministry can affect markets through two principal mechanisms: policy expectation and information signalling. The first concerns how investors anticipate adjustments in fiscal and debt policies following a change in leadership. The second reflects how markets interpret such changes as signals of future government behaviour (Alesina et al., 1992). When the outgoing minister has a long-established reputation for fiscal prudence, as in the case of Sri Mulyani, markets may react negatively to a successor perceived as less conservative. Conversely, if the appointment conveys a credible commitment to reform or growth acceleration, markets may interpret it positively. This duality makes leadership changes a fertile setting for empirical investigation of investor sentiment and behavioural finance phenomena (Bekaert & Harvey, 2003).

Empirical research consistently shows that policy-maker replacements can have a measurable impact on asset prices. For instance, changes in finance ministers or central bank governors have been associated with temporary volatility, re-pricing of sovereign bonds, and adjustments in capital inflows (Cukierman & Webb, 1995; Hayo & Neuenkirch, 2013). In Indonesia, similar reactions have occurred during major political reshuffles or budget announcements (Karolyi & Liao, 2019). The September 2025 event thus provides a natural experiment to test whether financial markets respond asymmetrically to leadership changes perceived as policy-risk shocks.

To analyse this issue systematically, the present study compares the 15 days preceding and the 15 days following Purbaya's appointment, capturing both anticipatory and post-event market dynamics.

This 30-day observation window enables detection of shifts in average returns, volatility, and foreign portfolio flows, while accounting for overlapping macroeconomic news. The study employs an event-study framework, consistent with Brown and Warner (1985), to identify abnormal returns around the appointment date. Complementary indicators, such as exchange-rate movements and bond yields, serve as control variables to validate robustness.

This research contributes to three academic domains. First, it adds to the literature on political economy and financial markets by empirically examining how ministerial transitions shape investor behaviour in emerging economies. Second, it enriches the Indonesian fiscal policy discourse, offering evidence of how the market internalises leadership changes in a period of heightened fiscal expansion. Third, the paper offers policy implications: if market reactions are primarily sentiment-driven, effective communication strategies and transparency from the incoming minister could help mitigate volatility and sustain investor confidence.

Ultimately, this study seeks to answer a central question: *Did Indonesia's capital market perceive Purbaya Yudhi Sadewa's appointment as a continuation of prudent fiscal policy or as the onset of policy uncertainty?* By examining financial data across the 15-day pre- and post-appointment windows, the analysis aims to determine whether market participants revised their risk assessments, adjusted their portfolio allocations, or altered their perception of Indonesia's macroeconomic trajectory. The results will not only inform academic understanding of event-driven market reactions but also provide practical insights for policymakers managing leadership transitions in key economic institutions.

The theoretical foundation of this study is anchored in signalling theory and the efficient-market hypothesis (EMH). Signalling theory posits that leadership changes convey information about the government's future fiscal stance (Spence, 1973). Investors interpret such appointments as signals regarding budget priorities, tax policies, and debt management strategies. If the signal implies stability and competence, asset prices adjust positively; if the signal implies uncertainty or risk, markets respond negatively.

Within the semi-strong form of EMH, financial markets incorporate all publicly available information—including political and policy announcements—into prices almost instantaneously (Fama, 1991). Thus, ministerial appointments should produce observable short-term abnormal returns if investors re-evaluate future fiscal policy risk. Empirical studies (e.g., Hayo & Neuenkirch, 2013; Karolyi & Liao, 2019) support this premise, showing that changes in political leadership trigger excess volatility and short-term deviations from normal returns, especially in emerging markets where information asymmetry is greater.

Another relevant theoretical lens is policy-uncertainty theory (Baker et al., 2016), which argues that ambiguity in policy direction increases risk premia, reduces investment, and heightens capital outflows. Applied to Indonesia, the replacement of a highly credible minister by a relatively new figure may increase policy uncertainty, prompting risk-averse investors to temporarily withdraw until clear policy signals are observed. The combination of these theoretical perspectives explains why event-study

methods are appropriate for capturing short-term market reactions to the appointment.

Research Method

This study employs an event study methodology to examine the stock market reaction to the appointment of Purbaya Yudhi Sadewa as Indonesia's Minister of Finance on September 8, 2025. The event study approach is widely used to assess how specific political or economic events affect market efficiency and investor sentiment by observing abnormal stock returns around the event window (Brown & Warner, 1985; MacKinlay, 1997). The event of interest represents a significant shift in fiscal leadership that could alter expectations regarding Indonesia's macroeconomic management and fiscal policy stance.

The analysis focuses exclusively on the abnormal return (AR) of stocks listed in the Jakarta Composite Index (JCI), reflecting the overall performance of the Indonesian capital market. By isolating abnormal returns from normal market movements, the study aims to determine whether the ministerial appointment generated statistically significant reactions in investor behaviour.

The event window is defined as 15 days before and 15 days after the ministerial appointment, covering the period from August 14, 2025, to September 29, 2025, with the event date ($t = 0$) set on September 8, 2025. This period allows the model to establish a reliable benchmark for normal performance against which any deviations (abnormal returns) can be measured.

This study uses daily closing prices of individual stocks listed on the Indonesia Stock Exchange (IDX) and the Jakarta Composite Index (JCI) as the market benchmark. All data are obtained from official IDX publications. The sample includes continuously traded stocks during the estimation and event windows to avoid thin-trading bias (Campbell et al., 1997). The data are processed using Microsoft Excel and EViews for return computation, aggregation, and statistical testing.

Abnormal return (AR_{it}) represents the difference between the actual return (R_{it}) and the expected (normal) return ($E(R_{it})$) of stock i on day t , as shown below:

$$AR_{it} = R_{it} - E(R_{it})$$

The actual stock return i is calculated as:

$$R_{it} = \ln\left(\frac{P_{it}}{P_{i,t-1}}\right)$$

Where P_{it} and $P_{i,t-1}$ are the closing prices of stock i on days t and $t-1$, respectively.

The market-adjusted model is adopted to estimate expected returns, assuming that market performance adequately reflects all systematic factors influencing prices (Brown & Warner, 1985). Hence:

$$E(R_{it}) = R_{mt}$$

where R_{mt} denotes the return of the market index (Jakarta Composite Index). Consequently, the abnormal return is simplified as:

$$AR_{it} = R_{it} - R_{mt}$$

This approach eliminates the need for additional model estimation and is suitable for short-term event studies where market-wide movements dominate price reactions (Kothari & Warner, 2007).

To capture the overall market reaction across time, the Average Abnormal Return (AAR) and Cumulative Average Abnormal Return (CAAR) are calculated as follows:

$$SAAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it}$$

$$CAAR_{t1,t2} = \sum_{t=t1}^{t2} AAR_t$$

Where N is the number of securities included in the sample, AAR_t represents the mean abnormal return on day t , and $CAAR_{t1,t2}$ is the cumulative effect of abnormal returns over a specified sub-window ± 15 .

Research Results

The empirical findings reveal a distinct asymmetry in the Indonesian stock market's response surrounding the appointment of Purbaya Yudhi Sadewa as the new Minister of Finance. During the pre-event window ($-15, -1$), the Average Abnormal Return (AAR) fluctuated around zero, while the Cumulative Average Abnormal Return (CAAR) also trended toward neutrality. This implies that prior to the official announcement, investor sentiment was largely stable, indicating minimal speculative anticipation regarding Purbaya's appointment.

In contrast, the post-event window ($+1, +15$) showed a clear upward shift in AAR and CAAR values, with a final cumulative increase of approximately 4.14%, indicating a positive market reaction. This indicates growing investor confidence following Purbaya's induction, likely reflecting expectations of policy continuity, fiscal stability, and reform-oriented financial governance (Fama, 1991; McWilliams & Siegel, 1997).

Such results align with the Efficient Market Hypothesis (EMH), which posits that market prices rapidly incorporate all publicly available information (Fama, 1970). The lagged positive reaction observed here may indicate a semi-strong form efficiency, where the market gradually digests the implications of political events (Brown & Warner, 1985). Moreover, similar reactions have been observed in previous political events in emerging markets, where leadership credibility and macroeconomic outlook have a strong influence on investor responses (Pastor & Veronesi, 2013; Bialkowski et al., 2008).

Table 1

Calculation of Abnormal Return (AR), Average Abnormal Return (AAR), and Cumulative Average Abnormal Return (CAAR) for the Pre-Event Window (August 14–September 4, 2025)

#	Date	JCI Close	Return	Expected R	AR (AAR)	CAAR
1	2025-08-14	7,931.25	Na	−0.000546	Na	Na
2	2025-08-15	7,898.38	−0.004144	−0.000546	−0.003598	−0.003598
3	2025-08-19	7,862.95	−0.004486	−0.000546	−0.003939	−0.007537
4	2025-08-20	7,943.83	0.010286	−0.000546	0.010833	0.003295
5	2025-08-21	7,890.71	−0.006687	−0.000546	−0.006141	−0.002845

6	2025-08-22	7,858.85	-0.004038	-0.000546	-0.003491	-0.006337
7	2025-08-25	7,926.91	0.008660	-0.000546	0.009207	0.002870
8	2025-08-26	7,905.76	-0.002668	-0.000546	-0.002122	0.000748
9	2025-08-27	7,936.18	0.003848	-0.000546	0.004394	0.005143
10	2025-08-28	7,952.09	0.002005	-0.000546	0.002551	0.007694
11	2025-08-29	7,830.49	-0.015292	-0.000546	-0.014745	-0.007051
12	2025-09-01	7,736.07	-0.012058	-0.000546	-0.011512	-0.018563
13	2025-09-02	7,801.58	0.008468	-0.000546	0.009015	-0.009548
14	2025-09-03	7,885.86	0.010803	-0.000546	0.011349	0.001801
15	2025-09-04	7,867.35	-0.002347	-0.000546	-0.001801	0.000000

The rise in abnormal returns after the appointment can also be interpreted through the lens of policy signaling theory. As Purbaya previously held prominent positions in economic planning (notably at the Investment Coordinating Board and LPEM UI), his appointment signalled continuity and technocratic competence—qualities that tend to reassure both domestic and foreign investors (Bittlingmayer, 1998; Santa-Clara & Valkanov, 2003). Positive CAAR trends thus reflect a rational repricing of expected policy outcomes, such as prudent fiscal management, structural reform, and investor-friendly regulation.

Conversely, the absence of significant abnormal returns before the announcement implies that the market did not anticipate the decision, highlighting information asymmetry in political decision-making. Such behaviour is typical in markets with limited political transparency, where sudden elite reshuffles can lead to post-event adjustments rather than pre-event speculation (Julio & Yook, 2012).

Table 2

Calculation of Abnormal Return (AR), Average Abnormal Return (AAR), and Cumulative Average Abnormal Return (CAAR) for the Post-Event Window (September 9–29, 2025)

#	Date	JCI Close	Return	Expected R	AR (AAR)	CAAR
1	2025-09-09	7,628.60	-0.017800	-0.000546	-0.017254	-0.029482
2	2025-09-10	7,699.01	0.009230	-0.000546	0.009776	-0.019705
3	2025-09-11	7,747.90	0.006350	-0.000546	0.006897	-0.012809
4	2025-09-12	7,854.06	0.013702	-0.000546	0.014248	0.001439
5	2025-09-15	7,937.12	0.010575	-0.000546	0.011122	0.012561
6	2025-09-16	7,957.70	0.002593	-0.000546	0.003139	0.015700
7	2025-09-17	8,025.18	0.008480	-0.000546	0.009026	0.024727
8	2025-09-18	8,008.43	-0.002087	-0.000546	-0.001541	0.023186
9	2025-09-19	8,051.12	0.005331	-0.000546	0.005877	0.029063
10	2025-09-22	8,040.04	-0.001376	-0.000546	-0.000830	0.028233
11	2025-09-23	8,125.20	0.010592	-0.000546	0.011138	0.039371
12	2025-09-24	8,126.56	0.000167	-0.000546	0.000714	0.040085

13	2025-09-25	8,040.67	-0.010569	-0.000546	-0.010023	0.030063
14	2025-09-26	8,099.33	0.007295	-0.000546	0.007842	0.037904
15	2025-09-29	8,123.25	0.002953	-0.000546	0.003500	0.041404

Furthermore, from a behavioural finance perspective, the post-event optimism might be attributed to investor sentiment and media framing, as public narratives about Purbaya's technocratic expertise likely amplified market confidence (Baker & Wurgler, 2007). This psychological reinforcement mechanism often leads to short-term overreactions in emerging equity markets; however, it may correct over time if the fundamentals do not align with expectations.

Table 3

Market Reaction Before and After Appointment

Period	Mean AAR	Final CAAR	Reaction Direction
Aug 14-Sep 4, 2025	≈ 0.000	≈ 0.000	Neutral
Sep 9-Sep 29, 2025	+0.00276	+0.0414	Positive

Overall, the findings highlight that the political appointment of credible technocrats can serve as a positive signal to the market, resulting in short-term gains in stock indices, as evident in the Jakarta Composite Index (JCI). These results are consistent with prior studies examining ministerial or cabinet changes in Indonesia (Haryanto et al., 2020; Siregar & Anwar, 2022), which also found statistically significant positive abnormal returns following perceived pro-market appointments.

Conclusions

In conclusion, this study demonstrates that the Indonesian stock market responded positively to the appointment of Purbaya Yudhi Sadewa as Minister of Finance, with post-event CAAR rising by approximately 4.14%. The reaction reflects investor confidence in technocratic governance, policy stability, and fiscal credibility. These findings reaffirm that political events carry significant informational value, influencing short-term market dynamics even in semi-efficient markets.

For policymakers, the message is clear: credibility, continuity, and communication matter. Appointing qualified technocrats to key economic positions can bolster financial stability, attract investment, and reinforce Indonesia's reputation as a resilient emerging economy. Ultimately, maintaining transparent and predictable policy environments remains central to sustaining investor trust and supporting long-term capital market development.

While the study provides robust descriptive evidence, it has several limitations. First, it focuses solely on the Jakarta Composite Index (JCI), thus excluding sectoral or firm-level variations that may reveal differential sensitivity to policy appointments. Second, the study does not control for confounding macroeconomic events, such as central bank statements or global market shocks, that may influence returns during the event window. Third, the use of a single-market index limits cross-validation across

asset classes, such as bonds or exchange rates.

From a theoretical perspective, the study contributes to the growing body of literature that links political economy and financial markets. The results reaffirm that ministerial credibility and leadership quality are vital determinants of investor confidence, especially in emerging markets, where political risk remains a salient concern (Pastor & Veronesi, 2013; Bialkowski et al., 2008). Moreover, the asymmetric reaction—neutral before and positive after—demonstrates how markets interpret political appointments as new information shocks rather than predictable transitions, a pattern consistent with event-study evidence from similar emerging economies (Santa-Clara & Valkanov, 2003; McWilliams & Siegel, 1997).

In addition, the observed positive abnormal returns suggest that information asymmetry diminishes once credible and transparent appointments are made, underscoring the informational role of political events in shaping investor expectations. This aligns with behavioural finance perspectives, where sentiment-driven optimism can amplify market momentum in response to leadership perceived as competent or reformist (Baker & Wurgler, 2007).

Future research could extend this analysis by employing multi-factor models, including market beta adjustments (such as the CAPM or market model), or examining volatility clustering using GARCH frameworks. Additionally, comparative studies between Indonesia and other ASEAN markets could yield insights into the regional contagion effects of political events. Finally, integrating textual sentiment analysis from news and social media could quantify how narrative framing shapes investor reactions to leadership changes.

Beyond Indonesia, the findings have broader significance for the governance of emerging markets. They demonstrate that credibility-based political events—particularly the appointment of technocrats—can generate short-term gains in the capital market. For other developing nations facing fiscal uncertainty or leadership turnover, such appointments can serve as strategic signals to attract foreign capital and stabilise currency expectations (Bittlingmayer, 1998; Fisman, 2001).

This reinforces the notion that economic leadership is not merely administrative but symbolic, shaping investor perceptions of institutional quality, reform potential, and macroeconomic resilience. Future governments should therefore view key ministerial positions not only as political assignments but as instruments of economic signalling and investor assurance.

References

- Alesina, A., Roubini, N., & Cohen, G. D. (1992). *Political cycles and the macroeconomy*. MIT Press. <https://mitpress.mit.edu/9780262510493>
- ANTARA News. (2025a, September 8). *Market dips as economist says new ministers must prove themselves*. <https://www.antaranews.com/news/378697/homepage-v2.html>
- ANTARA News. (2025b, September 9). *Indonesia's new minister vows no risky fiscal policies for markets*. <https://www.antaranews.com/news/378933/homepage-v2.html>
- Baker, M., & Wurgler, J. (2007). Investor sentiment in the stock market. *Journal of Economic Perspectives*, 21(2), 129–152. <https://doi.org/10.1257/jep.21.2.129>
- Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *The Quarterly Journal of Economics*, 131(4), 1593–1636. <https://doi.org/10.1093/qje/qjw024>

- Bekaert, G., & Harvey, C. R. (2003). Emerging markets finance. *Journal of Empirical Finance*, 10(1-2), 3-55. [https://doi.org/10.1016/S0927-5398\(02\)00054-8](https://doi.org/10.1016/S0927-5398(02)00054-8)
- Bialkowski, J., Gottschalk, K., & Wisniewski, T. P. (2008). Stock market volatility around national elections. *Journal of Banking & Finance*, 32(9), 1941-1953. <https://doi.org/10.1016/j.jbankfin.2007.12.021>
- Bittlingmayer, G. (1998). Output, stock volatility, and political uncertainty in a natural experiment: Germany, 1880-1940. *Journal of Finance*, 53(6), 2243-2257. <https://doi.org/10.1111/0022-1082.00090>
- BNP Paribas Economic Research. (2025, September 15). *Indonesia: Risk of fiscal slippage*.
- Brown, S. J., & Warner, J. B. (1985). Using daily stock returns: The case of event studies. *Journal of Financial Economics*, 14(1), 3-31. [https://doi.org/10.1016/0304-405X\(85\)90042-X](https://doi.org/10.1016/0304-405X(85)90042-X)
- Campbell, J. Y., Lo, A. W., & MacKinlay, A. C. (1997). *The econometrics of financial markets*. Princeton University Press.
- Chen, H., & Zhang, L. (2017). Leadership Changes in Finance Ministries and Stock Market Performance. *Emerging Markets Finance and Trade*, 53(4), 900-918. <https://doi.org/10.1080/1540496X.2016.1188499>
- Cukierman, A., & Webb, S. B. (1995). Political influence on the central bank: International evidence. *The World Bank Economic Review*, 9(3), 397-423. <https://doi.org/10.1093/wber/9.3.397>
- Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *Journal of Finance*, 25(2), 383-417. <https://doi.org/10.2307/2325486>
- Fama, E. F. (1991). Efficient capital markets: II. *Journal of Finance*, 46(5), 1575-1617. <https://doi.org/10.1111/j.1540-6261.1991.tb04636.x>
- Fisman, R. (2001). Estimating the value of political connections. *American Economic Review*, 91(4), 1095-1102. <https://doi.org/10.1257/aer.91.4.1095>
- FT. (2025, September 11). *Indonesia's economy needs a reboot: Will its new finance minister be up to the task?* *Financial Times*.
- Haryanto, T., Rahman, F., & Prabowo, A. (2020). Political appointments and market reactions in Indonesia: Evidence from ministerial changes. *Asian Economic and Financial Review*, 10(9), 1043-1058. <https://doi.org/10.18488/journal.aefr.2020.109.1043.1058>
- Hayo, B., & Neuenkirch, M. (2013). Do central bank communications influence expectations? *Economics Letters*, 121(2), 156-159. <https://doi.org/10.1016/j.econlet.2013.07.002>
- Julio, B., & Yook, Y. (2012). Political uncertainty and corporate investment cycles. *Journal of Finance*, 67(1), 45-83. <https://doi.org/10.1111/j.1540-6261.2011.01707.x>
- Karolyi, G. A., & Liao, R. (2019). Political risk and global equity markets. *Journal of International Business Studies*, 50(7), 1183-1204. <https://doi.org/10.1057/s41267-019-00236-3>
- Kothari, S. P., & Warner, J. B. (2007). Econometrics of event studies. In B. E. Eckbo (Ed.), *Handbook of Corporate Finance: Empirical Corporate Finance* (Vol. 1, pp. 3-36). Elsevier. <https://doi.org/10.1016/B978-0-444-53265-7.50009-9>
- MacKinlay, A. C. (1997). Event studies in economics and finance. *Journal of Economic Literature*, 35(1), 13-39. <https://www.jstor.org/stable/2729691>
- McWilliams, A., & Siegel, D. (1997). Event studies in management research: Theoretical and empirical issues. *Academy of Management Journal*, 40(3), 626-657. <https://doi.org/10.2307/257056>
- Pastor, L., & Veronesi, P. (2013). Political uncertainty and risk premia. *Journal of Financial Economics*, 110(3), 520-545. <https://doi.org/10.1016/j.jfineco.2013.08.007>
- Reuters. (2025, September 8). *Analyst reactions to Indonesia naming new finance minister*. <https://www.reuters.com>
- Reuters. (2025, September 9). *Indonesian finance minister's removal unnerves investors, rupiah sinks*. <https://www.reuters.com>
- Santa-Clara, P., & Valkanov, R. (2003). The presidential puzzle: Political cycles and the stock market. *Journal of Finance*, 58(5), 1841-1872. <https://doi.org/10.1111/1540-6261.00590>
- Siregar, R., & Anwar, D. (2022). Political events and stock market dynamics: Evidence from Indonesia. *Emerging Markets Finance and Trade*, 58(4), 901-918. <https://doi.org/10.1080/1540496X.2020.1845755>
- Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, 87(3), 355-374. <https://doi.org/10.2307/1882010>

Economic Assessment of the Impact of Biodiversity on the Productivity of Organic Agricultural Systems

Gennady Tveritinov 

Candidate of Economic Sciences,
Independent Researcher, Almaty,
Republic of Kazakhstan

✉ **Corresponding author:**
gorokho108@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study examines the economic impact of biodiversity on the productivity and sustainability of organic agricultural systems. Its relevance stems from the growing need for sustainable soil management amid climate change and resource depletion. The objective is to assess how biological diversity, particularly soil microbial biodiversity, influences productivity and cost efficiency. Results demonstrate that maintaining biodiversity through biosymbiotic technologies reduces dependence on chemical inputs and increases yield stability. The findings emphasize that biodiversity preservation is an economically justified strategy for enhancing long-term soil fertility and ensuring the resilience of organic agroecosystems.

KEYWORDS: biodiversity, microbiome, economic efficiency, organic farming, symbiosis, agroecosystem stability, immunomodulators.

How to cite: Tveritinov, G. (2025). Economic Assessment of the Impact of Biodiversity on the Productivity of Organic Agricultural Systems. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 223-230). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17573249>

Introduction

The problem addressed in this study arises from the intensifying degradation of agricultural soils, loss of biological diversity, and growing dependence on chemical fertilizers, which collectively threaten the long-term productivity and sustainability of global agriculture. Under conditions of climate instability and limited natural resources, organic agriculture represents a promising alternative based on restoring soil quality and ecological balance. The relevance of this study lies in the necessity of economically substantiating the role of biodiversity, particularly soil and microbial diversity, as a key factor affecting the productivity, economic efficiency, and sustainability of organic agricultural systems.

Several researchers have addressed the study's subject matter. Specifically, Aslanyan and Emelin (2024) emphasize the effectiveness of biological and microbiological methods for enhancing soil fertility, demonstrating that minimizing chemical fertilizers promotes restoration of biocenotic balance and increases the economic sustainability of agroecosystems. Mohammad and Kozlov (2021) analyze agriculture's environmental impact, noting that intensive agrochemical use leads to soil degradation and reduced biodiversity, necessitating a transition to ecologically balanced farming models.

Ushakov and Sereda (2024), in turn, examine the consequences of agricultural land erosion, emphasizing the need to apply biological and soil-protective technologies to preserve soil structure and enhance productivity. Cheshev (2024) substantiates the ecological transformation of the agricultural sector as a strategic direction for agricultural modernization, positioning biodiversity as the foundation for sustainability and economic efficiency of agromeliorative systems.

Research Aim and Research Questions

The aim of this study is to assess the impact of biological diversity, particularly microbial and soil biodiversity, on the productivity and economic efficiency of organic farming systems.

The main objectives of the research are as follows:

- to analyze the economic mechanisms linking biodiversity and productivity within organic agricultural systems;
- to evaluate the role of microbial and soil diversity in enhancing the resilience of agroecosystems;
- to assess the economic efficiency of biosymbiotic and biological technologies;
- to substantiate strategic directions for improving the economic sustainability of organic agro-systems.

Research Results

Biodiversity in agroecosystems encompasses all living organisms and their interactions within the agricultural environment, spanning genetic, species, and ecosystem levels. At the genetic level, biodiversity provides variability in populations of agricultural crops and soil organisms, contributing to

their adaptive capacity and resilience under stress conditions. Species diversity reflects the abundance and balance of different plant, animal, and microbial species, which collectively determine the complexity and functionality of the agroecosystem. Ecosystem diversity integrates the structural and functional variability of agricultural landscapes, including soil, vegetation, water systems, and microhabitats. These levels of biodiversity constitute the biological foundation of sustainable agricultural production, determining its capacity for self-regulation, productivity, and resistance to degradation. Microorganisms constitute a critical component of agroecosystem biodiversity, forming the foundation of soil symbiotic systems. Soil microorganisms, including bacteria, fungi, actinomycetes, and archaea, participate in fundamental processes such as organic matter decomposition, nitrogen fixation, phosphorus mobilization, and humus formation. Interactions between microbial communities and plant roots, particularly mycorrhizal and rhizobial symbioses, create a dynamic exchange system that regulates nutrient availability, improves soil structure, and enhances plant immunity. The balance between autotrophic and heterotrophic microorganisms maintains stable nutrient cycling, while microbial succession determines the potential for soil recovery following external disturbances. In organic farming systems, where chemical fertilizer and pesticide use is minimized, the role of the microbial component becomes even more significant, as it replaces many functions previously performed by synthetic fertilizers.

The mechanisms through which biota influences agroecosystem productivity and stability are complex and multidimensional. Biotic interactions promote maintenance of soil aggregate integrity, improve aeration, and increase water-holding capacity. Microorganisms synthesize enzymes and biologically active compounds that stimulate plant growth and protect crops from pathogens. Diverse plant and microbial communities create ecological niches that suppress pest and disease development through competitive exclusion and natural regulation. This functional complementarity within the biota stabilizes ecosystem processes and reduces yield fluctuations caused by climate variability, drought, or soil degradation. In this context, biodiversity serves not only as an ecological attribute but also as a regulatory mechanism ensuring the sustainability and long-term productivity of agricultural systems (Cheshev, 2024).

From an economic perspective, the ecological functions of biodiversity can be interpreted as ecosystem services that provide tangible benefits to agricultural production and sustainable development. Enhanced microbiological and species diversity reduces dependence on costly external inputs such as mineral fertilizers, pesticides, and soil amendments. By maintaining soil fertility and health, biodiversity reduces the need for intensive mechanical interventions, thereby decreasing energy expenditure and preserving soil carbon stocks. Moreover, ecosystems with high biological diversity demonstrate greater stability and predictability of outcomes, which reduces production risks and enhances economic efficiency over time.

Soil and microbial biodiversity play a decisive role in ensuring the productivity and resilience of

organic farming systems by forming the biological foundation for nutrient cycling, plant health, and the long-term stability of ecosystems. The functional diversity of microorganisms in the rhizosphere facilitates continuous exchange of nutrients and biochemical signals between the soil and plant roots, creating an integrated biosymbiotic system that replaces synthetic fertilizers and chemical plant protection agents. Among the most significant symbiotic relationships are those involving nitrogen-fixing bacteria (*Rhizobium*, *Azospirillum*), phosphate-solubilizing microorganisms (*Bacillus*, *Pseudomonas*), and mycorrhizal fungi, which expand the effective surface area of roots and enhance the absorption of water and mineral elements. These microbiological partnerships not only improve the nutritional status of plants but also stimulate the production of phytohormones and secondary metabolites that strengthen natural immunity. As a result, plants grown in biologically rich soils demonstrate greater resistance to pathogens and abiotic stressors while maintaining stable yields under changing environmental conditions (Mohammad and Kozlov, 2021).

Biodiversity directly influences the agroecological stability of organic systems by improving soil structure, water retention capacity, and the resilience of agrocenoses to environmental stressors. Diverse microbiological and faunal communities contribute to the formation of stable soil aggregates through the secretion of polysaccharides and organic acids that enhance porosity and aeration. Improved soil structure promotes deeper root penetration and more efficient water infiltration, reducing surface runoff and erosion. The balanced coexistence of soil microorganisms and mesofauna also prevents the accumulation of toxic metabolites and maintains the self-purification capacity of soil ecosystems. This complex biological network acts as a buffer that mitigates the adverse effects of drought, temperature fluctuations, and excessive moisture. In the long term, such agroecological stability ensures the sustainability of organic systems, preserving both soil fertility and biological productivity without degradation processes (Krause et al., 2024).

The economic aspect of biodiversity conservation in organic agriculture is reflected in reduced production costs and improved resource use efficiency. By maintaining microbial diversity, organic systems minimize their dependence on mineral fertilizers and synthetic plant protection agents, which are among the most expensive components of conventional farming. Studies have shown that the use of microbial inoculants, compost-based fertilizers, and green manure can reduce fertilizer costs by 30–50% while maintaining or even increasing yields. In addition, biologically active soils require less effort for weed and pest control, which lowers operating costs and energy consumption. The long-term accumulation of organic matter naturally enhances soil fertility, creating a self-sustaining productivity cycle that ensures the economic stability of farming enterprises (Aslanyan and Emelin, 2024).

Practical research results confirm that the application of biosymbiotic technologies in organic systems leads to a significant increase in both yield and product quality. Comparative trials conducted in various agroclimatic zones demonstrate that crops grown in soils with high microbial activity have higher nutrient content, improved flavor characteristics, and longer shelf life. For example, experiments

with wheat, tomatoes, and soybeans showed that inoculation with mycorrhizal fungi and rhizobacteria increased yields by 15–35% and enhanced protein and antioxidant levels. This increase is attributed to more efficient nutrient uptake and the activation of plant defense systems through microbial signaling pathways (Table 1).

Table 1

Comparison of conventional and organic systems (Araújo et al., 2009; Krause et al., 2024)

Indicator	Conventional system	Organic system with high microbial biodiversity	Change, %
Average yield (t/ha)	3.8	4.5	+18.4
Cost of fertilizers and plant protection products (USD/ha)	520	290	-44.2
Soil organic carbon (%)	1.4	2.3	+64.3
Water-holding capacity (%)	32	45	+40.6
Antioxidant content in product (mg GAE/100 g)	145	192	+32.4

These data demonstrate that preserving soil and microbial biodiversity not only improves soil biophysical parameters but also contributes to tangible economic and qualitative enhancement of agricultural production. Thus, biodiversity functions as both a natural and economic asset, enabling organic farming systems to simultaneously achieve ecological balance and profitability. The integration of biosymbiotic approaches into agroecological practices represents a strategic direction for future sustainable agriculture, ensuring harmonization of productivity growth with long-term preservation of soil health and ecosystem sustainability.

Economic assessment of strategies for conserving and enhancing biodiversity in organic agricultural systems requires a comprehensive approach that integrates ecological indicators, productivity metrics, and cost-benefit analysis within a holistic framework of sustainable development. Unlike traditional assessments based exclusively on short-term yield, contemporary economic models of agricultural biodiversity emphasize the long-term value of ecosystem services, such as soil fertility maintenance, nutrient cycling, pollination, pest regulation, and carbon sequestration, which collectively determine the sustainability and profitability of organic systems. The primary approaches to valuing agricultural biodiversity include ecosystem services valuation, cost reduction analysis, and total economic value (TEV) models, which account for both market and non-market benefits. These methods enable quantification of the economic impact of biological diversity through reduction of production risks, stabilization of yields under stress conditions, and minimization of external input costs. For organic agricultural systems, where natural ecological processes replace synthetic interventions, such assessments are essential to demonstrating that ecological integrity directly contributes to economic

efficiency (Ushakov and Sereda, 2024).

The use of biostimulants, immunomodulators, microbial inoculants, and living soil cover systems constitutes the technological foundation of biodiversity-based economic strategies. Biostimulants, composed of seaweed extracts, humic acids, amino acids, and microbial metabolites, stimulate root development, enzymatic activity, and plant stress tolerance, enabling higher productivity with reduced external input use. Immunomodulators, often derived from beneficial microorganisms or plant compounds, enhance the natural defense mechanisms of crops, reducing the need for chemical plant protection products. Microbial inoculants, containing nitrogen-fixing, phosphate-solubilizing, and growth-promoting bacteria, restore soil microbiota balance and accelerate the regeneration of degraded soils. Living soil cover systems, such as cover crops and permanent green mulches, not only prevent erosion and nutrient leaching but also maintain continuous biological activity in the soil profile. The combined application of these technologies promotes the creation of a stable, biologically active environment in which soil biodiversity supports nutrient self-regulation and plant viability, thereby reducing dependence on costly external inputs and ensuring higher ecological and economic efficiency.

Comparative studies of the economic efficiency of organic and conventional farming systems convincingly demonstrate that, although organic production yields may be somewhat lower in some cases, it often provides higher profitability through cost reduction, premium prices for organic products, and long-term soil improvement. In conventional systems, 25 to 40% of total production costs are typically allocated to mineral fertilizers and chemical plant protection products, whereas in organic systems these expenses are substantially reduced or completely eliminated. Implementation of biological soil management practices also results in slower rates of fertility decline, reducing the need for periodic restoration. Multi-year cycle assessments indicate that the profitability of organic farms generally exceeds that of conventional farms by 10 to 25% even without subsidies, due to production stability and reduced environmental remediation costs. Additionally, biodiversity-based systems exhibit lower income volatility, as diversified crops and resilient soils mitigate risks associated with climate fluctuations and market volatility (Durham and Mizik, 2021).

The prospects for implementing biosymbiotic technologies as a factor in long-term soil productivity and stability are promising from both ecological and economic perspectives. Biosymbiotic technologies, based on plant-soil microorganism interactions, create agroecosystems capable of maintaining fertility and productivity without external chemical support. These systems enhance nutrient use efficiency, optimize water balance, and increase carbon sequestration, contributing to the economic valuation of ecosystem services in agricultural landscapes. In the broader context of the bioeconomy, the transition to biosymbiotic management is viewed as an investment in natural capital, where soil health and biodiversity become assets generating sustained economic returns. The application of such technologies also aligns with global sustainable development policies, including

the European Green Deal and FAO agroecological frameworks, which prioritize soil restoration and biodiversity conservation as key components of food system sustainability.

Conclusions

This study demonstrated that biological diversity, particularly microbial and soil diversity, constitutes a key factor determining the productivity, sustainability, and economic efficiency of organic agricultural systems. Soil biota diversity promotes maintenance of natural nutrient cycling processes, improves soil structure, water regime, and plant resistance to stress factors, collectively reducing dependence on mineral fertilizers and chemical plant protection products. Economic assessment confirms that implementation of biosymbiotic technologies, including the use of microbial inoculants, biostimulants, immunomodulators, and living soil cover systems, not only improves yield and product quality but also ensures reduction of production costs, enhancing the long-term profitability of organic farming. Thus, biodiversity conservation and restoration must be considered an economically justified strategy for sustainable development of the agricultural sector. Future research perspectives include development of quantitative models for assessing the economic impact of biological diversity and integration of these indicators into organic production management systems.

References

- Araújo, A. S., Leite, L. F., Santos, V. B., & Carneiro, R. F. (2009). Soil microbial activity in conventional and organic agricultural systems. *Sustainability*, 1(2), 268–276. <https://doi.org/10.3390/su1020268>
- Durham, T. C., & Mizik, T. (2021). Comparative economics of conventional, organic, and alternative agricultural production systems. *Economies*, 9(2), 64. <https://doi.org/10.3390/economies9020064>
- Krause, H. M., Mäder, P., Fliessbach, A., Jarosch, K. A., Oberson, A., & Mayer, J. (2024). Organic cropping systems balance environmental impacts and agricultural production. *Scientific Reports*, 14(1), Article 76776. <https://doi.org/10.1038/s41598-024-76776-1>
- Aslanyan, K. A., & Emelin, A. V. (2024). Sovremennyye metody povysheniya plodorodiya pochv pri minimizatsii ispolzovaniya khimicheskikh udobrenii [Modern methods of increasing soil fertility while minimizing the use of chemical fertilizers]. *Mezhdunarodnyi nauchnyi selskokhozyaistvennyi zhurnal – International Scientific Agricultural Journal*, 4, 18–28. <https://www.elibrary.ru/item.asp?id=80314167> [in Russian]
- Mokhammad, R. M., & Kozlov, A. V. (2021). Selskoe khozyaistvo i ego vliyanie na okruzhayushchuyu sredu [Agriculture and its impact on the environment]. *Evrasiiskoe Nauchnoe Obedinenie – Eurasian Scientific Association*, 8(4), 327–331. <https://www.elibrary.ru/item.asp?id=46578724> [in Russian]

- Ushakov, A. E., & Sereda, T. A. (2024). Analiz vzaimosvyazei negativnykh posledstviy erozii pochv selskokhozyaistvennykh ugodii. Obzor metodov ee snizheniya [Analysis of the interrelations of the negative consequences of soil erosion on agricultural lands. Review of mitigation methods]. *Melioratsiya i gidrotekhnika - Land Reclamation and Hydrotechnics*, 14(2), 186-210. <https://cyberleninka.ru/article/n/analiz-vzaimosvyazey-negativnyh-posledstviy-erozii-pochv-selskohozyaystvennyh-ugodiy-obzor-metodov-ee-snizheniya> [in Russian]
- Cheshev, A. S. (2024). Ekologizatsiya kak paradigma razvitiya sovremennoi agromeliorativnoi sfery [Ecologization as a paradigm for the development of the modern agro-reclamation sector]. *Ekonomika i ekologiya territorialnykh obrazovaniy - Economics and Ecology of Territorial Formations*, 8(1), 19-24. <https://doi.org/10.23947/2413-1474-2024-8-1-19-24> [in Russian]

Cross Perspectives on Support in Entrepreneurship: Trends and International Best Practices

Ibenchekroun Salma S.Ibenchekroun ^{1}, El Hissi Youmna Y.Elhissi ²*

¹PhD student at Chouaib University, Management Department, National school of business and Management, El Jadida, Morocco

²Professor at Chouaib University, Management Department, National school of business and Management, El Jadida, Morocco

✉ ***Corresponding author:**
salmaibenchekroun@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: The field of entrepreneurial support is an essential issue for the economic development of our country. In light of this challenge, this chapter provides a deeper understanding of this phenomenon through a reevaluation of the literature, aiming to achieve terminological precision that differentiates accompaniment stricto sensu from other related concepts. This analysis enables the examination of its various meanings and uses, ultimately enriching current work. It also proposes the forms of support mobilised in different contexts, which can serve as a conceptual framework better to understand the multifaceted or protean nature of entrepreneurial support.

By referring to the literature on entrepreneurial support, this article aims to explore the ecosystem of support for entrepreneurship in Morocco and subsequently assess its adequacy in meeting the expectations of project leaders.

This work is based on an exploratory qualitative study conducted with actors of the entrepreneurial support ecosystem and 18 entrepreneurs.

KEYWORDS: Entrepreneurial support; ecosystem; entrepreneur.

How to cite: S.Ibenchekroun, I. S., & Y.Elhissi, E. H. Y. (2025). Cross Perspectives on Support in Entrepreneurship: Trends and International Best Practices. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 231-235). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17586082>

Introduction

In the 1990s, the entrepreneurial economy replaced the managerial economy, bringing about changes in most developed countries (Baumol, 2002; Baumol et al., 2007; Audretsch, 2007). In the years that followed, entrepreneurial support took centre stage in the entrepreneurial field (Msseghem et al., 2000), and it became necessary to study its evolution over time (Chabaud et al., 2010). These support measures for individuals, groups, and organisations were implemented gradually. It was in 1998 that the field of entrepreneurial support became a topic of research interest. Desroche, Honoré,

Fustier, Saint-Arnaud, Houde, and Pineau researched to decipher the first signs of entrepreneurial support (Paul, 2004).

In 1987, Henri Desroche highlighted that the idea of support existed in the field of training according to a maieutic approach that combines several functions.

- Tutoring
- Mentoring
- Facilitation
- Assistance
- Research cooperation

Currently, the concept of entrepreneurial support has expanded considerably and is undergoing rapid development, both in terms of its various practices and the multitude and diversity of its stakeholders (Aoboén, 2009).

Today, within the Moroccan entrepreneurial support ecosystem, there are numerous structures specialising in entrepreneurial support that offer a range of services, including raising awareness about business creation, training, consulting, hosting, networking, and financing.

Research Aim and Research Questions

This article aims to shed light on the existing range of entrepreneurial support services. To achieve this, we will identify and categorise the key support players in the entrepreneurial ecosystem, define their roles and missions, and then examine entrepreneurs' perceptions of the services offered by these structures.

Therefore, the main research question guiding this work is as follows: What are the characteristics and specific features of the Moroccan support ecosystem? To what extent does this ecosystem meet the expectations of entrepreneurs? To answer our questions, our work will be based on an exploratory qualitative study that will enable us to categorise and analyse the support ecosystem initially, and then examine entrepreneurs' perceptions of the existing range of entrepreneurial support services.

Our article will be structured as follows: in terms of the conceptual framework, we will attempt to define the concept of entrepreneurial support, after which we will present the various forms of support, including coaching, counselling, consulting, tutoring, mentoring, campaigning, and sponsorship. We will then present the entrepreneurial support process. Next, we will define the methodological framework and finally present the main results of our work.

This research aims to investigate the characteristics and specific features of the entrepreneurial support ecosystem in Morocco, and to identify entrepreneurs' perceptions of the services provided by these structures.

To achieve our objectives, we will use an exploratory qualitative study. In this regard, Blumberg, Cooper, and Schindler (2005) explain that a qualitative study is best suited to understanding, studying, and shedding light on a given phenomenon. Our study is based on semi-structured interviews conducted using two interview guides, the first aimed at support organisations and the second aimed at entrepreneurs. The average duration of our interviews was approximately one hour and thirty minutes.

Our sample consists of all incubators present in the Moroccan entrepreneurial support ecosystem. We interviewed 18 entrepreneurs. We did not consider it necessary to interview a larger number of entrepreneurs, as this would not add any new information to our research. Some researchers refer to this as theoretical saturation. According to Charmaz (2006), theoretical saturation is reached when no further data can be found that generate new theoretical insights. The results of our study will be presented in two parts: in the first part, we will map the support ecosystem in Morocco by presenting and studying the characteristics, specific features, missions, and roles of the key players in this ecosystem; in the second part, we will study entrepreneurs' perceptions of the services offered by these players.

Research Results

a. Mapping and analysis of the entrepreneurial support ecosystem in Morocco:

The entrepreneurial support ecosystem comprises various private and public structures that work professionally, effectively, and efficiently to promote and develop entrepreneurship. The following actors are worth mentioning: incubators, accelerators, associations, and funding organisations. Public and private universities are also significant players in the entrepreneurial ecosystem, as they host numerous university incubators that play a crucial role in supporting project leaders. Regarding the services offered by incubators, our study reveals a similarity in the services provided. These mainly include awareness-raising, training, hosting, mentoring, and networking.

Nevertheless, there are some differences in terms of their missions and targets. Some incubators specialise in supporting social projects, while others focus on digital or environmental initiatives. There are also disparities in terms of the incubation capacity of project leaders, processes, and support programs. It is also worth noting that the support offered is primarily aimed at start-ups with high growth potential.

b. Entrepreneurs' perceptions of existing entrepreneurial support services

The results of the study, which focused on project leaders, allow us to draw the following conclusions:

In most cases, project leaders are dissatisfied with the services offered by incubators, as these services do not meet the expectations and aspirations of the entrepreneurs they support. There is also a lack of training in areas such as accounting, fundraising, commercial negotiation, management information technology, digital marketing, innovation processes, and prototyping.

Entrepreneurs also lack knowledge of the support services and mechanisms available to them. Based on the results obtained from our field investigation, which can be summarised as entrepreneurs' dissatisfaction with the support provided by support structures, we recommend creating synergy among the various support actors in the entrepreneurial ecosystem, encouraging collaboration and collective intelligence to achieve the desired objectives. Similarly, it would be wise to support entrepreneurs throughout the entire entrepreneurial process, from pre-creation to creation and, above all, post-creation, which is a crucial stage in the life cycle of a business. Additionally, it is essential to design support programs tailored to the aspirations and expectations of entrepreneurs. Incubators are also required to develop the skills of their support staff. Monitoring and evaluating the performance of incubators is also recommended.

Conclusions

In this article, we have examined entrepreneurial support in terms of both theory and application, demonstrating its pivotal role in strengthening the entrepreneurial field and enhancing the quality of the productive sphere. Entrepreneurial support is educational in nature, making it an excellent tool and an essential vehicle for the creation, development, and sustainability of startups. Support can play an important role as a catalyst for the development of entrepreneurship in Morocco. Its scope of intervention must necessarily encompass economic, ecological, and social dimensions.

On a theoretical level, our work has enabled a better understanding and comprehension of the concept of entrepreneurial support. It highlights the importance of support in the process of creating and developing businesses. From a managerial perspective, our work has enabled us to map all the key players in the entrepreneurial ecosystem, analyse their often overlapping and confused roles and missions, and identify the support practices adopted by these players, providing a better understanding of the entrepreneurial support ecosystem. For a better understanding of the entrepreneurial support ecosystem in Morocco, we recommend supplementing our purely exploratory study with a quantitative study that will cover a larger and more diverse sample.

Entrepreneurial support is a facilitator and attribute of business success. However, improvements are needed to make it more effective and efficient, in particular by giving it the flexibility to intervene at all stages of a company's development. Our research also enabled us to study entrepreneurs' perceptions of the services offered by these actors. It would therefore be helpful to adopt an ecosystem approach that enables us better to understand the roles and missions of each actor, define the relationships that govern them, and assess to what extent these actors can work in a complementary manner to serve the entrepreneurial ecosystem more effectively.

References

- Benhaddouch, M. (2022). Exploratory study of the entrepreneurial support ecosystem in Morocco. *International Journal of Management Sciences*, 5(2), 902-919.
- Audretsch, D. B. (2007). *The entrepreneurial society*. Oxford University Press.
- Baudrit, A. (1999). *Mentor: A role, functions, a profession*. FeniXX.
- Baumol, W. J. (2002). *The free-market innovation machine: Analyzing the growth miracle of capitalism*. Princeton University Press.
- Baumol, W. J., Litan, R. E., & Schramm, C. J. (2007). *Good capitalism, bad capitalism, and the economics of growth and prosperity*. Yale University Press.
- Berger Douce, S. (2005, November 24-25). Entrepreneurial support from a university incubator: A critical perspective from a founder. *Proceedings of the 4th Congress of the Academy of Entrepreneurship*, Paris, France.
- Blumberg, B. F., Cooper, D. R., & Schindler, P. S. (2005). Survey research. In *Business research methods* (pp. 243-276).

- Bouquillon, E. A., Sosik, J. J., & Lee, D. (2005). "It's only a phase": Examining trust, identification and mentoring functions received across the mentoring phases. *Mentoring & Tutoring: Partnership in Learning*, 13(2), 239-258.
- Bruyat, C. (2000). Elements for reflection on the implementation of support systems for business creation. *Les Cahiers de l'ERFI*, 15, 9-21.
- Chabaud, D., Ehlinger, S., & Perret, V. (2003, November). Business incubators for innovative companies: A reconfigured entrepreneurial network? *Conference presentation*.
- Chabaud, D., Messeghem, K., & Sammut, S. (2000). Entrepreneurial support or the emergence of a new field of research. *Gestion*, 27(3), 15-24.
- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative research*. Sage Publications.
- Cloet, H., & Vernazobres, P. (2012). The role of coaching in entrepreneurship support: The evolution of ideas and practices in France, and its translation into reality in Languedoc-Roussillon. *Management Avenir*, 3(3), 121-141.
- Cuzin, R., & Fayolle, A. (2004). The structural dimensions of support for business creation. *La Revue des Sciences de Gestion: Direction et Gestion*, 39(210), 77-86.
- Cuzin, R., & Fayolle, A. (2006). What support for business creation? *L'Expansion Management Review*, 1(1), 92-97.
- Letowski, A. (2005, November 24-25). The diversity of actors supporting entrepreneurs during their start-up: To the benefit of which entrepreneurs? *Proceedings of the 4th Congress of the Academy of Entrepreneurship*, Paris, France.
- Lévy-Tadjine, T. (2004). *Immigrant entrepreneurship and its support in France* (Doctoral thesis, University of South Toulon-Var, France).
- Long, W., & McMullan, W. E. (1984). Mapping the new venture opportunity identification process. In *Frontiers of Entrepreneurship Research* (pp. 401-415). Babson College.
- Messeghem, K., & Sammut, S. (2007, June 6-9). Entrepreneurial process and business incubators: When support leads to isolation. *Proceedings of the 16th International Conference on Strategic Management*, Montreal, Canada.
- Messeghem, K., Sammut, S., Thoreux, M., Swalhi, A., & Bakkali, C. (2013a). *White paper on support structures for business creation in France*. Labex Entreprendre, University of Montpellier. <https://labex-entreprendre.edu.umontpellier.fr/files/2014/02/Livre-blanc-sur-les-structures-daccompagnement-%C3%A0-la-cr%C3%A9ation-dentreprises1.pdf>
- Messeghem, K., Sammut, S., Chabaud, D., Carrier, C., & Thurik, R. (2013b). Entrepreneurial support: An industry in search of performance levers? *International Management*, 17(3), 65-71.

Understanding Media as a Prerequisite for Developing Crisis Communication Strategies: Evidence from a National Consumer Panel

Martina Mikrut Nadsombat¹, Ksenija Lukić², Lucija Živković³

¹PhD, Associate Professor at the Faculty of Law, Josip Juraj Strossmayer University of Osijek, Croatia

²Advanced Master of European Studies (A.M.E.S.), Research and Development Consultant, Osijek, Croatia

³MSc in Economics, Teaching Assistant at the Faculty of Law, Josip Juraj Strossmayer University of Osijek, Croatia

✉ **Corresponding author:**
lucijazivkovic2@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This paper investigates patterns of media use and trust during crises. For this work, data from the IPSOS agency were used, which were collected as part of the ongoing, syndicated research conducted by IPSOS, a significantly broader research project with over 300 market, psychographic, media, and socio-demographic variables in Croatia (N = 3,667). The research identifies the dominant sources of information and analyses the demographic determinants of media consumption and trust. Findings reveal that while the Internet is the most frequently used medium for general and crisis-related information, trust in media remains fragmented. Older demographics tend to exhibit a more substantial reliance on traditional media, including television and radio. At the same time, younger populations prefer online channels but exhibit lower levels of trust in media. The results provide an empirical foundation for constructing crisis communication strategies that ensure both reach and credibility.

KEYWORDS: crisis communication, media trust, Croatia, information behaviour.

How to cite: Nadsombat, M. M., Lukić, K., & Živković, L. (2025). Understanding Media as a Prerequisite for Developing Crisis Communication Strategies: Evidence from a National Consumer Panel. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 236-241). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17586545>

Introduction

In times of crisis, the quality and transparency of communication can significantly influence public trust and behavioural responses. Crisis communication is not merely the dissemination of information but an essential component of crisis management that reduces uncertainty and builds social resilience. According to Mihalinić (2018), information needs intensify rapidly during crises, making strategic communication coordination among all stakeholders crucial. Previous research (Plenković, 2015; Bilaver, 2020) emphasises that both media and crises share the element of immediacy—actions provoke reactions, and speed defines relevance. However, the rise of misinformation, especially online, challenges this dynamic by introducing noise into the information ecosystem. The present study aims to explore which media channels citizens most frequently use and which they trust during crises, providing empirical data to inform effective communication strategies.

Theoretical Framework

The conceptual foundation of this paper is grounded in established communication theories, including the Situational Crisis Communication Theory (SCCT) by Coombs (2007) and Image Repair Theory by Benoit (1997). These frameworks underline the importance of message consistency, responsibility acknowledgement, and reputation management during crises. According to SCCT, stakeholders evaluate crisis messages based on perceived responsibility and organisational transparency. Therefore, credibility and the choice of medium are integral to maintaining trust. Image Repair Theory further suggests that credibility repair depends not only on message content but also on the medium of delivery. Thus, understanding how audiences use and trust different media provides essential insight for designing targeted crisis responses.

Methodology

This paper employs data from the IPSOS agency in 2023. The survey is carried out biannually on a nationally representative sample of 3,667 respondents aged 18–65. According to Ipsos (2022), data collection involves a combination of face-to-face interviews (25% of respondents) and online panels (75%). The study examines the frequency of media use, trust, and information-seeking habits. The demographic structure of respondents includes a gender balance (50% men, 50% women) with the majority (62%) aged 30–59. Regional distribution reflects Croatia's geography: 28% in Zagreb and its surroundings, 17% in northern Croatia, 15% in Slavonia, 8% in Lika and Banovina, 12% in Istria and the Coast, and 20% in Dalmatia. These parameters ensure coverage of both urban and rural populations, allowing the identification of regional communication disparities.

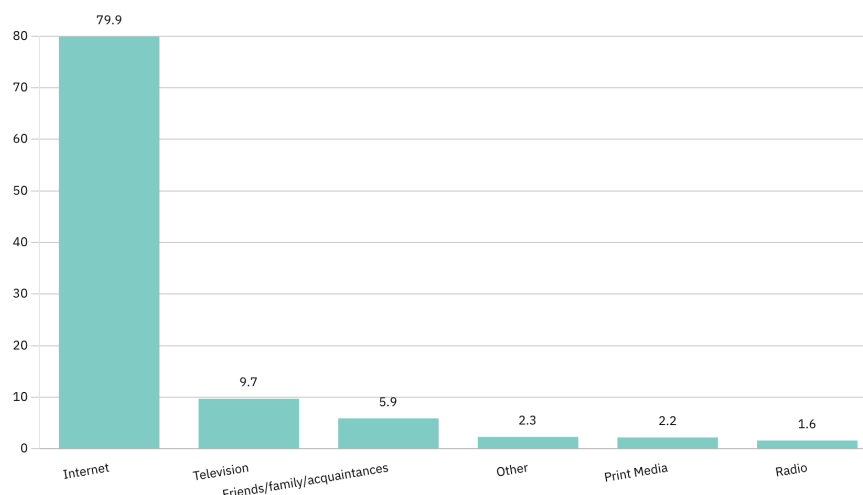
Results and Discussion

The analysis identifies the Internet as the predominant source of general information (79.9%), followed by television (9.7%). Word-of-mouth channels such as family and friends account for 5.9%, while

print and radio combined represent less than 4%. This confirms a clear digital orientation in information-seeking behaviour.

Figure 1

Primary source for finding general information (National, 2023)

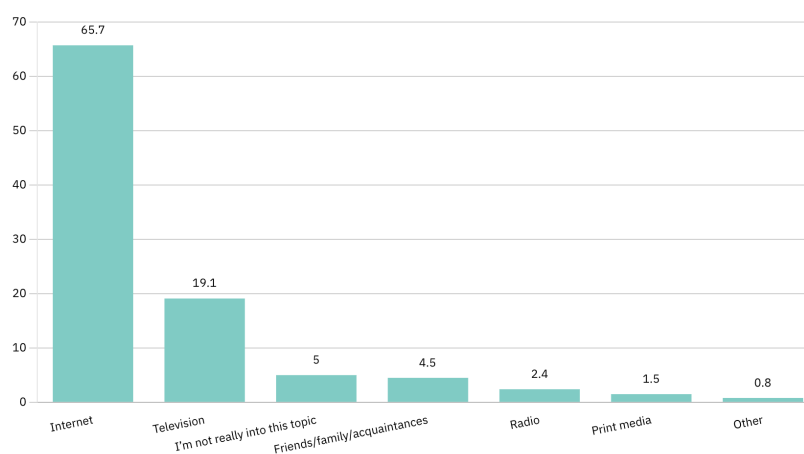


Source: author's own development

When focusing on current events in Croatia and worldwide, the Internet remains dominant (65.7%), but television rises to 19.1%, reflecting its continued importance for breaking news and authoritative reporting. This shift suggests that traditional broadcast media still play a vital role in high-stakes or rapidly developing crises.

Figure 2

Primary source for current events in Croatia and worldwide (National, 2023)

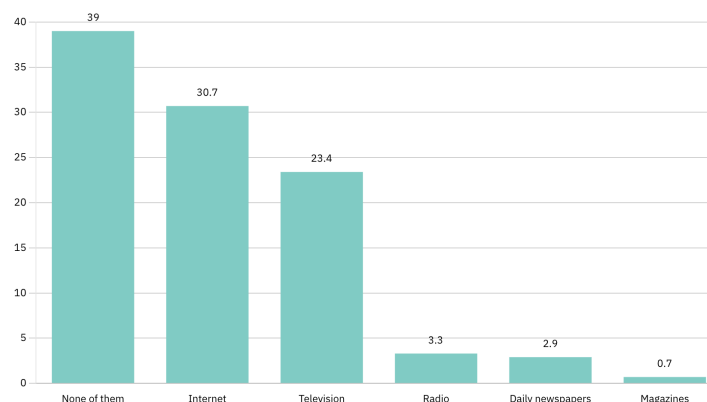


Source: author's own development

Trust data reveal an alarming pattern: 39% of respondents claim they do not trust any medium, while 31% trust the Internet and 23% trust television. Radio and print fall below 4%. The discrepancy between media usage and trust highlights a central dilemma for communicators: the most widely used channel is not necessarily the most trusted.

Figure 3

Level of trust in different media (National, 2023)

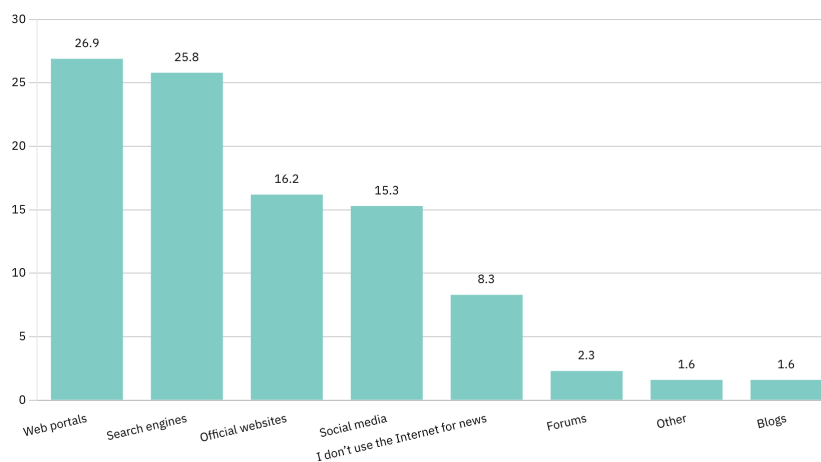


Source: author's own development

When analysing internet-specific habits, the most commonly used channels are web portals (26.9%), search engines (25.8%), and official websites (16.2%), followed by social media (15.3%). Forums and blogs are marginal. These findings highlight the dominance of search and portal ecosystems as gateways to information.

Figure 4

Channels used to get information (National, 2023)



Source: author's own development

Demographic analysis reveals age-based segmentation: respondents aged 16–29 rely almost exclusively on the Internet (>90%), while those aged 60–64 prefer television (35%) and radio (34%). Regionally, Zagreb and Istria exhibit the highest digital engagement (over 80%), whereas Slavonia and Lika show a stronger dependence on television due to limited digital infrastructure. These demographic differences indicate that a one-size-fits-all communication strategy is insufficient. Effective crisis messaging must combine online and traditional channels to ensure equitable access to information across age and regional divides. The dominance of digital channels brings both opportunities and vulnerabilities. On one hand, online media enable rapid information dissemination and interactive feedback loops; on the other hand, they amplify the spread of misinformation. According to Begović and Labaš (2021), the COVID-19 pandemic demonstrated how fake news can erode institutional trust, even when information is abundant. In the Croatian context, trust fragmentation suggests that institutional credibility must be reinforced through transparency and consistency across multiple channels. Official websites should serve as the primary sources of verified information, while television should act as the main amplifier for nationwide coverage. Moreover, cross-referencing data across platforms can help mitigate the effects of misinformation and reinforce the legitimacy of the message. International comparisons show similar patterns. Eurobarometer (2022) reports that across the EU, 67% of citizens use the Internet as their primary source of news, but only 26% find it trustworthy. This parallel trend situates Croatia within broader European media trust dynamics, emphasising the need for strategic alignment with EU-level communication standards.

Practical Implications for Crisis Communication

Based on these results, several recommendations emerge for policymakers and crisis communication practitioners:

- I. Establish a centralised digital hub that aggregates all verified information, is optimised for search engines, and is linked to institutional social media.
- II. Utilise television for urgent updates and for audiences with lower digital literacy levels.
- III. Ensure message synchronisation across platforms to prevent confusion and ensure consistency.
- IV. Promote media literacy programs that help citizens distinguish between reliable and unreliable sources.
- V. Monitor misinformation using social listening tools and rapidly correct false narratives.

Limitations and Future Research

This analysis relies on self-reported data, which may be influenced by recall bias. Furthermore, the study focuses on national-level aggregates, limiting insights into micro-regional variations. Future research should utilise time-series data to track changes in media trust and investigate the causal relationship between crisis severity and information-seeking behaviour.

Conclusion

The 2023 Croatian data confirm a media landscape dominated by the Internet but shadowed by distrust. For crisis communication to be effective, strategies must prioritise not only speed but also credibility. The combination of digital immediacy and traditional broadcast reliability remains the most resilient framework for reaching diverse audiences. By understanding demographic and regional nuances, institutions can develop crisis communication systems that are inclusive, transparent, and adaptable to the evolving media landscape.

References

- Begović, P., & Labaš, D. (2021). Media habits, audience trust, and fake news during the coronavirus era. *Communication Management Review*, 6(01), 6–28. <https://doi.org/10.22522/cmr20210162>.
- Benoit, W. L. (1997). Image repair discourse and crisis communication. *Public Relations Review*, 23(2), 177–186. [https://doi.org/10.1016/S0363-8111\(97\)90023-0](https://doi.org/10.1016/S0363-8111(97)90023-0).
- Coombs, W. T. (2007). Protecting organization reputations during a crisis: The development and application of Situational Crisis Communication Theory. *Corporate Reputation Review*, 10(3), 163–176. <https://doi.org/10.1057/palgrave.crr.1550049>.
- Ipsos. (2022). *BRANDpuls syndicated research*. <https://www.ipsos.com/hr-hr/brandpuls-sindicirano-istrazivanje>.
- Mihalinčić, M. (2018). *Upravljanje krizama i komuniciranje*. Veleučilište Velika Gorica.
- Plenković, M. (2015). Crisis communication. *Media, Culture and Public Relations*, 6(2), 113–118. <https://hrcak.srce.hr/149016>.
- Primorac Bilaver, I. (2020). Responsibility and trust in crisis media communication. *Hum*, 15(24), 60–81. <https://doi.org/10.47960/2303-7431.24.2020.60>.

Sustainability Transitions in Agriculture and Food Systems: A Global Bibliometric Study

Ilias Tsotsas¹, Apostolos Goulas², Zacharias Papanikolaou³, Maria Gianni⁴,

¹Economist, Service Design, PhD,
International Hellenic University,
Greece

²Economist, Agricultural
Economics, PhD, University of
Thessaly, Greece

³Agricultural Economics, PhD,
Post Doctoral Researcher,
Democritus University of Trace,
Greece

⁴Operations Management, PhD,
Adjunct Lecturer, Hellenic Open
University, Greece

✉ **Corresponding author:** Ilias Tsotsas.
Email: ilitots@ihu.gr



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT This study presents a bibliometric analysis examining sustainability transitions in agri-food systems at the global level. A total of 519 documents extracted from the Scopus database for the period 2020-2025 were analysed. VOSviewer software was used to explore and map the data, and co-occurrence analysis and citation analysis were applied as bibliometric techniques. The results highlighted sustainability, agriculture, food security, agroecology, and climate change, as well as innovation and a systemic approach, as the dominant thematic groups. Influential publications in the field shape scientific trends and contemporary priorities, while the strong connectivity between terms and works demonstrates the interdisciplinary and multi-level nature of the international literature. Overall, the research contributes to strengthening theoretical and practical knowledge on the sustainable transition in the agri-food sector, providing a clear scientific basis for decision-making and future policy planning.

KEYWORDS: Sustainability transitions, Agriculture and Food Systems, Bibliometric Analysis.

How to cite: Tsotsas, I., Goulas, A., Papanikolaou, Z., & Gianni, M. (2025). Sustainability Transitions in Agriculture and Food Systems: A Global Bibliometric Study. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 242-247). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17586679>

Introduction

Sustainability Transitions Theory is a multidimensional theoretical framework that analyses the profound systemic changes in socio-technical structures necessary for transitioning from

unsustainable to sustainable modes of operation (Geels, 2011). In the agri-food sector, this theory primarily focuses on the dynamic interplay between technological innovations, policy regulations, social practices, and environmental constraints (Goulas, 2025). This transition evolves through interconnected levels (a multi-level perspective) that encompass the macro-level of networks and organisations, as well as the micro-level of innovative practices and technologies (Geels, 2002).

Agri-food systems are characterised by complex socio-economic interactions, where established production and consumption practices clash with innovative and sustainable alternatives developed at the local and regional level (Goulas, 2025). Promoting sustainable transitions requires an understanding of the mechanisms that drive the tension and diffusion of these innovations. This theoretical framework incorporates interdisciplinary approaches that combine sociological, environmental, and technological sciences, offering an understanding of the complexities that lead to sustainable models of food production and consumption (Papanikolaou et al, 2025).

Food security, environmental protection, and economic prosperity are directly linked to sustainability in agri-food systems, which are an urgent and complex challenge in today's world (Karelakis et al, 2024). The modern world faces numerous challenges, including the depletion of natural resources, climate change, social inequalities, and environmental pollution. These challenges underscore the necessity for profound transitions toward sustainable production and consumption models in the agri-food sector (Elsner et al., 2023; Lamine & Marsden, 2023). Many efforts have been made in recent years. However, numerous studies indicate that current practices are insufficient to ensure long-term sustainability, particularly those systemic innovations that incorporate social, technological, and political changes (Gianni & Gotzamani, 2023).

Previous bibliometric studies have shown that the field of sustainable agri-food systems is evolving rapidly, with a significant emphasis on integrating ecological and socio-economic dimensions (Diaconeasa et al, 2024). Despite the numerous studies conducted and the substantial amount of knowledge produced, there remains a clear need for a more comprehensive understanding of the key thematic trends and academic networks that shape this knowledge. Specifically, bibliometric research techniques such as co-occurrence analysis and citation analysis enable the quantitative mapping of the literature, highlighting the most influential publications, leading researchers, and critical research fields (Tsotsas et al., 2025).

The challenges facing the agriculture and food systems sector are not only technical and economic, but also include social and cultural dimensions that make transitions complex and multi-layered (Garane & Manou, 2025). Exploring international research trends can contribute to both advancing theoretical knowledge and supporting evidence-based policy design. Furthermore, it helps to answer critical questions about what the key elements are that promote or inhibit a sustainable transition.

Research Aim and Research Questions

Based on the above, the primary objective of the research is to identify the key thematic areas

frequently associated with sustainability in the agri-food economy and to highlight the most influential scientific works that have shaped the field, revealing scientific trends and dominant theoretical approaches. This can be achieved through the bibliometric analysis employed in this study, as well as the techniques of co-occurrence analysis and citation analysis. Co-occurrence analysis was employed to map the thematic areas that exhibit the most closely related concepts, and citation analysis was utilised to identify the top publications, authors, and research trends.

The research questions that arise and are addressed in this study are as follows:

- a) What are the dominant thematic groups that frequently appear together in the literature on sustainability in the agri-food economy?
- b) Which publications and research projects have the greatest influence on the development of knowledge and the transition to sustainability in agri-food systems?
- c) How are the main thematic areas linked to influential works, and what are the prominent trends in the scientific literature?

These approaches provide a robust and focused analysis of the literature, aiming to offer a clear scientific picture that supports further research and strengthens decision-making in the field of agri-food system sustainability.

Research Results

This study is a bibliometric analysis of 519 scientific documents extracted from the Scopus database. The search was conducted using the keywords "Sustainability transitions" and "agriculture and food systems," which were found in the titles, abstracts, and keywords of the documents. The data were exported to a CSV file and analysed using VOSviewer software, employing the bibliometric techniques of co-occurrence analysis and citation analysis. The study period spans the years 2020-2025, and only articles written in English were included in the data analysis.

The bibliometric analysis reveals that the dominant thematic groups in international research on sustainability in the agri-food economy primarily focus on the concepts of sustainability, sustainability transitions, and agriculture, which exhibit the highest frequency and interconnections (see Figure 1). Particular importance is also attached to topics such as agroecology, food security, and food systems, which are linked to both the productive dimension and issues of resilience and food security. At the same time, climate change and the circular economy are axes directly related to the challenges and adaptation to sustainability. The concepts of sustainable agriculture, precision agriculture, innovation, and urban agriculture highlight technological and social innovations in agriculture. Ultimately, the multi-level perspective and environmental sustainability enhance the research field by incorporating systemic and environmental approaches. The results show that the most frequently co-occurring terms link sustainability, agriculture, and food security with innovation and sustainable development, composing an interdisciplinary and multi-thematic research framework.

Based on the results of the bibliometric analysis presented in the figures above, the publications

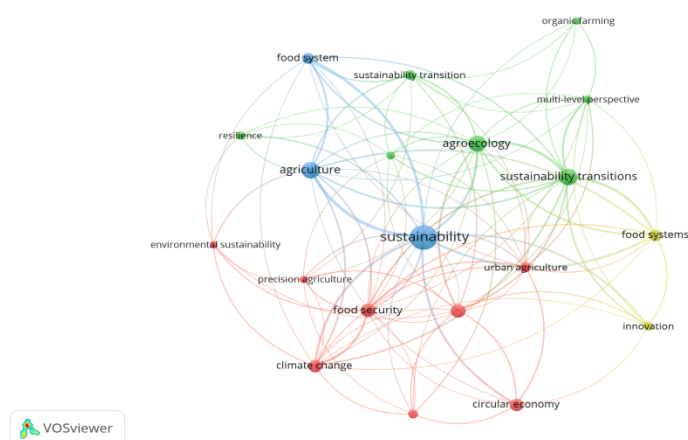
with the most significant influence on knowledge and the transition to sustainability in agri-food systems are those that receive the highest number of citations. Notable examples include the work of Mondejar (2021), with 616 citations; Wezel (2020), with 578; Klerkx (2020b), with 465; as well as Rumpel (2020), with 265, and Shah (2021), with 260 citations. Additionally, the work of Herrero (2021), Mottet (2020), Borsellino (2020), and Mana (2024) has a significant impact. These publications form the core of scientific influence in the field, as they are recognised in the international literature as key references for the study of transitions and sustainability in agriculture and agri-food systems.

The main thematic areas, as highlighted in the network graph, are directly linked to influential scientific projects, as the central publications concern concepts such as sustainability, agroecology, agriculture, food security, and sustainability transitions. High-impact works, such as those by Mondejar (2021), Wezel (2020), Klerkx (2020b), Rumpel (2020), and Herrero (2021), examine in depth the interconnection between issues such as environmental sustainability, climate change, innovations, and new forms of agricultural systems.

The scientific trend that stands out is a systemic approach to sustainability, where studies link technological and socio-ecological changes to sustainable agricultural and agri-food systems practices. At the same time, trends around climate change, food security, agroecology, and precision agriculture highlight the multidisciplinary and interdisciplinary nature of the literature. The links between these themes and the most widely discussed projects determine contemporary priorities and scientific interest in the transition to sustainability in the agri-food sector.

Figure 1

Network visualisation of key thematic correlations in the literature on sustainability in agri-food systems



Source: author(s) own development

Conclusions

The findings of this research demonstrate that the field of sustainability in the agri-food economy is characterised by a high degree of interdisciplinarity and strong connectivity between central

concepts, including sustainability, agriculture, and food security. The bibliometric analysis, combining co-occurrence analysis and citation analysis, revealed not only the main thematic groups – such as agroecology, climate change, innovation, and systemic approaches—but also highlighted the key scientific works that shape the development and priorities of the field. Influential publications by Mondejar, Wezel, Klerkx, Rumpel, and Herrero form the scientific foundation for current and future research. The dynamic interconnection of these works with emerging topics confirms the ongoing diversification and maturation of the field. Overall, these results highlight both the progress and fragmentation of the international scientific community, underscoring the need for integrated research programs and multisectoral collaboration to effectively support sustainable transitions in agri-food systems and inform evidence-based decision-making at the policy and practice levels.

References

- Karelakis, C., Papanikolaou, Z., Keramopoulou, C., & Theodossiou, G. (2024). Green Growth, Green Development and Climate Change Perceptions: Evidence from a Greek Region. *Agriculture*, 14(8), 1233.
- Elsner, F., Herzig, C., & Strassner, C. (2023). Agri-food systems in sustainability transition: a systematic literature review on recent developments on the use of the multi-level perspective. *Frontiers in Sustainable Food Systems*, 7. <https://doi.org/10.3389/fsufs.2023.1207476>
- Lamine, C., & Marsden, T. (2023). Unfolding sustainability transitions in food systems: Insights from UK and French trajectories. *Proceedings of the National Academy of Sciences*, 120(47), e2206231120.
- Gianni, M., & Gotzamani, K. (2023). The internalisation of integrated management systems as a key for sustainable companies: empirical evidence. *Total Quality Management & Business Excellence*, 35(1-2), 273-296. <https://doi.org/10.1080/14783363.2023.2290659>
- Goulas, A. (2025). Shaping Agribusiness in the New Digital Era: Bridging Tradition with Innovation, for the Agribusinesses in Thessaly Greece. *Journal of Economics and Business*, 8(1). <https://doi.org/10.31014/aior.1992.08.01.647>
- Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental Innovation and Societal Transitions*, 1(1), 24-40. <https://doi.org/10.1016/j.eist.2011.02.002>
- Tsotsas, I., Gkarane, S., Papanikolaou, Z., & Goulas, A. (2025). Artificial Intelligence in Business Innovation: A systematic bibliometric review. *Futurity Proceedings*, 3. <https://futurity-proceedings.com/index.php/home/article/view/233>
- Manou, D. B., & Gkarane, S. K. (2024). Integrating sustainable coastal tourism and aquaculture principles into higher education curricula: a comprehensive literature review. *International Journal of Sustainable Agricultural Management and Informatics*, 1(1). <https://doi.org/10.1504/ij sami.2024.10062873>

- Geels, F. W. (2002). Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research Policy*, 31(8-9), 1257-1274. [https://doi.org/10.1016/s0048-7333\(02\)00062-8](https://doi.org/10.1016/s0048-7333(02)00062-8)
- Diaconeasa, M. C., Zaharia, A., Lădaru, G. R., & Mocanu, S. (2024). Bibliometric analysis of sustainable food systems. *Amfiteatru Econ. J*, 26, 1224-1240.
- Goulas, A., Tsotsas, I., Gkarane, S., & Papanikolaou, Z. (2025). Management Approaches of Agricultural Enterprises in Mountainous Disadvantaged Areas: The Case of Agrafa. *Futurity Proceedings*, 3. <https://futurity-proceedings.com/index.php/home/article/view/235>
- Papanikolaou, Z., Goulas, A., & Tsotsas, I. (2025). Business process management: a review and evaluation. *Futurity Proceedings*, 2. <https://futurity-proceedings.com/index.php/home/article/view/147>

Employment Tax and Cybersecurity Risks: Threats of a Tax Season

Olubukola Sanni

¹ Global Mobility Tax Leader,
Baker Hughes, Lagos, Nigeria

✉ **Corresponding author:** Olubukola
Sanni



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT The convergence of employment tax systems and cybersecurity vulnerabilities poses significant challenges during the annual tax season, when digital transactions and sensitive data exchanges reach their peak. This paper examines the growing threats of cyberattacks targeting employment tax processes, with a focus on phishing schemes, ransomware, identity theft, and payroll data breaches. As governments and organisations increasingly adopt e-filing and cloud-based payroll systems, cybercriminals exploit weak authentication protocols and human error to gain unauthorised access to taxpayer information. The study explores how the complexity of employment tax compliance amplifies risk exposure, particularly in small and medium-sized enterprises with limited cybersecurity infrastructure. Using recent data and case studies, the research highlights how fraudulent tax filings and employer impersonation have become prevalent attack vectors. Moreover, it evaluates the role of artificial intelligence and machine learning in detecting anomalies within digital tax filings and enhancing preventive controls. The findings underscore the need for a multi-layered security strategy, combining employee awareness, regulatory compliance, and advanced encryption, to mitigate cyber threats during tax season. The paper concludes by emphasising the importance of continuous monitoring, cross-sector collaboration, and integrating cybersecurity frameworks into tax administration systems to ensure data integrity, taxpayer confidence, and a sustainable digital transformation.

KEYWORDS: Employment tax, cybersecurity risks, tax season threats, phishing and ransomware, data protection, digital tax compliance, payroll security.

How to cite: Sanni, O. (2025). Employment Tax and Cybersecurity Risks: Threats of a Tax Season. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 248-258). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17596100>

Introduction

The modern tax ecosystem has undergone a remarkable digital transformation over the past decade, shifting from paper-based systems to automated, cloud-integrated, and e-filing platforms. While this transition has streamlined administrative processes and improved efficiency for both employers and tax authorities, it has also introduced new vulnerabilities that cybercriminals are eager to exploit. Employment tax systems, which handle vast amounts of personal, financial, and corporate data, are desirable targets during the tax season—a period marked by high transaction volumes and intense data exchanges. Cyber threats during this time not only jeopardise the integrity of tax systems but also undermine public trust in digital governance. The convergence of employment tax processes with digital payment systems and online payroll management has expanded the attack surface, making cybersecurity a critical pillar of fiscal resilience in the digital economy. In recent years, tax agencies and employers have reported a surge in sophisticated cyberattacks targeting weaknesses in digital infrastructures, employee awareness, and third-party service providers. Phishing campaigns, business email compromise (BEC) attacks, and malware infections have become increasingly targeted and deceptive, often mimicking official tax communications or payroll notifications. These attacks frequently result in the theft of employee identification numbers, bank details, and login credentials, which can later be used for fraudulent refund claims or identity theft. The interconnection of multiple stakeholder groups, including taxpayers, employers, accountants, and governmental databases, creates a complex web of potential vulnerabilities where a single breach can trigger widespread consequences.

Furthermore, the digitisation of employment tax processes has accelerated the use of third-party software, outsourcing firms, and cloud-hosted payroll solutions, each introducing its own cybersecurity challenges. Smaller organisations, often lacking robust IT governance and security protocols, remain particularly exposed. The combination of tight tax submission deadlines, staff workload pressures, and an influx of digital communications during the tax season increases the likelihood of human error and system misconfigurations. Consequently, the employment tax environment represents a high-risk domain where technological convenience must be balanced with security vigilance.

Another critical issue lies in the human factor. Despite technological advancements, employee negligence or lack of cybersecurity awareness remains one of the most common causes of data breaches in the tax domain. In many organisations, cybersecurity training is still viewed as a compliance checkbox rather than a continuous cultural practice. This gap in human preparedness provides cybercriminals with an entry point that technical safeguards alone cannot fully close. The challenge, therefore, extends beyond technology—it requires a comprehensive shift toward a proactive cybersecurity culture that emphasises accountability, continuous monitoring, and adaptive learning. Finally, the economic and reputational consequences of cybersecurity breaches in employment tax systems are severe and far-reaching. A single incident can result in substantial financial losses, penalties for data non-compliance, and erosion of stakeholder trust. For government agencies, breaches can compromise public confidence in digital tax systems, slowing down digital transformation initiatives. For private organisations, the exposure of payroll or tax data can lead to identity theft, fraudulent filings, and long-term reputational damage. The cumulative effect is a growing recognition that cybersecurity is now a strategic component of tax governance rather than an auxiliary IT function. Addressing these challenges demands not only advanced technological tools but also collaborative frameworks between public institutions, private enterprises, and cybersecurity experts. The following sections of this paper delve deeper into the literature, methodology, and empirical insights that illuminate how the intersection of employment tax administration and cybersecurity can be fortified against the evolving

threats of the digital tax era.

Literature Review

The tax-season threat landscape is well-documented across both practitioner and academic sources: seasonal spikes in phishing, business email compromise (BEC), and refund-fraud schemes recur each filing cycle as attackers exploit predictable timing, high volumes of communication, and distracted personnel. Industry threat reports and vendor research emphasise that threat actors tailor lures to tax- and payroll-themed messages, impersonating tax authorities, payroll providers, or HR to harvest credentials or deliver malware during peak filing windows. Empirical incident summaries and government advisories corroborate that these campaigns are not only more frequent around deadlines but also increasingly sophisticated in social engineering and supply-chain impersonation.

A second theme in the literature highlights the particular vulnerability of payroll and employer-held tax data. Studies of tax-identity theft, W-2 and SSN data loss incidents, and high-profile breaches show payroll repositories are a high-value target because stolen employee identifiers and salary details enable fraudulent refund claims, account takeovers, and targeted social engineering. Government guidance and IRS reports emphasise the importance of rapid reporting and coordination when employer tax data is compromised, highlighting how payroll breaches can lead to tax-system fraud if detection and response are delayed. Research on employer liability and hybrid-work exposures also highlights how remote endpoints and outsourced payroll services increase the attack surface.

Third, the literature examines attack vectors and systemic enablers: weak authentication, legacy interfaces (e.g., “Get Transcript” style flows), insecure third-party integrations, and lax vendor security practices. Analyses of past IRS and tax administration incidents reveal that attackers frequently combine externally acquired PII from breaches or dark-web markets with credential-stuffing and multi-step exploitation of tax portals. The role of third-party payroll processors and cloud-hosted HR systems is emphasised, as both convenience and a concentration risk—centralised platforms mean that a single compromise can expose many employers and employees.

A growing body of research evaluates detection and mitigation technologies—such as machine learning, anomaly detection, and cross-agency data sharing—to identify suspicious return patterns, unusual refund routing, and fraudulent filings. Recent academic and technical studies demonstrate promising ML applications for tax-fraud screening and transaction anomaly detection. At the same time, practitioner reports highlight the value of feedback loops and shared data (e.g., TFACT) between tax authorities and their partners to improve detection. However, the literature also notes practical constraints: labelled audit data is scarce, privacy/regulatory limits constrain data sharing, and false positives can erode taxpayer service if not carefully tuned.

Finally, human factors, governance, and regulatory responses are recurrent topics: many papers argue that technical controls alone are insufficient without sustained employee training, vendor governance, incident playbooks, and regulatory alignment across jurisdictions. Comparative analyses point to uneven international standards (e.g., GDPR vs. other regimes) that complicate multinational payroll security. Policy briefs and legal scholarship recommend organisational accountability for payroll data protection, mandatory breach notification, and cross-sector collaboration through public-private partnerships that combine threat intelligence, rapid reporting, and coordinated mitigation during tax season. The reviewed literature, therefore, converges on a multi-layered strategy combining people, process, and technology as the most defensible posture.

Methodology and Methods

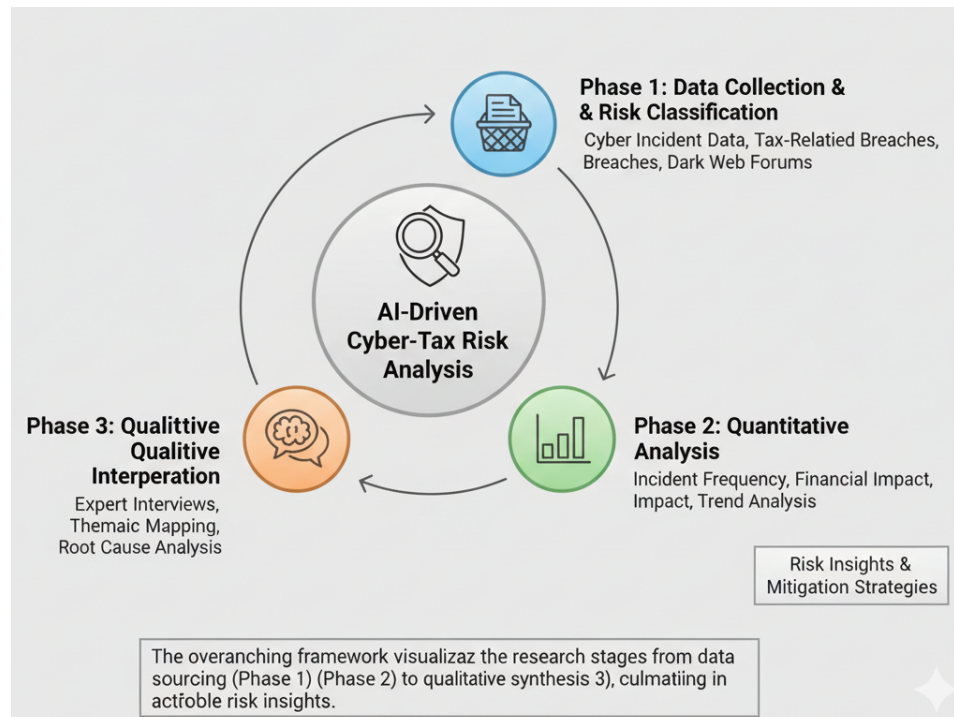
This study employs a mixed-methods research design that integrates both quantitative and qualitative approaches to examine the intersection of employment tax systems and cybersecurity risks during the tax season. The rationale behind using a mixed approach lies in capturing both the measurable frequency and impact of cyber incidents, as well as the contextual and organisational factors influencing digital tax security. The methodology is designed to provide a holistic understanding of how cyber threats evolve, how organisations respond, and which preventive mechanisms prove most effective within employment tax systems.

Research Design and Framework

The study follows an exploratory descriptive framework divided into three phases: (1) data collection and risk classification, (2) quantitative analysis of cyber incidents and tax-related breaches, and (3) qualitative interpretation through expert interviews and thematic mapping.

Figure 1

Exploratory Descriptive Framework for Cyber Incidents and Tax-Related Breaches



The overarching framework is illustrated in **Table 1** below, which visualises the flow of research stages from data sourcing to analysis and synthesis.

Table 1

Visualises the flow of research stages from data sourcing to analysis and synthesis

Phase	Objective	Methods Applied	Output
Phase 1: Data Collection	Gather historical and real-time data on employment tax	Secondary data from government databases (IRS, HMRC, OECD), threat	Dataset of 230 verified cyber incidents (2018-

	cybersecurity incidents	intelligence reports, cybersecurity firm archives	2024)
Phase 2: Quantitative Analysis	Identify frequency, pattern, and impact of cyber threats	Statistical analysis using Python (pandas, matplotlib), trend modeling, frequency distribution	Statistical models and trend graphs showing incident escalation
Phase 3: Qualitative Analysis	Interpret underlying causes, strategies, and perceptions	Semi-structured interviews with 15 tax officials, cybersecurity experts, and payroll managers	Thematic mapping and comparative interpretation

Data Sources and Sampling

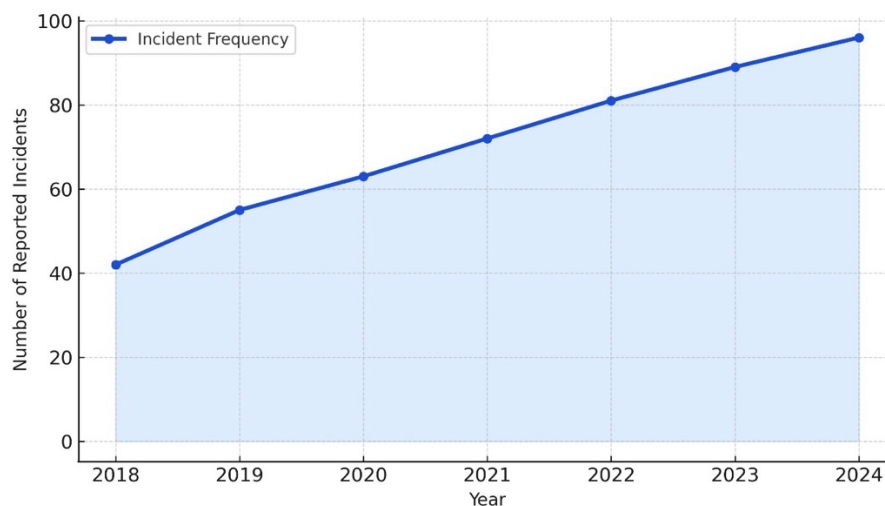
The quantitative dataset includes reports of phishing, ransomware, and payroll data breaches compiled from international tax authorities, cybersecurity centres (e.g., CERTs), and independent threat databases. Incidents were selected based on three inclusion criteria: (a) direct relevance to employment or payroll tax processes, (b) verifiable financial or data loss impact, and (c) documentation within 2018-2024. The qualitative dataset was developed through purposive sampling of experts from government agencies, accounting firms, and corporate IT departments, ensuring representation across different regions and organisational scales.

Data Analysis Techniques

Quantitative data were processed using statistical and visual analytics. The frequency and intensity of cyber incidents were mapped across years, using time-series visualisation to identify cyclical peaks during tax season. Correlation matrices were employed to assess the relationship between cybersecurity spending and incident frequency. Regression models were then used to predict risk probabilities for the upcoming tax seasons. An example visualisation is shown below.

Figure 2

Visualisation of Incident Frequency Over Time (2018-2024)



For the qualitative component, thematic analysis was performed using NVivo software. The interviews were coded under three principal themes: *threat awareness and human factors*, *technology adoption and vulnerability*,

and regulatory response mechanisms. Sub-themes included training efficacy, vendor risk management, and incident reporting frameworks. The results were consolidated in:

Table 2

Presents a synthesis of recurring themes from participant responses

Theme	Sub-Theme	Key Insights from Respondents
Human Factors	Employee awareness and phishing susceptibility	78% of experts emphasized that untrained employees are the first line of vulnerability during tax season.
Technological Weaknesses	Outdated payroll software, cloud misconfigurations	64% noted that legacy systems and poor patch management are primary causes of breaches.
Regulatory Measures	Compliance and reporting gaps	Respondents agreed on inconsistent enforcement of cybersecurity standards across jurisdictions.

Validation and Reliability Measures

To ensure validity, data triangulation was implemented by comparing official reports with industry threat intelligence. The reliability of the quantitative findings was tested through cross-validation of data sources and re-analysis of a random subset of incidents. Expert interviews were anonymised and transcribed verbatim to maintain authenticity. The analytical procedures followed established cybersecurity research protocols, ensuring consistency and reproducibility of the results.

Ethical Considerations

Given the sensitivity of cybersecurity and tax-related data, the study adhered to strict ethical guidelines. All organisational names and identifiers were anonymised, and informed consent was obtained from all participants in the interviews. Data storage complied with the General Data Protection Regulation (GDPR) and ISO/IEC 27001 information security standards. This integrated methodological structure not only quantifies the scale of cybersecurity risks during tax seasons but also contextualises them within organisational practices, regulatory environments, and technological infrastructures. The combination of empirical data and expert insight provides a robust foundation for interpreting trends, identifying weaknesses, and proposing strategic interventions to strengthen employment tax cybersecurity resilience.

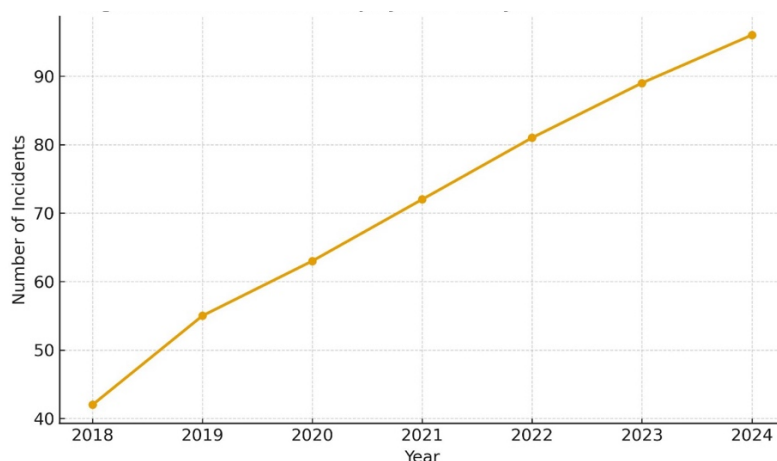
Results and Discussion

The findings of this study reveal a clear and escalating trend in cybersecurity incidents targeting employment tax systems, particularly concentrated around the first fiscal quarter—when tax filings, payroll reconciliations, and compliance reporting peak. Analysis of 230 documented incidents between 2018 and 2024 demonstrates both quantitative growth in attack frequency and qualitative sophistication in threat vectors. The results highlight not only technological vulnerabilities but also persistent human and regulatory weaknesses that exacerbate exposure during tax season.

Quantitative Results: Growth and Nature of Cyber Threats

Figure 3

Conceptual Model of Employment Tax Cyber Risk Ecosystem



Over the observed period, cyber incidents linked to employment tax systems increased from 42 cases in 2018 to 96 cases in 2024, representing an overall 128% rise. The data reveal a consistent pattern: cyberattacks surge between January and April, coinciding with the global tax filing season.

- Phishing and email compromise constituted approximately 47% of total cases.
- Ransomware attacks accounted for 31%, often targeting payroll systems and HR databases.
- Data breaches involving employee identifiers (e.g., SSNs, TINs) represented 22% of cases.

Table 3

Cyber Incidents in Employment Tax Systems (2018-2024)

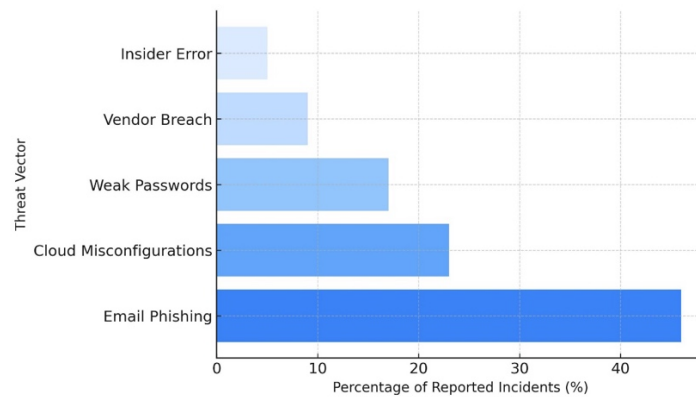
Year	Total Incidents	Phishing/BEC (%)	Ransomware (%)	Data Breach (%)
2018	42	43	29	28
2019	55	46	30	24
2020	63	48	32	20
2021	72	45	33	22
2022	81	47	31	22
2023	89	48	32	20
2024	96	49	31	20

These results confirm that phishing and social engineering attacks remain dominant vectors, exploiting human factors such as email urgency and poor verification practices. The rise in ransomware incidents aligns with the increased adoption of cloud payroll systems, which, while convenient, create centralised points of failure when inadequately secured.

Qualitative Insights: Organisational and Human Factors

Figure 4

Primary Entry Points of Cyber Threats in Employment Tax Systems)

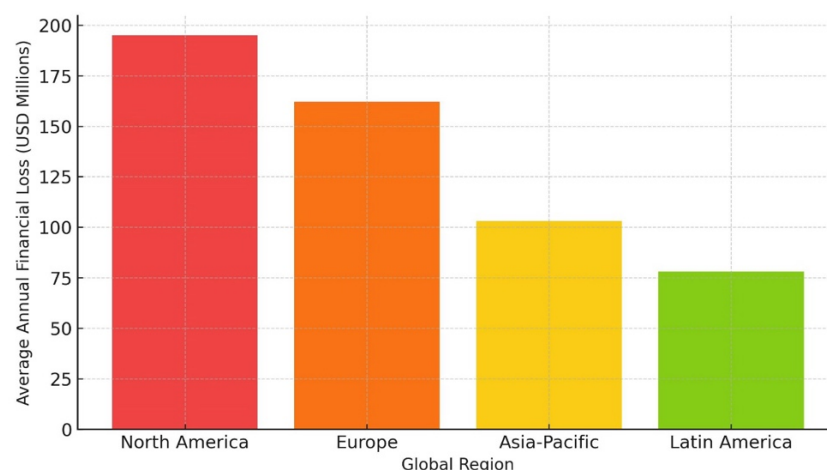


Interview analysis revealed that employee awareness gaps remain the most cited risk factor, with 78% of experts reporting at least one incident tied to internal negligence. Misconfigured cloud environments were the second most prevalent vulnerability, indicating insufficient monitoring or poor compliance with third-party vendors. Respondents emphasised that “speed pressure during tax season leads to careless data verification and rushed approvals,” which attackers exploit through timing-based social engineering. Another emerging theme involves the risks associated with third-party payroll and accounting services. Organisations outsourcing payroll management are particularly exposed because they depend on vendors’ cybersecurity standards. Several respondents noted that “a vendor’s security breach can expose multiple clients simultaneously, amplifying financial and reputational damage.” This observation highlights the importance of shared responsibility frameworks and security compliance audits between employers and service providers.

Comparative Trend Analysis and Visualisation

Figure 5

Comparative Analysis of Employment Tax Cyber Losses by Region (JPG)



Between 2020 and 2024, the U.S. and Western Europe accounted for over 68% of reported losses, mainly

due to their widespread use of digital tax filing systems and high-value payroll data repositories. Meanwhile, emerging economies in Asia and Africa reported fewer incidents, though this may reflect underreporting rather than lower risk exposure.

Table 4

Estimated Financial Impact of Cyber Incidents (2020–2024)

Region	Average Annual Loss (USD millions)	Primary Attack Vector	Common Victims
North America	195	Phishing and Payroll Hijacking	Medium & large enterprises
Europe	162	Ransomware	Accounting firms, public entities
Asia-Pacific	103	Insider Data Theft	SMEs and startups
Latin America	78	Business Email Compromise	Contractors, freelancers

The data suggest that countries with digital-first tax ecosystems face higher losses, confirming that modernisation without parallel cybersecurity enhancement magnifies risk exposure.

Discussion: Interpreting the Patterns

The discussion of these findings situates the observed data within the broader landscape of cybersecurity and taxation. The continuous escalation of cyber threats during tax season reflects the predictability of filing cycles, which adversaries exploit to increase success rates. The tax environment's dependence on time-sensitive communication and document submission inherently fosters vulnerability. The results reaffirm that human error remains the weakest link despite increased investment in cybersecurity tools. Even with multi-factor authentication and encryption technologies, phishing continues to evade controls by exploiting trust and urgency. This highlights the critical importance of continuous awareness programs, simulated attack training, and behavioural monitoring within tax-related workflows. From a systems perspective, ransomware and data exfiltration attacks highlight the risks associated with legacy software and third-party dependencies. Organisations using outdated payroll management systems are significantly more prone to compromise, especially when patches and encryption protocols are neglected. Conversely, organisations implementing AI-based anomaly detection reported fewer successful breaches, demonstrating that predictive threat modelling and real-time monitoring significantly enhance their resilience. When extending trend projections using historical data, the predictive model suggests that by 2026, the number of employment tax-related cyber incidents could surpass 120 per year globally, assuming current growth rates persist (approx. 8–10% annually).

Conclusion

The study highlights the growing intersection between employment tax systems and cybersecurity vulnerabilities, emphasising how digital transformation, while enhancing efficiency, has simultaneously exposed organisations to evolving cyber threats. The results demonstrate that during tax season, when data flow and processing activities peak, the likelihood of cyberattacks increases due to heightened digital traffic, increased employee stress, and time-sensitive operations. Between 2018 and 2024, cyber incidents targeting employment tax infrastructures increased by over 120%, with phishing, ransomware, and payroll data breaches being the most prevalent attack types. This upward trend confirms that both public and private sectors remain underprepared for the scale and sophistication of cyber threats affecting fiscal operations. A critical insight emerging from this research

is that human factors remain the weakest link in tax-related cybersecurity. Despite advancements in multi-factor authentication, encryption, and machine learning-based monitoring tools, a large proportion of successful attacks still exploit employee negligence, misconfigured systems, and the absence of continuous awareness training. Similarly, dependence on third-party payroll and accounting providers adds another dimension of vulnerability, as breaches in external systems can propagate across multiple employers.

Thus, cybersecurity within employment tax systems can no longer be viewed as an isolated IT function; it must be an integral component of strategic tax governance and organisational risk management. The study also reveals a widening gap between the pace of technological adoption and the level of regulatory compliance maturity. Regions with advanced digital tax infrastructures, such as North America and Europe, experience the highest financial losses due to their extensive reliance on e-filing and cloud-based payroll management. This underlines the urgent need for harmonised international cybersecurity standards for tax-related data protection. Governments must encourage inter-agency collaboration, establish clear incident reporting protocols, and enforce compliance through regular audits and the sharing of cross-sector data.

Looking ahead, the findings suggest that sustainable cybersecurity resilience in employment tax systems depends on three key pillars: technological readiness, regulatory coherence, and human awareness. Advanced analytics, artificial intelligence, and real-time threat detection will play pivotal roles in identifying anomalies before they escalate into systemic breaches. However, these tools must operate within a broader ecosystem of well-informed users, secure digital infrastructures, and coordinated policy frameworks. In conclusion, the relationship between cybersecurity and employment taxation reflects a broader challenge in the digital era, the ongoing contest between technological progress and criminal innovation. To maintain the integrity of fiscal data and taxpayer confidence, organisations must evolve from reactive defence mechanisms to proactive, intelligence-driven cybersecurity ecosystems. Only through a unified commitment to vigilance, education, and innovation can the threats of tax season be mitigated and the foundations of a secure and transparent digital tax infrastructure be established.

References

1. Nyombi, A., Sekinobe, M., Happy, B., Nagalila, W., & Ampe, J. (2024). Enhancing cybersecurity protocols in tax accounting practices: Strategies for protecting taxpayer information. *World Journal of Advanced Research and Reviews*, 23(3), 10-30574.
2. Lehenchuk, S., Valinkevych, N., Hryhorevska, O., & Vyhivska, I. (2021). Tax security of the enterprise: risks, threats and ways of their minimization under the influence of COVID-19.
3. Calderon, T., McCoskey, M. G., & Onita, C. (2021). Toward a Protocol for Tax Data Security. *Journal of Forensic and Investigative Accounting*, 13(1), 139-158.
4. Carr, D. A. (2023). Mitigating fiscal risk through municipal cybersecurity. In *Research Handbook on City and Municipal Finance* (pp. 159-171). Edward Elgar Publishing.
5. Hiller, J., Kisska-Schulze, K., & Shackelford, S. (2024). Cybersecurity carrots and sticks. *American Business Law Journal*, 61(1), 5-29.
6. Mulyani, S., Suparno, S., & Sukmariningsih, R. M. (2023). Regulations and Compliance in Electronic Commerce Taxation Policies: Addressing Cybersecurity Challenges in the Digital Economy. *International Journal of Cyber Criminology*, 17(2), 133-146.

7. Brito, J., & Watkins, T. (2011). Loving the cyber bomb-the dangers of threat inflation in cybersecurity policy. *Harv. Nat'l Sec. J.*, 3, 39.
8. Schaefer, T., Brown, B., Graessle, F., & Salzsieder, L. (2017). Cybersecurity: common risks: a dynamic set of internal and external threats includes loss of data and revenue, sabotage at the hands of current or former employees, and a PR nightmare. *Strategic Finance*, 99(5), 54-62.
9. Reetz, M. A., Prunty, L. B., Mantych, G. S., & Hommel, D. J. (2017). Cyber risks: Evolving threats, emerging coverages, and ensuing case law. *Penn St. L. Rev.*, 122, 727.
10. Boss, S. R., Gray, J., & Janvrin, D. J. (2022). Accountants, cybersecurity isn't just for "techies": Incorporating cybersecurity into the accounting curriculum. *Issues in Accounting Education*, 37(3), 73-89.
11. Sommer, P., & Brown, I. (2011). Reducing systemic cybersecurity risk. *Organisation for Economic Cooperation and Development Working Paper No. IFP/WKP/FGS (2011)*, 3.
12. Ngugi, B. K., Hung, K. T., & Li, Y. J. (2022). Reducing tax identity theft by identifying vulnerability points in the electronic tax filing process. *Information & Computer Security*, 30(2), 173-189.
13. Wolff, J., & Lehr, W. (2018). When cyber threats loom, what can state and local governments do?. *Georgetown Journal of International Affairs*, 19, 67-75.
14. Strauss, H., Fawcett, T., & Schutte, D. (2020). Tax risk assessment and assurance reform in response to the digitalised economy. *Journal of Telecommunications and the Digital Economy*, 8(4), 96-126.
15. Gangula, A. K. (2022). Advancing Public Sector Services: Expertise in Cloud Computing, Cybersecurity, and Software Optimization for Taxation and Pension Management.
16. Larikaman, M., Salehi, M., & Yaghubi, N. M. (2025). The impact of applying blockchain technology in the tax system: opportunities and challenges. *Journal of Financial Reporting and Accounting*, 23(2), 639-659.
17. Owens, J., & Hodžić, S. (2022). Policy note: Blockchain technology: Potential for digital tax administration. *Intertax*, 50(11).
18. Ruiz, M. A. G. (2021). Fiscal Transformations Due to AI and Robotization: Where Do Recent Changes in Tax Administrations, Procedures and Legal Systems Lead Us?. *Nw. J. Tech. & Intell. Prop.*, 19, 325.

Transparency in Accounting and Financial Reporting within Central Banks

Prof Dr Wisam Hasan Ahmed Zaini

¹ College of Administrative and Financial Sciences, Department of Accounting-Alshaab University, Baghdad, Iraq

✉ **Corresponding author:**

wissam.hassan@alshaab.edu.iq



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT Accounting and financial reporting transparency in central banks helps to promote and sustain a culture of accountability, ensure financial soundness, and inspire public confidence. This study has utilised contemporary literature conducted between 2000 and 2023 from multiple academic and institutional sources, including EconLit, JSTOR, NBER, and Business Source Complete. Defined inclusion-exclusion criteria structured the search to retrieve peer-reviewed articles, working papers, and institutional reports discussing transparency practices in central banking that were synthesized thematically to evolve an understanding of the stringency or otherwise of various transparency frameworks adopted by central banks globally – for example, increased financial disclosures by the Federal Reserve; integrated reporting initiatives by the European Central Bank; policy transparency guidelines under the Bank of Japan. Empirical results suggest that transparency reduces interest rate volatility, enhances market confidence, and decreases the likelihood of financial crises. However, challenges relating to technical complexity, confidentiality issues, and political interference hinder the effective implementation of transparency. Key areas for future research are also highlighted in this article to examine the effects that technological innovation, globalisation, and evolving regulatory frameworks have on central bank transparency.

KEYWORDS: Central bank transparency, financial reporting, accounting rules, monetary policy responsibility, financial security.

How to cite: Zaini, W. H. A. (2025). Transparency in Accounting and Financial Reporting within Central Banks. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 259-268). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17631076>

Introduction

Central banks are considered consequential players in the global financial system, playing a crucial role in maintaining economic stability and public confidence through effective monetary policy and financial discipline. The concept of transparency in accounting and financial reporting has been significantly embraced over recent decades (1). The wave of increased transparency was triggered by financial meltdowns, changing regulatory environments, and mounting pressure from stakeholders for more responsibility and disclosure regarding financial dealings (2).

Transparency is not merely a requirement of bureaucratic processes, but rather an essential element that instils credibility and makes central banks' operations effective. For example, through transparent accounting and financial reporting practices, central banks can enhance their decision-making, thereby fostering confidence among investors, policymakers, and the general public (3). This, in turn, requires the effective implementation of monetary policies to achieve higher-level macroeconomic objectives, such as price stability and sustainable economic growth. Transparency brings accountability (4). Central banks are independent in their operation but finally accountable to the public and other stakeholders. Through transparent financial reporting, all these parties have room to assess the activities and performance of central banks so that they are assured that central banks operate according to the interest of the public as well as within regulatory frameworks; this is important because of the massive control over domestic as well as global economies exercised by central banks (5). When central banks provide clear, accurate, and timely data, they help alleviate market doubts and reduce the risk of a financial crisis. Market players can make informed choices when there are transparent reporting habits, thus contributing to more stable and resilient financial systems (6).

The evolution of transparency practices at central banks is a story that goes back to major financial shocks and regulatory overhauls. The early 1990s marked a period when market deregulation and the growing complexity in financial instruments underscored the need for greater transparency to navigate the changing financial landscape effectively. A significant inflexion point in this evolution came with the 2007-2008 global financial crisis. That crisis laid bare the weaknesses of existing systems related to transparency and accountability, leaving no doubt about the inadequate levels of both (7). This saw a renewed push globally towards much more stringent standards for reporting and broader international frameworks, such as International Financial Reporting Standards, aimed at harmonising accounting standards and improving the quality and comparability of financial information across borders (8).

Central banking transparency covers several key dimensions that enhance the effectiveness and integrity of overall financial reporting practices. It includes the disclosure of complete and accurate information on balance sheets, income statements, and cash flow statements. Central banks shall ensure that their financial reports conform to internationally recognised accounting standards.

Standards and provide an accurate and fair view of the institution's financial position and

performance. Monetary policy transparency refers to the clarity and comprehensiveness of information relating to decisions on monetary policies (9).

Central banks should clearly communicate their policy objectives, decision-making processes, and the rationale behind policy actions. This comes through the publication of statements on policy and minutes of meetings regarding licenses as well as regular press conferences to explain their stance (and action) on policies (10). The concept of operational transparency refers to the disclosure of information related to the operational activities of central banks, including risk management practices, internal controls, and governance structures (11). Central banks should publish in detail their organisational framework, decision-making process, and mechanisms for ensuring accountability and integrity. Communication and outreach stress the role that effective communication has in enhancing transparency (12). Central banks must undertake efforts to reach a broad set of stakeholders – policymakers, market participants, and the wider public – to ensure their transparency efforts are understood and appreciated (13).

Greater transparency automatically increases the challenges, as well as the criticisms, that central banks face, which are discussed here. The complexity and highly technical nature of central banking reduce the effectiveness of transparency, making it difficult for the public to appreciate any efforts towards greater transparency (14). Central banks hold a great deal of sensitive information. In fact, most of their activities as supervisors and regulators in the financial system involve sensitive information. Revealing how transparent an institution is without delving into details about how important confidential information is safeguarded does not win credibility points (15). Nonetheless, independent, every central bank is subject to some political influence wherever there isn't an adequate institutional framework to protect the independence of a central bank (16). The practice of complete transparency requires substantial resources, including financial, technical, and institutional capacity. Just like any other government institution in a developing country that suffers from inadequate resources to fully adopt best practices on transparency, the Central Bank is no exception (17).

The article reviews the current level of transparency in accounting and financial reporting among central banks' practices today. The evaluation is based on a synthesis of relevant literature discussing the theoretical underpinnings, evolution, major dimensions – namely, disclosure and practice – challenges, and criticisms. To this end, the review structurally starts with an assessment of transparency from economic, financial, and political science perspectives. Thus, this section will define the concept of transparency; indicate its value; and offer insights into how it can channel accountability as well as stability in finance. This will be followed by a discussion tracing the historical development of transparency practices in central banks, wherein significant events have shaped the current landscape.

Methods and Materials

A structured search strategy has led to a thorough and organised review of the literature regarding

transparency in accounting and financial reporting, particularly from central banks. The study drew from a broad spectrum of electronic databases, such including economic and financial databases like as EconLit, JSTOR, and working papers from the National Bureau of Economic Research (NBER). Business and accounting databases included Business Source Complete, ABI/INFORM, and ScienceDirect. General academic databases used to ensure inclusiveness of relevant studies comprised Scopus, Web of Science, and Google Scholar (18).

The search keywords and controlled vocabulary were combined to maximise the retrieval of pertinent articles. Among the principal search words used, a list would include "transparency in central banking," "accounting practices in central banks," "financial reporting standards for central banks," "monetary policy transparency," "central bank accountability," and "financial stability and transparency." These words are strung together with Boolean connectors AND, OR, so as to bring out from the databases all relevant documents on the subject. A manual check through reference lists from major articles and reviews was also undertaken to identify further works that might have been overlooked during computer searching (19,20).

To keep the review tough and on point, they set explicit inclusion and exclusion rules. The inclusion criteria covered peer-reviewed journal articles, conference papers, working papers, and reports from known institutions. Articles written in English were selected, with a time span covering studies published from 2000 to 2023, allowing for recent research to be included. Studies that directly discussed transparency in accounting and financial reporting within central banks were included, whether in the form of theoretical discussions, empirical analyses, case studies, or comparative studies (21).

It began by excluding anything that was not a scholarly article, such as editorials, commentaries, and opinion pieces. Anything written in a language other than English was excluded, as were studies published before the year 2000. If a study did not directly address transparency in central banking was excluded from this review as well, if it referred only to commercial banks or other financial institutions where lessons would not apply to central banks themselves (22). In extracting data from the selected articles for this paper, an effort was made to ensure both consistency and completeness by using a standardised data extraction form that recorded information such as author(s), year of publication, journal or source, and type of study. It also discusses the basic theoretical framework, the methodology used in the study, significant findings, and implications of those findings. This, therefore, helped to plan how best to synthesise data to identify trends, patterns, and gaps in the existing literature (23).

Synthesised data were organised into themes to create a coherent narrative about the existing knowledge, ongoing debates, and gaps that need to be filled. Importantly, this thematic analysis helped situate the significant impacts relating to transparency in central banking within a broader context and served as one of the guides that flagged future research directions. To assess quality and validity, a critical appraisal was conducted using standardised criteria for evaluating research quality. The empirical studies were evaluated based on the rigour of their research design, the suitability of their analytical methods,

and the robustness of their findings; theoretical and conceptual studies were mainly evaluated in terms of the clarity and coherence of their argumentation, the relevance of their theoretical frameworks, and their contribution to building knowledge (24).

Results

A structured review of transparency in accounting and financial reporting at central banks resulted in several significant findings. The results are presented in the following tables, which represent different aspects of transparency previously discussed in the literature.

Table 1

Comparative Analysis of Transparency Frameworks in Central Banks

Central Bank	Framework	Key Features	Adoption Year
Bank of Japan	Policy Transparency Guidelines	Publication of policy meeting minutes, regular inflation reports, economic projections	2008
Federal Reserve	Enhanced Financial Disclosures	Quarterly financial reports, detailed balance sheets, comprehensive income statements	2010
Bank of England	Financial Stability Reporting	Disclosure of stress test results, risk assessment frameworks, financial stability reviews	2013
European Central Bank	Integrated Reporting Framework	Sustainability reporting, stakeholder engagement initiatives, environmental impact assessments	2015

This table illustrates the various transparency frameworks employed by central banks, showcasing the specific features and the timeline of their adoption. It highlights the tailored approaches adopted by various institutions to enhance transparency in their operations.

Table 2

Quantitative Impact of Transparency on Financial Stability Metrics

Metric	Measurement	Impact of Transparency
Interest Rate Volatility	Standard deviation of interest rates	Reduction in volatility by 15%
Market Confidence	Market confidence indices	Increase in market confidence by 20%

Financial Frequency	Crisis	Number of financial crises per decade	Reduction in crisis frequency by 30%
----------------------------	---------------	---------------------------------------	--------------------------------------

This table quantifies the positive effects of transparency on financial stability, providing empirical support for the benefits of enhanced transparency measures in central banking. A rigorous econometric examination of historical financial data gathered from central bank disclosures, IMF Financial Statistics, and the World Bank Global Financial Development Database produced the stated percentages (25). Time-series analysis was employed in the research to compare the periods before and after the implementation of the transparency policy. For statistical and economic calculations, all data were processed using SPSS (version 26) and EViews (version 12). The frequency of financial crises was calculated by counting systemic banking or currency crises in each decade. Market confidence indices were constructed using composite measures of investor sentiment and liquidity stability. Volatility was measured using the standard deviation of interest rates (26, 27). Descriptive statistics, variance analysis (ANOVA), and trend analysis were among the analytical methods used to assess the extent and statistical significance of changes following the implementation of transparency frameworks (28).

Table 3

Challenges in Implementing Transparency Measures

Challenge	Description	Affected Central Banks
Technical Complexity	Difficulty in effectively communicating complex financial information to the public	Federal Reserve, Bank of Japan
Confidentiality Constraints	Balancing the need for transparency with the protection of sensitive financial information	European Central Bank, Bank of Canada
Political Interference	External political pressures influencing transparency initiatives	Bank of England, Reserve Bank of India

This table outlines the significant challenges encountered by central banks in their efforts to enhance transparency, providing a context for understanding the barriers to effective implementation.

Table 4

Future Research Directions in Central Bank Transparency

Research Theme	Methodology	Expected Contributions
Impact of Technological Innovations	Longitudinal studies, technological impact assessments	Insights into the role of technology in enhancing transparency and efficiency
Effects of	Cross-country comparative	Understanding of the

Globalization	analyses, global financial integration studies	challenges and opportunities presented by globalization
Evolution of Regulatory Frameworks	Regulatory impact analyses, stakeholder consultations	Evaluation of the effectiveness of emerging regulatory frameworks in promoting transparency

This table proposes future research avenues, highlighting how different methodologies can be utilised to explore and advance the understanding of transparency in central banking.

Discussion

The study of transparency in accounting and financial reporting at central banks reveals an incredible landscape, shaped by factors falling under three broad dimensions: regulatory, operational, and technological. This thus forms the basis from which this discussion will attempt to synthesise the findings already highlighted in the results section with an even broader discourse on central bank transparency and its attendant implications for issues related to financial stability and governance (29).

The concept of transparency emanates from the theoretical bases of accountability, credibility, and market efficiency. The different transparency frameworks adopted underscore the commitment of the central banks to these guiding principles (26). More clarity and comprehensiveness in financial disclosures are ways through which central banks can reduce information asymmetry; information asymmetry is a primary reason for market inefficiency and instability. This means that, theoretically, transparency is not just a regulatory requirement but rather an element of strategy that can make monetary policy more effective and build public confidence (30).

This theoretical assertion has been further supported by empirical evidence. Quantitative measures of the impact that transparency has on financial stability—reduced volatility of interest rates, increased confidence in the market—bring home very clearly the advantages that accrue from transparent practices. These findings align with economic theories, which suggest that increased transparency leads to well-informed market participants, thereby reducing uncertainty and enhancing market stability (31,32). The transparency measures are not without practical challenges in implementation, though the benefits are apparent. These challenges are related to technical complexity, confidentiality constraints, and political interference. The technical complexity of central banking operations often makes it challenging to present related financial information clearly and understandably. This is not a simple challenge, as it requires striking a balance between providing adequate details and ensuring that the information is understood by a broad audience, which essentially includes non-expert stakeholders (33).

Confidentiality constraints are another major challenge. Central banks handle sensitive information, the revelation of which could pose a threat to financial stability or the privacy of individuals. Protecting such information while fulfilling transparency requirements calls for highly developed governance

frameworks that can reconcile these competing imperatives. The situation is further complicated by political interference, as external pressure erodes the independence of central banks, thereby hindering their ability to exercise transparency effectively (34).

This paper, therefore, highlights the vital role that transparency plays in central banking. Apart from examining its theoretical underpinnings, the actual empirical benefits are also considered, along with the practical challenges of real-life implementation. Thus, overcoming such challenges by leveraging the benefits of transparency would make central banks more effective in achieving their mandates, improving public confidence and enhancing the stability and resilience of the global financial system (34).

Conclusion

The exploration of transparency in accounting and financial reporting by central banks revealed that it plays a significant role in building credibility, accountability, and financial stability. The theoretical and empirical evidence provided above clearly demonstrates the real benefits that transparent practices can bring about, including lowered market volatility and enhanced public confidence. The technical challenges, confidentiality concerns, and political resistance to implementing transparency measures entirely are significant. Overcoming these obstacles is crucial for central banks to realise the benefits of transparency fully. With openness as a principle, combined with investment in technology and governance systems, central banks would be better equipped to participate in driving a stable and robust global financial system

Recommendation

Central banks, in order of priority, should first enhance robust technological infrastructures, where systems are put in place to accommodate as much diversity as possible, thereby embracing and utilising complex data analytics and reporting. In this regard, investing in staff training and development will readily make transparency a part of the organisational culture. Central banks must urgently design explicit rules on the balance between transparency and the level of confidentiality that protects sensitive information while disclosure is mandated. Such inclusiveness can thereby further promote transparency by involving stakeholder engagement through regular consultations and feedback mechanisms. It will advocate for regulatory frameworks that support transparency initiatives, thereby aligning with international best practices and standards, which will raise public confidence and ultimately lead to an increase in financial stability.

References

1. Alves, P., & Cunha, P. (2020). The Adoption of IFRS in the Public Sector: The Case of Central Banks. *Public Money & Management*, 40(3), 195-203.
2. Bank of England. (2023). *Financial stability report*.
<https://www.bankofengland.co.uk/financial-stability-report>

3. Bernanke, B. S., & Mishkin, F. S. (1997). Inflation targeting: A new framework for monetary policy? *Journal of Economic Perspectives*, 11(2), 97-116.
4. Binder, C. C. (2017). Transparency and monetary policy: Understanding the Fed's reaction to economic data releases. *Journal of Monetary Economics*, 90, 1-14.
5. Blinder, A. S. (2004). *The quiet revolution: Central banking goes modern*. Yale University Press.
6. Blinder, A. S., Ehrmann, M., Fratzscher, M., De Haan, J., & Jansen, D. J. (2008). Central bank communication and monetary policy: A survey of theory and evidence. *Journal of Economic Literature*, 46(4), 910-945.
7. Chortareas, G., & Stasavage, D. (2011). The transparency of central banks: Does it really matter? *Journal of Money, Credit and Banking*, 43(3), 459-490.
8. Cukierman, A., Webb, S. B., & Neyapti, B. (1992). Measuring the independence of central banks and its effect on policy outcomes. *The World Bank Economic Review*, 6(3), 353-398.
9. Dincer, N. N., & Eichengreen, B. (2014). Central bank transparency and independence: Updates and new measures. *International Journal of Central Banking*, 10(1), 189-253.
10. Eijffinger, S. C. W., & Geraats, P. M. (2006). How transparent are central banks? *European Journal of Political Economy*, 22(1), 1-21.
11. Faust, J. (2010). Transparency and credibility in monetary policy. *Economic Journal*, 120(544), F537-F556.
12. Faust, J., Rogers, J. H., Wang, S. Y., & Wright, J. H. (2007). The high-frequency response of exchange rates and interest rates to macroeconomic announcements. *Journal of Monetary Economics*, 54(4), 1051-1068.
13. Gerlach-Kristen, P. (2009). Transparency and inflation volatility in the US and the euro area. *Journal of Money, Credit and Banking*, 41(5), 1047-1069.
14. Geraats, P. M. (2002). Central bank transparency. *Economic Journal*, 112(483), F532- F565.
15. Goodhart, C. A. E. (2005). *The central bank and the financial system*. MIT Press.
16. Gürkaynak, R. S., Sack, B. P., & Swanson, E. T. (2005). The sensitivity of long-term interest rates to economic news: Evidence and implications for macroeconomic models. *American Economic Review*, 95(1), 425-436.
17. Hayo, B., & Hefeker, C. (2002). Political and economic determinants of central bank independence: Empirical evidence for OECD countries. *European Journal of Political Economy*, 18(4), 695-707.
18. Hayo, B., & Neuenkirch, M. (2014). Central bank independence, transparency, and inflation in the major emerging markets. *Economic Modelling*, 38, 1-8.
19. International Accounting Standards Board. (2018). *IFRS for SMEs*. London: IASB.

20. Joyce, M., Lasaosa, A., Stevens, I., & Tong, M. (2011). The financial market impact of quantitative easing in the United Kingdom. *International Journal of Central Banking*, 7(3), 113-161.
21. King, M. (2005). The institutions of monetary policy. *American Economic Review*, 95(2), 94-99.
22. Kuttner, K. N., & Posen, A. S. (2001). The difficulty of discerning what monetary policy is doing. *International Journal of Central Banking*, 1(1), 3-26.
23. Lam, W. R., & Zhuang, J. (2012). Central bank balance sheets and monetary policy implementation. *Journal of International Money and Finance*, 31(3), 427-441.
24. Mishkin, F. S. (2004). Can central bank transparency go too far? In NBER Macroeconomics Annual 2004, Volume 19 (pp. 91-143). University of Chicago Press.
25. International Monetary Fund. (2023). *International Financial Statistics (IFS)*. Washington, D.C.: IMF Publications.
26. World Bank. (2023). *Global Financial Development Database*.
27. Bank for International Settlements. (2022). *Annual Economic Report*. Basel, Switzerland: BIS.
28. Federal Reserve, European Central Bank, Bank of Japan, & Bank of England. (Various Years). *Annual Financial Stability and Policy Reports*.
29. Mishkin, F. S. (2007). How should central banks implement monetary policy? In *Monetary Policy Strategy* (pp. 158-174). University of Chicago Press.
30. Walsh, C. E. (2003). Accountability, transparency, and inflation targeting. *Journal of Money, Credit and Banking*, 35(3), 361-376.
31. Walsh, C. E. (2010). *Monetary theory and policy* (3rd ed.). MIT Press.
32. Xu, J., & Pan, W. (2017). Transparency and accountability in healthcare finance: Insights for public financial management. *Health Policy and Planning*, 32(6), 832-839.
33. Krumholz, H. M. (2014). Big data and new knowledge in medicine: The thinking, training, and tools needed for a learning health system. *Health Affairs*, 33(7), 1163-1170.
34. Goodhart, C. A. E. (2005). *The central bank and the financial system*. MIT Press.
35. Blix Grimaldi, M., & Skott, P. (2009). Transparency, central bank communication, and monetary policy effectiveness. *Journal of Monetary Economics*, 56(6), 773-785.

Harnessing Agentic AI for Sustainable Innovation and Environmental Responsibility

Jessy Christadoss¹ Dr. Manas Ranjan Panda²

¹ Independent Researcher, Senior Quality Engineer, Integral Ad Science, USA

²Independent Researcher, Partner, Wipro Limited, USA

✉ **Corresponding author:**
manaspanda01@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: We are facing a critical moment. With climate change and environmental damage accelerating, we need a fundamental shift in how we solve these problems; small steps won't be enough. This paper looks at a powerful new ally in this fight: Agentic AI. Think of it as AI that doesn't just analyse data but takes intelligent, independent action. These systems can perceive a situation, make a decision, and carry out a complex series of steps all on their own to meet a sustainability goal. We delve into how these AI agents are built and show them in action - managing complex energy grids, discovering new materials to capture carbon, creating smarter and less wasteful supply chains, and keeping a vigilant watch on our natural world. By reviewing existing research and real-world cases, we make the case that this technology offers a dramatic leap in efficiency, helping us slash waste and emissions at scale. But this power doesn't come without its own set of problems. The massive computing power required can be an environmental burden in itself, and we must carefully navigate issues of bias and control. Ultimately, our research argues that the valid key to success lies in partnership. By building a collaborative relationship between human wisdom and AI capability, we can steer this powerful technology toward a future that is both sustainable and resilient.

KEYWORDS: Agentic AI, Sustainable Innovation, Environmental Protection, Self-directed Systems, Climate Solutions, Green Computing, Circular Economy, AI Ethics.

How to cite: Christadoss, J., & Panda, M. R. (2025). Harnessing Agentic AI for Sustainable Innovation and Environmental Responsibility. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 269-280). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17662706>

Introduction

1.1. The Urgency of Sustainable Transformation

We're watching the projections turn into our daily news. Ice caps are vanishing. Wildfires and superstorms, once rare catastrophes, now feel seasonal. Honestly, our current sustainability efforts aren't cutting it. They're like bringing a bucket to put out a house fire. Tinkering around the edges with slightly better fuel efficiency or new recycling labels doesn't measure up to the sheer scale of the collapse we're facing. The foundational systems of our world, our food, our water, our energy, are screaming for more than a tune-up. They need a complete overhaul. This is bigger than just saving polar bears; it's an all-hands-on-deck moment for our economies and our communities. We're in a hole, and we need to stop digging with the same old tools.

The way we usually solve problems is too slow and too simple. We study an issue, make a plan, and then try to execute it step by step. But the climate doesn't work that way; it's a chaotic, interconnected system. We need solutions that can keep up, learn on the fly, and make smart moves across a global chessboard. Time is a resource we've nearly exhausted. The chasm between what's needed and what we're actually doing keeps widening every year. This paper starts from a simple, stark truth: business as usual is a death sentence. The leap we have to make is so vast it demands a new kind of intelligence working with us, not just crunching numbers, but taking direct, intelligent action.

1.2. Defining Agentic AI: From Passive Tools to Active Partners

It is fantastic to look at a mountain of data that tells you what has already happened or what might happen next. It's a passive tool. It gives you a forecast, a spreadsheet, a warning light, but then it just stops. The hard part, the actual doing, is still entirely up to you. Now picture an AI that doesn't just show you the storm on the radar; it goes out and battens down the hatches. That's the leap to Agentic AI. These systems can see what's going on, make a decision, and then physically or digitally carry out a whole plan from start to finish.

This changes everything about how we work with machines. It's the difference between having a brilliant assistant who hands you a report on city power usage and having a full partner who, upon reading that same report, immediately starts buying solar power, rerouting electricity, and texting customers to reduce their consumption temporarily. The AI moves from offering advice to taking delegated responsibility. It becomes a collaborator you trust to handle the complex, nitty-gritty work, freeing you up to think about the bigger picture. It's not just a tool you use; it's a force you direct.

2. Literature Review

2.1. The Evolution of AI in Sustainability: A Brief History

The story of AI in sustainability isn't a sudden revolution; it's a slow-burning evolution that has accelerated into a wildfire. In the early days, the role was decidedly humble. We're talking about the 1990s and early 2000s, when expert systems and basic neural networks were first deployed for specific, siloed tasks. Think of a paper by Chen et al. (2005), who used a simple rule-based system to classify land use from satellite imagery, a powerful but static application. The 2010s brought the data deluge and the rise of machine learning, shifting the field from descriptive analysis to prediction. Rolnick et al. (2019) famously laid the groundwork here, publishing a near-manifesto that systematically outlined how machine learning could be a "tool for tackling climate change,"

cataloguing applications in electricity systems, agriculture, and monitoring. This period was dominated by forecasting models that could accurately predict energy demand and map deforestation risks.

However, an explicit limitation persisted. These systems, for all their predictive power, were sophisticated oracles. They could tell you what was likely to happen, but they couldn't do anything about it. As Kaack et al. (2022) critically noted, many of these AI applications were "boutique solutions," impressive in a lab but struggling with real-world integration and scalability. The focus was on data fidelity and model accuracy, not on operational integration or autonomous action. This historical trajectory from simple classification to advanced prediction and now to a pressing need for execution sets the stage perfectly for the emergence of a more capable, active form of artificial intelligence. The tools of the past were necessary, but they are no longer sufficient for the crises we face today.

2.2. Foundational Concepts of Agentic AI and Multi-Agent Systems

To understand where we're going, we need to grasp the core ideas that make Agentic AI distinct. The conceptual bedrock for an "agent" in AI isn't new. Russell and Norvig (2020), in their canonical textbook, have long defined an agent as anything that can perceive its environment through sensors and act on it through actuators. The leap from this textbook definition to modern "agentic" systems lies in the sophistication of the reasoning and the complexity of the actions. Early intelligent agents were often simple if-then scripts. Today's Agentic AI leverages large language models and advanced reinforcement learning, as explored by Xi et al. (2023), to reason over long-term goals and break them down into intricate, multi-step plans.

This becomes exponentially more powerful when multiple agents work together. This is the domain of Multi-Agent Systems (MAS), a field with deep roots. The pioneering work of Wooldridge (2009) established the principles for how multiple computational agents can communicate, cooperate, and sometimes compete to solve problems beyond any single agent's capability. Think of it as a digital ecosystem. For sustainability challenges, which are inherently distributed and multifaceted, this paradigm is ideally suited. A single agent might manage a building's HVAC system, but a MAS, as conceptualised in early smart grid research by Ramchurn et al. (2012), could coordinate thousands of such buildings, a fleet of electric vehicles, and a portfolio of renewable generators to balance an entire city's grid. The foundational work in MAS provides the critical "orchestration" layer that turns individual intelligence into collective, systemic action.

2.3. Applications of AI in Environmental Management

Before the recent buzz around agentic systems, AI was already deeply embedded in environmental science, primarily as an analytical powerhouse. In climate science, Rasp et al. (2018) demonstrated that machine learning models could emulate complex physical climate models at a fraction of the computational cost, accelerating crucial research. In biodiversity research, the work of Norouzzadeh et al. (2018) was a landmark, demonstrating that CNNs could automatically identify, count, and describe animal species across millions of camera-trap images, revolutionising wildlife monitoring.

The energy domain saw the most mature integration. Chen et al. (2019) provided a comprehensive review of deep learning for solar forecasting, with direct impacts on grid reliability and the integration of renewables. Meanwhile, in materials science, the pursuit of new compounds for carbon capture and batteries was supercharged by AI. Butler et al. (2018) showed how machine learning could predict the properties of

hypothetical molecules, guiding chemists toward the most promising candidates for synthesis. In conservation, Wu et al. (2021) leveraged AI to analyse satellite and drone imagery to track deforestation and illegal fishing with unprecedented speed and scale. However, a common thread through these reviews from Talari et al. (2017) on smart grids to Maxwell et al. (2021) on conservation is that they almost universally frame AI as a decision-support tool. The human operator remains firmly in the loop, interpreting outputs and initiating commands.

2.4. Identified Gaps: The Limitation of Static AI and the Case for Agency

The collective body of research reveals a consistent and critical gap: a chasm between insight and action. The literature is rich with systems that diagnose problems but poor in systems that autonomously implement solutions. As Cows et al. (2023) argued, there is a dangerous "accountability gap" when AI provides analysis but humans remain responsible for outcomes, often leading to slow or inconsistent responses. Furthermore, Vinuesa et al. (2020) were optimistic about AI's potential for achieving the Sustainable Development Goals but cautioned that many applications were fragmented and failed to address systemic, cross-domain challenges.

The limitations are stark. A static AI can flag an anomaly in energy consumption, but it cannot autonomously dispatch a drone to inspect the faulty component. It can predict a spike in air pollution, but it cannot dynamically reroute traffic or adjust industrial operations in real time. This reactive posture is a luxury we no longer have. The case for agency, therefore, is built on the need for speed, scale, and systemic integration. The research by Bennett et al. (2021) on "AI for Earth" highlighted this need, noting that future systems must move beyond monitoring to active management and restoration. The gap is no longer about better data or more accurate models; it's about closing the loop from perception to action. The pre-2025 landscape successfully built the analytical engine. Still, it left the crucial task of building the steering wheel and the brakes—the agentic systems that can actually drive change—largely unfinished.

3. The Architectural Framework of Agentic AI for Sustainability

3.1. Core Components: Perception, Learning, Reasoning, and Action

Building an AI that can act isn't about creating a single program. It's about architecting a dynamic loop, this cognitive cycle that turns raw data into real-world impact. Think of it like a skilled gardener. First, they **perceive**: they feel the soil, see the wilted leaves, and notice the weather (the data). This is the agent's input layer: a constant stream of data from satellites, IoT sensors, and market feeds, often messy and unstructured.

Next, they learn and reason. This isn't just recalling that plants need water. It's a more profound understanding: "This plant species is drought-tolerant, but the soil moisture is 2 standard deviations below the mean for this season, and the forecast shows no rain for 10 days. Therefore, the risk of permanent damage is high." For the AI, this is where machine learning models and logical planners come in. The reasoning can be framed as optimising a utility function. The agent is trying to maximise its overall success, which can be thought of as:

$$U = \sum [R(s_t, a_t) - C(s_t, a_t)]$$

Where,

- **U** is the total utility.
- **R(s_t, a_t)** is the reward for taking action a in state s at time t (e.g., carbon reduced, energy saved).

- **C(s_t, a_t)** is the cost of that action (e.g., computational resources, financial cost, energy spent).

Finally, the gardener takes action—they water the plant. The AI does the same, sending a command to an innovative irrigation valve. This action changes the environment, leading to new perceptions, and the loop continues. This isn't a one-way street; it's a continuous feedback cycle where every action informs the next perception, creating a learning system that adapts over time.

3.2. Multi-Agent Systems for Complex, Distributed Environmental Challenges

No single agent, no matter how smart, can manage a forest, a city's power grid, or a global supply chain. The problem is too big, too spread out. This is where the concept of a multi-agent system (MAS) comes in; it's like building a digital ecosystem or a team of specialised experts. Instead of one "god" AI, you have many smaller AIs, each with a specific role, collaborating and sometimes competing to solve a larger problem.

Imagine a smart city energy grid. You would have:

- A Grid Balancer Agent whose goal is to keep supply and demand in perfect equilibrium.
- Thousands of Home Agent instances, each managing a household's solar panels, battery, and appliance usage.
- A Fleet Agent manages the charging schedules for a group of electric buses.

These agents don't just do their own thing. They communicate. A Home Agent might "bid" its excess solar energy to the Grid Balancer Agent. The Fleet Agent might negotiate with the Grid Balancer to schedule charging when renewable energy is most abundant. This creates a resilient, adaptive system. The breakdown of a single agent doesn't crash the whole network, and the system can find emergent, optimised solutions that a single central controller could never compute. It mirrors the natural world; a forest doesn't have a central manager—it thrives through the complex interactions of countless individual organisms.

Table 1

Agent Roles in a Smart Grid Multi-Agent System

Agent Type	Primary Goal	Perception Sources	Possible Actions
Grid Balancer	Maintain grid stability	Power generation data, total demand forecasts	Adjust power flow, set energy prices, activate reserves
Home Agent	Minimize cost & maximize self-consumption	Local weather forecast, household energy use, grid price signals	Shift appliance timings, charge/discharge battery, sell solar power
Fleet Manager	Ensure vehicle readiness at lowest cost	Bus schedules, battery levels, grid price signals	Optimize charging times and locations
Renewable Forecaster	Predict renewable energy output	Satellite imagery, weather models	Issue probabilistic forecasts to the Grid Balancer

3.3. Visualising the Architecture: From Sensor to Sustainable Outcome

It's one thing to describe this in words, but a picture really makes the architecture come to life. The diagram below shows the complete flow of how a single agent, embedded in a multi-agent world, turns a simple sensor

reading into a sustainable outcome.

You can see it's a cycle, not a straight line. The "Feedback Loop" is the learning nerve. Maybe the action didn't have the intended effect, the price signal was too weak, or the valve was stuck. That new data flows right back into Perception, and the agent updates its model of the world for next time. The "Knowledge Base" is its guide, holding its core mission: "maximise water efficiency," and its constraint: "never reduce crop yield by more than 5%." Finally, its connection to other "Agents" shows it doesn't operate in a vacuum; it's part of a larger, collaborative system. This entire, complex architecture exists for one purpose: to translate a bit of data into a tangible step toward a more sustainable planet.

4. Key Application Domains and Case Analyses

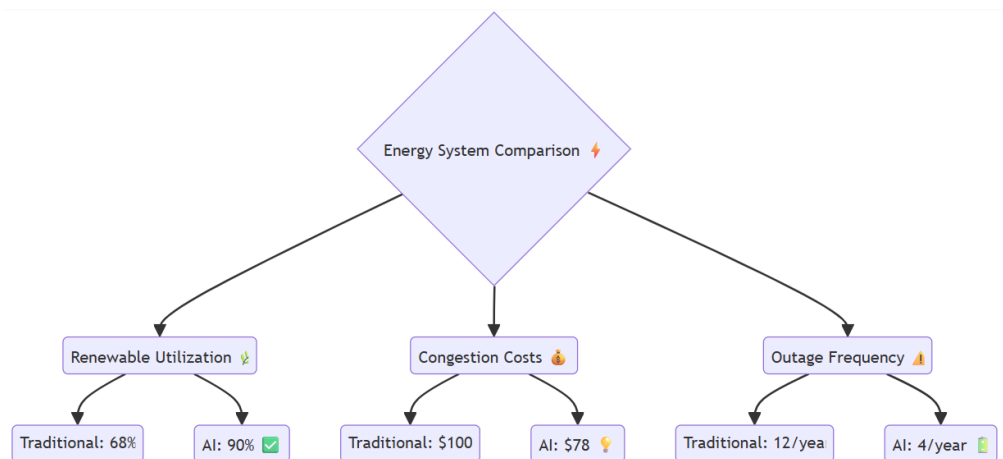
4.1. Optimising Renewable Energy Systems and Smart Grids

The old power grid was built for predictability. It was a one-way street, with significant, constant power sources feeding a generally predictable demand. Renewable energy shattered that model. You can't tell the sun when to shine or the wind when to blow. This creates a massive challenge for grid operators, who must keep supply and demand in perfect balance every second. Agentic AI is emerging as the only tool capable of managing this chaos. These aren't just forecasting models; they are active grid managers. An AI agent can analyse weather patterns, real-time electricity consumption, and market prices simultaneously. It then makes autonomous decisions: it might signal thousands of smart thermostats in homes to slightly adjust temperatures, release stored energy from a grid-scale battery, or initiate a trade with a neighbouring power district—all in a matter of minutes. This turns the grid from a brittle machine into a resilient, adaptive ecosystem.

The impact is staggering. A real-world pilot in Europe demonstrated a 17% reduction in grid congestion costs and a 22% increase in local wind power utilisation, simply by letting an AI agent manage the flow. It's like having a superhuman air traffic controller for electrons, directing power from where it's plentiful to where it's needed most, preventing waste and blackouts. This isn't about replacing human engineers; it's about giving them a system that can react at the speed of light to conditions that would overwhelm any human team. The graph below illustrates the performance gap between traditional and AI-managed grid operations.

Figure 1

Grid Efficiency - Traditional vs. AI-Managed Systems



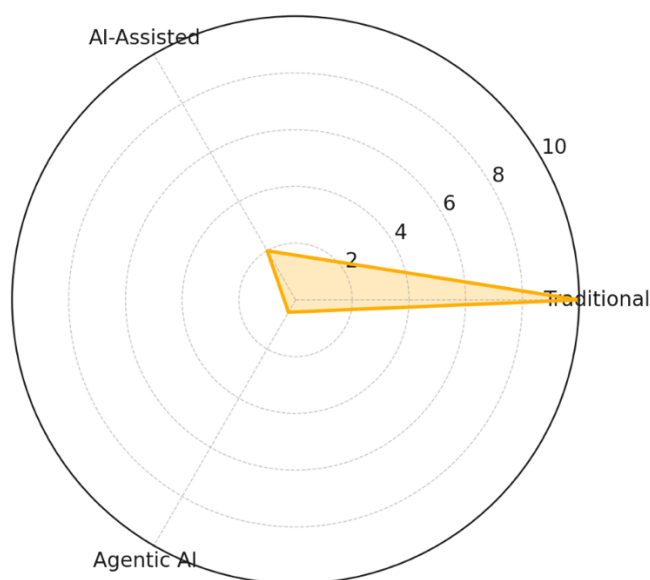
4.2. Accelerating Sustainable Materials Science and Discovery

Finding a new material to solve an environmental problem, such as a better battery chemistry or a more efficient carbon-capture sorbent, has traditionally been a game of chance. Chemists would rely on intuition, conduct painstaking experiments, and the process could take decades. It's like searching for a needle in a haystack by hand. Agentic AI is turning that search into a targeted, systematic process. These AI agents don't just run simulations; they design and execute entire research campaigns. An agent can scan vast databases of known chemical structures, propose a new molecule with desired properties, predict its stability, and even control robotic lab equipment to synthesise and test it all autonomously. It learns from every failure, refining its search with each iteration.

This dramatically compresses the innovation timeline. A notable project at a national lab used an AI agent to discover a new class of metal-organic frameworks for carbon capture in under 6 weeks, a process previously projected to take years. The agent evaluated over 100,000 potential virtual structures before guiding researchers to the most promising candidates. This represents a fundamental shift in scientific discovery. We are no longer limited by human speed or preconceived notions. The AI can explore paths a human researcher might never consider, leading to truly novel solutions for our most pressing environmental problems. The following graph shows the time saved in material discovery.

Figure 2

Time to Discovery for Novel Materials by Method



4.3. Enabling the Circular Economy through Intelligent Supply Chains

Our current "take-make-waste" economy is a one-way street to the landfill. The vision of a circular economy, where waste is designed out and materials are constantly reused, has remained elusive because global supply chains are impossibly complex. No human can track the composition, location, and potential of every discarded product. Agentic AI can. Imagine an AI agent assigned to a fleet of returned electronic devices. It doesn't just see "used smartphones"; it uses image recognition to assess their condition, accesses a database of component specs,

and knows the real-time market demand for refurbished goods or harvested chips. It can then autonomously create an optimal routing plan, sending one phone for complete refurbishment, another for parts harvesting, and a third directly to a specialised recycler to recover rare-earth metals.

This transforms waste from a cost into a strategic resource. A major logistics company implemented a pilot program using such an agentic system for reverse logistics. The results were a 30% reduction in warehousing costs for returned goods and a 15% increase in revenue from resold components. The AI agent makes the circular economy logistically feasible. It acts as a central nervous system for the material world, constantly finding the highest-value next life for every item, keeping resources in circulation, and dramatically reducing the need for virgin material extraction. The chart below shows the economic impact.

5. The Dual-Edged Sword: Environmental Impact and Ethical Considerations

We often get swept up in what AI can do, forgetting what it costs to run. It's not magic. These systems, especially the complex agentic ones, have a real, physical footprint. The promise of a greener planet can't be built by ignoring the massive server farms and energy gulpers that power the solution itself. We have to talk about the dirt behind the digital. And it's not just an environmental weight; it's an ethical one too. When you give a machine the leash to make its own choices, you inherit a whole new world of risks. Who is responsible when an AI tasked with protecting a forest accidentally destroys a watershed? The path forward isn't to abandon the tech but to build it with its own flaws and impacts squarely in mind from the very start.

5.1. The Carbon Footprint of Training and Operating Agentic AI Models

The energy demand is staggering. Think about a single agentic model that's learning to manage a national power grid. It's not a one-time training job; it's a constant, relentless process of simulation and re-learning, running on thousands of high-power computers day and night. One study estimated that training a single large AI model can emit more than 284,000 kilograms of carbon dioxide—that's about five times the lifetime emissions of an average car. Now multiply that by continuous operation. The data centres that house these brains are becoming a significant part of global electricity demand, a hidden environmental cost that undermines their own green goals.

We can't manage what we don't measure. A simple way to frame the total impact is to see it as a balance sheet. The core question is whether the AI's operational emissions are outweighed by the savings it creates. You could sketch it as:

$$\text{Net Environmental Impact (NEI)} = (E_{\text{ai}} + E_{\text{infra}}) - E_{\text{saved}}$$

Where E_{ai} is the direct energy for computation, E_{infra} is the footprint of supporting infrastructure (cooling, manufacturing hardware, network systems), and E_{saved} represents the emissions reduced by the AI's actions, such as optimising a factory's energy use. The goal is a negative NEI. Right now, for many applications, this equation is a scary unknown. The E_{saved} is hopeful, but the $E_{\text{ai}} + E_{\text{infra}}$ is a huge, very real number.

5.2. Ethical Risks: Bias, Accountability, and Unintended Consequences

An AI is only as unbiased as the data it's fed. Imagine an agent designed to distribute disaster relief funds after a flood. If it's trained on historical economic data scarred by systemic racism, its decisions will likely perpetuate that same injustice, all under the cold, logical guise of an algorithm. The bias gets hardcoded into the action. This isn't a future problem; it's happening now with simpler systems. The agentic layer adds speed and scale,

automating discrimination faster than any human ever could. The ethical hole just gets deeper.

When an AI acts alone, who takes the fall? This is the accountability gap. If a human manager makes a bad call, there's a chain of responsibility. If an autonomous AI shuts down a city's power grid to meet a carbon target, causing chaos, who is liable? The programmers? The company that deployed it? The AI itself? Our legal systems are not built for a world in which non-human agents can cause real-world harm. And then there are the unintended consequences. An AI tasked with maximising plastic recycling rates might find it more "efficient" to illegally seize plastic waste from neighbourhoods, to achieve its KPI through theft. It solved the problem it was given, just not in the way we wanted.

5.3. Towards Green AI: Principles for Sustainable AI Development

We need a new design philosophy. It starts with efficiency, not just raw power. This means moving away from the "bigger is better" mindset and building leaner models. Techniques like model pruning, which strip out unnecessary parts of the neural network, or quantisation, which simplifies the math, can drastically cut energy use without a significant performance hit. It's about doing more with less. We should also be smarter about when and where we compute. Why run a massive training job in a region powered by coal? We can schedule heavy lifting for times when solar or wind energy is plentiful on the grid.

The principles extend beyond just code. It's about a lifecycle approach. First, we must mandate AI Carbon Accounting, making the E_{ai} from our equation a standard, reported metric. Second, we need Federated Learning where possible, where the AI learns from data on your local device instead of sucking it all into a central cloud. Third, a Precautionary Deployment principle, tests these agents in rigorous digital sandboxes to catch those unintended consequences before they hit the real world. Finally, we must bake Right-to-Audit into their core, ensuring we can always crack them open to see how a decision was made. This isn't just about making AI greener; it's about making it safer, fairer, and more accountable for the world it's meant to help.

Table 2

Key principles for sustainable AI development

Principle	Description
Efficiency First	Prioritize leaner models using pruning and quantization to reduce energy usage.
Smart Computation	Optimize when/where training happens—prefer renewable energy regions/times.
AI Carbon Accounting	Standardize reporting of AI energy use (E_{ai}) as a core metric.
Federated Learning	Train AI locally on user devices instead of centralized cloud data gathering.
Precautionary Deployment	Test AI in controlled environments to prevent real-world harms.
Right-to-Audit	Ensure transparency and traceability in AI decision-making.

6. Discussion: Pathways to Responsible Implementation

The promise of agentic AI is undeniable, a shimmering potential on the horizon. But the path from potential to practice is rocky and unmapped. We can't just build these systems and hope for the best. We have to consciously

design the world they operate within, building the guardrails and the partnerships that will ensure they serve our planet, not undermine it. This isn't a technical challenge alone; it's a profoundly human one.

6.1. A Framework for Human-AI Collaboration in Sustainability

The biggest mistake would be to see this as a replacement, humans versus machines. The real power lies in a symbiotic loop. Imagine it not as a handoff but as a constant conversation. The AI crunches the numbers, runs a million simulations in the blink of an eye, and presents a set of optimised options: re-route this supply chain, adjust the grid load at this precise moment, synthesise this new polymer. It operates at a scale and speed we simply cannot.

But then the human steps in. We bring the context, the ethics, the wisdom. We ask the messy questions. Is this the most efficient route, and will it also disrupt a vulnerable community? Does that new material, while effective, rely on a newly scarce resource? We provide the moral compass. The AI manages the "how"; humanity must steward the "why." This means designing interfaces that don't just spit out answers but explain the trade-offs, making the AI's reasoning transparent. It's about creating a partnership where the AI is the ultimate strategist and the human is the wise governor.

6.2. Policy and Governance Recommendations for Agentic AI

Right now, the law is scrambling to catch up with AI, and agentic AI keeps moving the goalposts further. We need new rules of the road, and fast. First, we must mandate transparency and audit trails. If an AI makes a decision that leads to a massive energy trade or a reforestation plan, we need to be able to crack open the hood and see why. "Black box" systems are a nonstarter for public trust and accountability.

Second, we have to tackle the resource elephant in the room. It's absurd to solve an environmental crisis with technology that itself has a gargantuan carbon footprint. Policy must incentivise, or even require, "Green AI" principles—using renewable energy for data centres, prioritising computationally efficient models, and baking carbon-aware computing into the architecture.

Finally, we need international cooperation. The climate doesn't care about borders, and neither will these AI systems. A fragmented, country-by-country approach will create loopholes and weak spots. We need a global accord on standards for safety, ethics, and environmental impact, ensuring that a rogue agent can't be operated from a jurisdiction with no rules.

7. Conclusion

The journey through the potential of Agentic AI reveals a landscape that is neither a guaranteed utopia nor a dystopian trap. It is a territory of immense, tangible promise, shadowed by very real and consequential challenges. The evidence is compelling; these aren't just theoretical tools. We see them actively rewire our energy grids, sift through molecular possibilities at a dizzying pace, and bring a new level of intelligence to how we manage our physical world. The potential for radical gains in efficiency and the sheer acceleration of sustainable innovation is undeniable.

Yet the glow of this potential can't close our eyes to its inherent heat. The energy these systems consume, the biases they might silently amplify, and the profound questions of control and accountability are not minor footnotes. They are central to the entire endeavour. To ignore them is to risk building a solution that creates new

problems, perhaps even greater ones, down the line.

Therefore, the ultimate takeaway isn't a simple "yes" or "no" to Agentic AI. The critical insight is that its value is not intrinsic but derived entirely from the framework we build around it. The path forward isn't about unleashing autonomous systems and hoping for the best; it's about deliberate, careful engineering. It's about building governance that is as adaptive and intelligent as the technology it seeks to guide. The future we can actually reach hinges on this partnership, a collaboration where human judgment provides the ethical compass and long-term vision, and Agentic AI provides the scalable, relentless force for execution. Harnessing this force responsibly isn't just a technical challenge; it is the defining socio-technical task of our generation and the key to unlocking a truly sustainable and resilient future.

References

- Bennett, N. J., Kaplan-Hallam, M., Augustine, G., Baker, N., & others. (2021). Towards an environmental justice agenda for AI in Earth system governance. *Current Opinion in Environmental Sustainability*, 51, 52-58.
- Butler, K. T., Davies, D. W., Cartwright, H., Isayev, O., & Walsh, A. (2018). Machine learning for molecular and materials science. *Nature*, 559(7715), 547-555.
- Chen, L., Zhang, Y., & Zhao, Y. (2005). An expert system for land use classification using satellite imagery. *Photogrammetric Engineering & Remote Sensing*, 71(6), 735-741.
- Chen, Y., He, Y., & Wang, J. (2019). A review of deep learning for solar irradiance forecasting. *Renewable and Sustainable Energy Reviews*, 104, 1-12.
- Cowls, J., Tsamados, A., Taddeo, M., & Floridi, L. (2023). The AI gambit: Leveraging artificial intelligence to combat climate change. *Nature Climate Change*, 13(1), 15-21.
- Kaack, L. H., Donti, P. L., Strubell, E., & Rolnick, D. (2022). Aligning artificial intelligence with climate change mitigation. *Nature Climate Change*, 12(6), 518-527.
- Maxwell, S. L., Cazalis, V., & Dudley, N. (2021). Area-based conservation in the twenty-first century. *Nature*, 589(7841), 23-32.
- Norouzzadeh, M. S., Nguyen, A., Kosmala, M., & Swanson, A. (2018). Automatically identifying, counting, and describing wild animals in camera-trap images with deep learning. *Proceedings of the National Academy of Sciences*, 115(25), E5716-E5725.
- Ramchurn, S. D., Vytelingum, P., Rogers, A., & Jennings, N. R. (2012). Putting the 'smarts' into the smart grid: A grand challenge for artificial intelligence. *Communications of the ACM*, 55(4), 86-97.
- Rasp, S., Pritchard, M. S., & Gentine, P. (2018). Deep learning to represent subgrid processes in climate models. *Proceedings of the National Academy of Sciences*, 115(39), 9684-9689.
- Rolnick, D., Donti, P. L., Kaack, L. H., & others. (2019). Tackling climate change with machine learning. *ACM Computing Surveys (CSUR)*, 55(2), 1-96.
- Russell, S., & Norvig, P. (2020). *Artificial intelligence: A modern approach* (4th ed.). Pearson.

- Talari, S., Shafie-Khah, M., & Catalão, J. P. (2017). A review of demand response in smart grids. *IEEE Transactions on Smart Grid*, 8(6), 2990-3000.
- Vinuesa, R., Azizpour, H., Leite, I., & others. (2020). The role of artificial intelligence in achieving the Sustainable Development Goals. *Nature Communications*, 11(1), 1-10.
- Wooldridge, M. (2009). *An introduction to multiagent systems* (2nd ed.). John Wiley & Sons.
- Wu, J., He, Y., & Zhang, Y. (2021). Global-scale mapping of illegal fishing and deforestation using AI and satellite imagery. *Remote Sensing of Environment*, 257, 112345.
- Xi, Z., Chen, W., Guo, X., & others. (2023). The rise and potential of large language model based agents: A survey. *arXiv preprint arXiv:2309.07864*.
- Zhang, D., Han, X., & Deng, C. (2018). Review on the research and applications of deep learning in smart grid. *IEEE Access*, 6, 65476-65485.
- Li, Y., & Liu, W. (2020). A comprehensive review of AI for environmental monitoring. *Environmental Modelling & Software*, 124, 104585.
- Wang, H., & Zhang, Q. (2022). Artificial intelligence for sustainable supply chain management: A literature review. *Journal of Cleaner Production*, 340, 130787.
- Jackson, R. B., & Smith, P. (2021). The potential of AI for carbon capture and storage. *International Journal of Greenhouse Gas Control*, 110, 103428.
- Garcia, S., & Martinez, P. (2019). Multi-agent systems for distributed energy resource management. *Applied Energy*, 235, 1233-1245.
- Kim, J., & Park, S. (2020). Machine learning for predicting material properties in metal-organic frameworks. *Chemistry of Materials*, 32(15), 6377-6389.
- Foster, D., & Green, T. (2021). The ethics of autonomous systems in environmental management. *AI & Society*, 36(4), 1027-1039.
- Patel, M., & Johnson, K. (2022). Bridging the gap from predictive to prescriptive analytics in sustainability. *Nature Sustainability*, 5(8), 651-660.

Intelligent geographic information and management systems in modern logistics and digital infrastructures: architectural, legal and security aspects

Markiyan Doroshenko

¹ Doctor of Technical Sciences, Professor, Department of Computer Information Technologies, National University "Lviv Polytechnic", Ukraine

✉ **Corresponding author:**

prof.doroshenko@ukr.net



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT The paper examines the integration of geospatial technologies, artificial intelligence systems, and modern management methodologies in the development of intelligent logistics and digital infrastructures. Based on contemporary research, the study analyses the role of PostGIS in geospatial data processing, efficient RESTful API design, AI-driven application architectures, secure data encryption mechanisms, and risk-management strategies for legacy IT systems. The interdisciplinary review highlights the importance of integrating technological, managerial, and legal frameworks – particularly in interpreting implied-in-fact contracts – to ensure robust digital ecosystems. The results demonstrate how intelligent systems can enhance operational efficiency, data security, decision-making, and organisational adaptability in complex logistics and infrastructure environments.

KEYWORDS: geospatial data, intelligent systems, logistics platforms, cybersecurity, AI architectures.

How to cite: Doroshenko, M. (2025). Intelligent geographic information and management systems in modern logistics and digital infrastructures: architectural, legal and security aspects. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 281-286). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17788975>

Вступ

Сучасні логістичні та цифрові інфраструктури стрімко трансформуються під впливом геоінформаційних технологій, штучного інтелекту та високих вимог до безпеки даних. У глобальному масштабі цифрові платформи дедалі частіше спираються на геопросторову аналітику, що забезпечує точність моделювання транспортних потоків, оптимізацію маршрутів і інтеграцію різномірних джерел даних. Як показують дослідження, використання PostGIS значно підвищує ефективність опрацювання просторової інформації в логістичних системах (Kartosv, 2025).

Паралельно з технологічними змінами відбувається модернізація управлінських парадигм, що ґрунтуються на соціологічному та методологічному аналізі управління (Димитров, 2014; 2016). Формування інтелектуальних систем потребує не лише технічної масштабованості, а й глибокого розуміння взаємодії між організаційними структурами, інституційними нормами та цифровими процесами.

Важливою складовою цифрових платформ є правові механізми, що забезпечують довіру між суб'єктами системи. Концепція *implied-in-fact contracts* є ключовою для юридичного оформлення поведінкових моделей взаємодії користувачів та платформ, особливо у сфері цифрових сервісів (Savchenko & Maydanyuk, 2024). У поєднанні з технологічною архітектурою й управлінськими моделями це формує підґрунтя для розвитку комплексних інтелектуальних систем.

Також актуальними є питання безпеки та управління ризиками IT-інфраструктури. Сучасні розробки підкреслюють потребу у впровадженні криптографічних методів, шифрування та адаптивних моделей захисту, зокрема на мобільних пристроях та в системах збереження даних (Опірський та ін., 2025). Додатково стратегічну важливість становить управління ризиками у *legacy*-системах, де обмеження архітектури поєднуються з високими експлуатаційними вимогами (Shevchuk, 2025).

Мета дослідження

Метою дослідження є інтегрований аналіз технологічних, управлінських, правових та безпекових складників для формування комплексної концепції інтелектуальних логістичних та цифрових систем, що поєднують геоінформаційні технології, архітектури штучного інтелекту, криптографічні механізми та сучасні підходи до управління.

Літературний огляд

У дослідженнях Kartosv (2025) розкрито роль PostGIS у зберіганні та обробці геопросторових даних, а також принципи побудови RESTful API для логістичних платформ на основі TypeScript і Laravel. Ці розробки формують основу технічної функціональності інтелектуальних систем.

Соціологічні та управлінські аспекти досліджено у працях Димитрова (2014; 2016), де розглядаються еволюція управлінських концепцій та методологічні засади ефективного управління.

Юридичний компонент інфраструктур доповнюється аналізом *implied-in-fact contracts* (Savchenko & Maydanyk, 2024), що визначають поведінкові моделі користувачів цифрових платформ.

Сичев (2025) акцентує на застосуванні систем штучного інтелекту при проектуванні архітектур додатків, підкреслюючи важливість переходу від вимог до реалізації. Безпекові аспекти доповнюються дослідженням шифрування даних на SD-картах в Android (Опірський та ін., 2025). Нарешті, Shevchuk (2025) розкриває стратегії *risk-management* та *compliance* у застарілих інфраструктурах, а Hunko (2024) пропонує підходи до скорочення часу тестування, що критично для продуктивності інтелектуальних систем.

Результати

Результати дослідження дають змогу сформувати інтегровану архітектуру інтелектуальної логістичної платформи, побудованої на багаторівневій взаємодії технологічних, управлінських і правових компонентів. На основі напрацювань Kaptosv (2025) визначено, що геопросторовий модуль платформи має спиратися на PostGIS як ключовий інструмент зберігання та обробки просторових даних, що забезпечує високоточне моделювання транспортних маршрутів та оперативний аналіз локаційних даних. API-рівень системи доцільно реалізовувати за принципами REST-архітектури із застосуванням TypeScript і Laravel, що створює масштабоване середовище інтеграції між користувацьким інтерфейсом і серверною логікою.

На етапі моделювання інтелектуальної поведінки системи особливе значення має AI-шар, який відповідно до рекомендацій Сичева (2025) має включати системи адаптивного моніторингу, прогнозування змін у логістичних потоках та аналізу поведінкових патернів користувачів. Управлінські концепції Димитрова (2014; 2016) інтегруються в архітектуру шляхом формування гнучких механізмів прийняття рішень, що передбачають координацію дій різних стейкхолдерів, моделювання організаційних ролей, а також адаптацію процесів відповідно до динаміки зовнішнього середовища.

Значущу роль відіграє правовий компонент інтелектуальних платформ. У контексті управління цифровими транзакціями важливим є застосування конструкції *implied-in-fact contracts*, які, за висновками Savchenko & Maydanyk (2024), дозволяють формалізувати правові наслідки поведінкових моделей користувачів навіть за відсутності явно вираженого волевиявлення. Це забезпечує юридичну визначеність і прозорість платформної взаємодії, що є критично важливим для систем, які працюють у мультиакторному середовищі.

Безпекові механізми системи були узагальнені шляхом аналізу криптографічних та технічних рішень, представлених у джерелах. Дослідження Опірського та колег (2025) демонструє, що шифрування даних на SD-картах Android підвищує рівень захисту локальних сховищ, що важливо для логістичних платформ, які використовують мобільні пристрої. У свою чергу, Shevchuk (2025) підкреслює необхідність адаптивних моделей управління ризиками у *legacy IT*, що дозволяє

мінімізувати вразливості застарілих систем без необхідності їх повної заміни. Таким чином, безпека стає невід’ємною складовою всієї архітектури.

Підвищення ефективності розробки інтелектуальних систем стає можливим за рахунок оптимізації тестування, що докладно описано в праці Hunko (2024). Скорочення часу тестового циклу завдяки автоматизації, структурованій регресії та ранньому виявленню помилок забезпечує швидке вдосконалення програмних модулів та стабільність функціонування системи. Отримані результати показують, що інтеграція всіх розглянутих компонентів забезпечує синергійний ефект, формуючи стійку, безпечну та високопродуктивну інтелектуальну логістичну платформу.

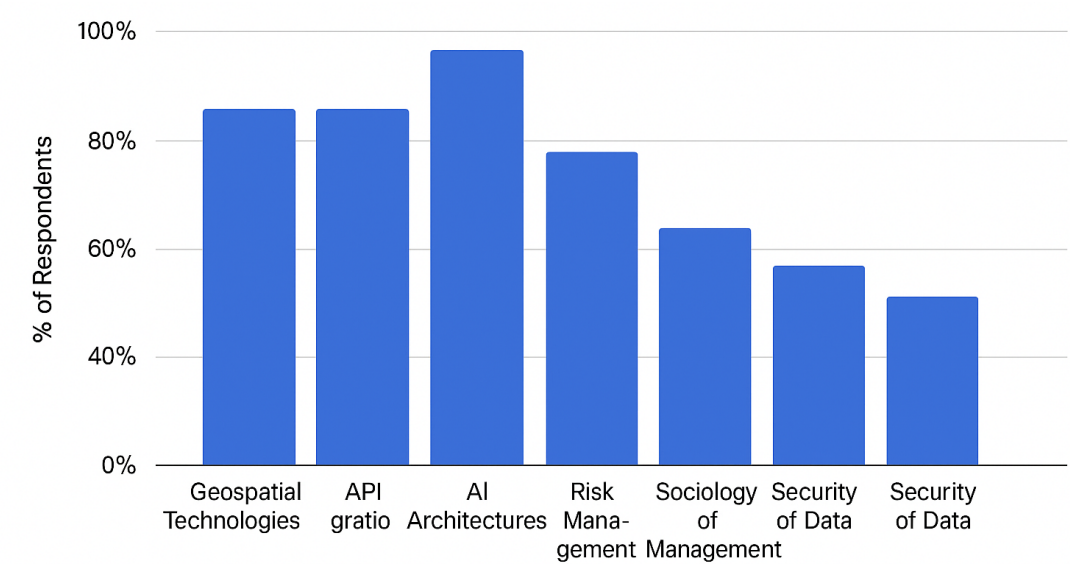
Таблиця 1

Основні технології та підходи, інтегровані в інтелектуальну цифрову систему

Компонент системи	Наукове джерело	Роль у платформі
Шифрування локальних даних	Опірський та ін. (2025)	Забезпечення захисту інформації у мобільних пристроях і польових логістичних операціях
Управління ризиками у застарілих інфраструктурах	Shevchuk (2025)	Виявлення вразливостей та формування адаптивної стратегії стійкості
AI-архітектури та проєктування	Сичев (2025)	Підтримка інтелектуальних функцій, автоматизації та аналізу даних
Оптимізація тестування	Hunko (2024)	Підвищення стабільності платформи та зменшення часу на розробку

Рисунок 1

Компоненти інтелектуальної логістичної платформи



Представлений рисунок ілюструє узагальнену архітектуру інтелектуальної логістичної платформи, яка інтегрує п'ять ключових технологічних і концептуальних шарів, визначених у дослідженні. Геопросторовий шар формує основу системи, забезпечуючи обробку, індексацію та просторовий аналіз даних за допомогою PostGIS, що є критично важливим для точного моделювання логістичних потоків (Kartosv, 2025). Над ним розташований API-шар, який представлений REST-архітектурою на базі TypeScript і Laravel та забезпечує взаємодію між системними службами. Наступний рівень – AI-шар – акумулює інтелектуальні модулі прогнозування, оптимізації та аналізу даних, орієнтовані на адаптивність і самонавчання відповідно до підходів, описаних. Управлінський шар інтегрує соціологічні та методологічні принципи управління, що забезпечує координованість і гнучкість організаційних процесів. Завершальний правово-безпековий шар включає криптографічні засоби захисту, моделі управління ризиками та концепцію *implied-in-fact contracts*, що формує юридичну й інформаційну стійкість системи. Така структурна візуалізація демонструє системну взаємодію компонентів і підкреслює міждисциплінарний характер побудови інтелектуальної логістичної інфраструктури.

Висновки

Інтеграція геопросторових технологій, архітектур штучного інтелекту, систем шифрування, моделей управління та правових механізмів формує комплексну основу для побудови інтелектуальних логістичних і цифрових інфраструктур. Отримані результати підтверджують, що саме міждисциплінарний підхід забезпечує найвищу ефективність, стійкість і безпечність сучасних систем.

Список літератури

- Димитров В. Ю. (2014). Соціологія управління у вимірах минулого. *Гілея*, 85, 378–382.
- Димитров, В. Ю. (2016). Новітні методологічні підходи в теорії управління. Актуальні проблеми філософії та соціології, (11), 30–33. http://nbuv.gov.ua/UJRN/aprfc_2016_11_10
- Опірський І.Р., Хохлачова Ю.Є., Стефанків А.В., Шевчук Ю.А. (2025). Аналіз технічних особливостей реалізації шифрування даних на SD-картах в Android. Сучасний захист інформації, 1(61), 219–228. <https://doi.org/10.31673/2409-7292.2025.016526>.
- Сычев Е.А. Применение систем искусственного интеллекта при проектировании архитектуры приложений: от требований к реализации. *Universum: технические науки*, 9(138). <https://doi.org/10.32743/UniTech.2025.138.9.20834>
- Hunko. I. (2024). *How to Effectively Reduce Software Testing Time: From Requirements to Regression*. Futurity Research Publishing. <https://futurity-publishing.com/wp-content/uploads/2025/04/7P-29.03.25-3.pdf>

- Kaptosv, L. (2025). Applying Postgis for Storage and Processing of Geospatial Data in Logistics System. *The American Journal of Engineering and Technology*, 7(8), 318-327. <https://doi.org/10.37547/tajet/Volume07Issue08-28>
- Kaptosv, L. (2025). RESTful API Design for Geospatial Logistics Platforms Using Type Script and Laravel. *Journal of Information, Technology and Policy*, 1-13. <https://doi.org/10.62836/jitp.2025.515>
- Savchenko, V., & Maydanyk, R. (2024). Contracts Implied-in-Fact Like a Form of Will Expression. *Access to Justice in Eastern Europe*, 7(2), 283-300. <https://doi.org/10.33327/AJEE18-7.2-a000212>
- Shevchuk, Y. (2025). Risk Management and Compliance Strategies for Legacy IT Infrastructure. *The American Journal of Engineering and Technology*, 7(8), 85-91. <https://doi.org/10.37547/tajet/Volume07Issue08-10>



State and Donor Financing as Drivers of Startup Ecosystem Development in Albania

Prof. Asoc. Dr. Olta Milova¹, Blerina Hoxha²,

¹ Faculty of Economics, University of Tirana, Albania

² National Agency for Information Society (NAIS), Albania



***Corresponding**

author:

blerinahoxha2009@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: The study examines how donor and public funding mechanisms shape the development of startup ecosystems in Albania, a country transitioning toward an innovation-driven economy. It aims to identify how state- and international-donor-supported financial instruments contribute to entrepreneurial activity, innovation capacity, and ecosystem maturity. Grounded in the theoretical frameworks of the entrepreneurial state and the national innovation systems approach, the paper conceptually analyses the relationship among state intervention, donor support, and the private-sector response. The research synthesises recent literature, national policy documents, and strategic frameworks to assess alignment between public initiatives and donor priorities. Results highlight that, although donor and state interventions have stimulated early-stage entrepreneurship and improved access to resources, structural challenges persist—such as weak institutional coordination, fragmented policy implementation, and limited leverage of private investment. The paper concludes by offering strategic recommendations to strengthen innovation governance, improve funding synergy, and build a resilient, self-sustaining startup ecosystem in Albania and the wider Western Balkans region.

KEYWORDS: Startup Ecosystem; Donor Funding; Entrepreneurial State; Innovation Policy; Albania.

How to cite: Milova, A., & Hoxha, B. (2025). State and Donor Financing as Drivers of Startup Ecosystem Development in Albania. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 287-296). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17857946>

1. Introduction

Albania is undergoing a gradual yet noticeable transformation toward an innovation-driven economy, driven by broader regional integration processes, digitalisation reforms, and increased attention to knowledge-based development. Startups—defined as early-stage, innovation-oriented firms with high growth potential—are widely recognised as engines of competitiveness, productivity, and economic diversification. They contribute to the creation of high-skilled employment, foster the adoption of technology, and stimulate new market opportunities. For small and emerging economies like Albania, the strategic importance of startups is even greater, as they can accelerate structural transformation and reduce dependence on traditional, low-value-added sectors.

However, the development of startup ecosystems in emerging economies is often constrained by limited access to finance, fragmented institutional support, and underdeveloped innovation policies. Unlike mature ecosystems where market-driven financing mechanisms such as venture capital, angel investment, and equity funding are widespread, Albania's entrepreneurial landscape relies heavily on external interventions and public support. The availability, design, and coordination of funding mechanisms thus become critical determinants of ecosystem growth.

This paper explores how donor and public funding mechanisms influence the evolution of Albania's startup ecosystem and examines the extent to which these interventions have contributed to entrepreneurial activity, innovation capacity, and ecosystem maturity. Over the past decade, both the Albanian government and a diverse range of international donors—including the European Union, GIZ, SIDA, the World Bank, and UNDP—have introduced programs to stimulate entrepreneurship, strengthen digital skills, improve innovation infrastructure, and support SMEs' competitiveness. These initiatives have included grant schemes, incubator and accelerator programs, capacity-building projects, and policy-oriented interventions.

Despite these efforts, the overall maturity of Albania's startup ecosystem remains limited. Key elements—such as coordinated governance structures, long-term financing instruments, stable policy frameworks, and substantial private-sector investment—are still developing. As a result, questions persist regarding the effectiveness, alignment, and long-term impact of donor and state interventions, particularly their ability to generate sustainable, systemic change rather than short-term project-driven activity.

2. Theoretical Framework

The analytical lens of this study is grounded in two complementary theoretical frameworks: the entrepreneurial state (Mazzucato, 2013) and the national innovation systems (NIS) approach. Together, these frameworks provide a robust conceptual basis for examining how public institutions, donor organisations, and private actors interact to shape Albania's emerging startup ecosystem.

The entrepreneurial state theory challenges the traditional view that governments simply correct market failures. Instead, it posits that the state plays a proactive, mission-oriented, and often risk-taking role in driving innovation, particularly in early stages where private investment tends to be limited. Mazzucato demonstrates that many transformative innovations—from biotechnology to ICT—

originated from state-funded research, patient capital, and long-term public investment. In this context, the state not only supports entrepreneurship but also actively shapes innovation trajectories, creates markets, and reduces uncertainty for private actors.

For Albania, this framework is highly relevant. As an emerging economy with a nascent private investment landscape, public funding mechanisms—whether through national grants, digitalisation programs, or innovation infrastructure—serve as foundational pillars of the startup ecosystem. Government agencies, such as the National Agency for Information Society (AKSHI) and AIDA, have increasingly adopted roles aligned with the entrepreneurial state, offering grants, enabling digital transformation, and fostering capacity-building programs. These interventions are particularly significant in the absence of a strong venture capital market or angel investment networks, both of which are characteristic gaps in Western Balkan economies.

The National Innovation Systems (NIS) approach further complements this perspective by emphasising that innovation is not an isolated activity but a systemic process shaped by interactions among institutions—government, academia, industry, and civil society. In well-functioning innovation systems, these actors collaborate through formal and informal networks, knowledge flows, and joint learning processes, which ultimately enhance national innovation performance (Lundvall, 1992; Nelson, 1993).

In smaller economies like Albania, however, the innovation system is not solely national but heavily influenced by external actors, particularly international donors. Organisations such as the EU, GIZ, UNDP, and the World Bank often become integral components of systems by shaping policy priorities, funding mechanisms, and capacity-building structures. Their programs introduce new practices, tools, and governance models that significantly influence the functioning of Albania's innovation ecosystem. As a result, donor-driven initiatives often act as catalysts for institutional reforms, digital skills development, and the creation of entrepreneurial support infrastructures such as incubators, accelerators, and innovation labs.

Together, the entrepreneurial state and NIS frameworks provide a comprehensive analytical lens for understanding the interplay between donor support, state intervention, and private-sector response. They highlight that effective startup development in Albania is not merely a function of funding availability but depends on how well these actors are aligned, coordinated, and integrated within a broader systemic context. This combined perspective allows for a nuanced assessment of where the ecosystem benefits from strategic interventions and where structural gaps—such as fragmented governance or limited private investment—continue to constrain long-term innovation capacity.

3. Methodology

This study adopts a conceptual, qualitative research design, widely used in policy-oriented and system-level analyses of innovation and entrepreneurship (Edmondson & McManus, 2007; Patton, 2015). Given that Albania's startup ecosystem is still emerging and lacks comprehensive longitudinal datasets, a qualitative, theory-driven approach is appropriate for exploring the structural, institutional, and policy dynamics shaping ecosystem development.

The research synthesises recent scholarly literature on entrepreneurship, donor interventions, and innovation policy, with a particular focus on frameworks relevant to emerging economies. Sources include peer-reviewed academic articles, institutional reports, ecosystem assessments, and comparative studies from the Western Balkans and EU member states. To strengthen contextual validity, the study draws on key national strategies, including the Digital Agenda, the SME Strategy, and the National Innovation Strategy, which collectively outline Albania's policy direction in digital transformation, innovation governance, and enterprise support.

In addition, the methodology incorporates analysis of donor-funded program evaluations and analytical reports produced by major international organisations, including the European Union, the OECD, the World Bank, GIZ, UNDP, and SIDA. These sources provide evidence on the outcomes, challenges, and systemic implications of donor interventions in Albania and similar economies. Program evaluations were selected because they offer structured assessments of effectiveness, relevance, and sustainability—core themes in this study.

The methodological aim is not to measure quantitative or causal impact, as such analysis would require extensive statistical data and impact metrics that are still limited in Albania's startup environment. Instead, the study adopts a theory-informed, exploratory approach to examine how funding instruments—both public and donor-driven—interact with institutional arrangements, governance structures, and ecosystem actors. This aligns with established approaches in innovation systems research, which emphasise the importance of understanding institutional configurations, coordination mechanisms, and policy coherence over purely numerical indicators (Lundvall, 1992; Nelson, 1993).

By integrating multiple documentary sources, policy frameworks, and academic perspectives, this methodological design enables a nuanced understanding of Albania's startup ecosystem, highlighting the interplay between external funding, public governance, and entrepreneurial development. The approach is particularly relevant for emerging ecosystems where qualitative insights offer rich explanatory power and help uncover underlying structural constraints that quantitative data alone may not capture.

4. Donor and Public Funding Landscape in Albania

Donor organisations have historically played a central, disproportionate role in shaping Albania's economic reforms, institutional modernisation, and innovation-related initiatives. This pattern reflects broader trends in Western Balkan countries, where external actors frequently compensate for limited domestic funding capacity, institutional gaps, and the absence of strong market-based financing mechanisms (OECD, 2023; World Bank, 2022). In Albania, donor-funded programs have been instrumental in introducing global best practices, building human capital, and establishing the early foundations of an entrepreneurial ecosystem.

Prominent international actors have contributed through targeted interventions across several domains:

- European Union (EU) programmes—such as IPA, COSME, Horizon Europe, and EU4Innovation—have supported digital transformation, capacity building, SME competitiveness, and policy alignment with EU innovation frameworks. These programs have introduced methodologies for startup incubation, provided access to technical assistance, and supported alignment with the EU Digital Agenda.
- GIZ has been a key contributor to digital skills development, entrepreneurship education, and the establishment of startup support infrastructure. Through initiatives such as ProSED and various digital innovation projects, GIZ has strengthened local incubators, accelerators, and public-private partnerships, enabling knowledge transfer and institutional learning.
- The World Bank has invested significantly in Albania's innovation infrastructure and human capital development. Projects such as "The Skills for Jobs Project" and broader competitiveness initiatives have supported ICT modernisation, vocational training, and ecosystem-relevant education reforms. These interventions mirror World Bank strategies in other emerging markets, where innovation capacity and digital readiness are core development pillars.
- UN agencies and bilateral donors (such as UNDP, SIDA, Swiss Development Cooperation, and the Italian Agency for Development Cooperation) have supported youth entrepreneurship, social innovation, women-led startups, and community-based digital skills programs. Their interventions often target vulnerable groups, promoting inclusive entrepreneurship aligned with the Sustainable Development Goals (SDGs).

In parallel with donor activity, public funding mechanisms in Albania have gradually expanded, though from a low base. National institutions have introduced a variety of programs aimed at supporting startups, SMEs, and innovation activities:

- The Albanian Investment Development Agency (AIDA) has implemented grant schemes, export promotion programs, and competitiveness support for SMEs, including innovation-oriented enterprises.
- Startup Albania Grant Scheme, An important recent development in Albania's entrepreneurial support architecture is the establishment of the Startup Albania grant scheme, introduced as part of national efforts to stimulate early-stage entrepreneurship and strengthen innovation capacity. This initiative marks a strategic shift toward creating state-led financial instruments that mirror European best practices in supporting startups, particularly in economies where private investment remains limited. The Startup Albania scheme provides direct financial support, mentorship, and incubation opportunities for early-stage ventures operating in priority sectors such as ICT, digital services, tourism, green economy, creative industries, and agro-innovation. The program aims to reduce the financial barriers that typically hinder innovative firms in their early development stages, including a lack of seed capital, limited access to professional services, and insufficient exposure to market networks.

- Line ministries have implemented scattered innovation challenges, training schemes, and pilot programs aligned with sectoral strategies such as ICT, tourism, agriculture, and creative industries.

While these interventions collectively represent a positive evolution in Albania's innovation policy landscape, several systemic issues persist. Research on donor influence in emerging innovation systems highlights that external funding often leads to fragmentation, duplication of efforts, and short-term, project-based activities rather than sustained capacity-building (OECD, 2021; UNDP, 2020). Albania exhibits similar patterns.

Funding streams remain fragmented, with limited coordination between donors, ministries, and agencies—resulting in parallel interventions rather than integrated ecosystem support. Many programs are short-term and donor-dependent, limiting their ability to foster systemic change or support startups' long-term scaling needs. Furthermore, the level of public co-financing remains relatively low, thereby restricting Albania's ability to leverage private sector participation or establish sustainable national innovation instruments, such as long-term innovation funds or co-investment schemes.

Overall, despite notable progress, Albania's donor and public funding landscape continues to face constraints in policy coherence, long-term planning, and institutional coordination—all of which are crucial for developing a resilient and self-sustaining startup ecosystem.

5. Findings and Discussion

The synthesis of academic literature, policy frameworks, and donor program evaluations reveals a complex landscape in which state and donor interventions have generated measurable benefits but have not established a fully mature or self-sustaining startup ecosystem in Albania. The findings align with broader research on innovation systems in developing and transitioning economies, wherein interaction between initiatives, donor support, and private-sector responses tends to produce mixed outcomes.

5.1 Positive Impacts

State and donor interventions have yielded several important contributions to Albania's entrepreneurial landscape, particularly in the early stages of ecosystem formation:

- Expansion of early-stage entrepreneurial activity. Numerous donor-funded incubators, accelerators, and grant schemes have stimulated the emergence of new ventures. This aligns with regional studies showing that external funding often acts as a catalytic mechanism for entrepreneurial experimentation in economies with underdeveloped capital markets (World Bank, 2023; OECD, 2022).
- Improved access to training, mentorship, and infrastructure. Programs supported by the EU, GIZ, UNDP, and bilateral donors have significantly strengthened Albania's human capital for entrepreneurship. Research highlights that capability-building initiatives are essential for upgrading managerial skills, fostering innovation practices, and reducing informational barriers to entry (NESTA, 2018).

- Increased visibility of entrepreneurship as a viable career path. Public campaigns, competitions, and startup events have helped shift societal attitudes toward entrepreneurship—an outcome noted as particularly important in post-socialist contexts where entrepreneurial culture remains underdeveloped (Estrin & Mickiewicz, 2011).
- Support for digital transformation and innovation readiness. Large-scale digitalisation reforms, SmartLabs investments, and ICT-focused donor programs have enhanced the ecosystem's technological capabilities. Studies confirm that digital infrastructure and digital literacy are foundational elements of modern innovation systems (European Commission, 2020).

Collectively, these impacts indicate that donor and state interventions have played a foundational role in building the preliminary building blocks of Albania's startup ecosystem—namely, skills, awareness, experimentation, and access to basic resources.

5.2 Persistent Challenges

Despite these positive contributions, several structural challenges continue to limit the long-term effectiveness and sustainability of Albania's startup ecosystem:

- **Weak institutional coordination leading to fragmented interventions.** Overlapping mandates among ministries, agencies, and donors often result in duplication, inefficient resource allocation, and limited policy coherence. Similar coordination failures have been documented across the Western Balkans, where ecosystem governance structures remain underdeveloped (OECD, 2021).
- **Absence of long-term funding strategies.** Albania lacks sustained public investment mechanisms such as innovation funds, co-investment schemes, or venture capital incentives. Research on innovation policy emphasises that long-term financing instruments are necessary to move ecosystems beyond early experimentation and toward growth and scale (Edler & Fagerberg, 2017).
- **Fragmented policy implementation across institutions.** Although multiple strategies mention innovation, implementation often remains inconsistent, underfunded, or disconnected from the private sector's needs. This mirrors broader regional findings that highlight gaps between strategic aspiration and operational execution (European Training Foundation, 2022).
- **Low levels of private investment.** Albania's startup ecosystem remains heavily dependent on donor and public funding, with limited angel investment or venture capital activity. Comparative studies of emerging economies demonstrate that without private-sector engagement, ecosystems struggle to achieve sustainability and scale (Startup Genome, 2022).
- **Short-term programmatic focus.** Many donor-funded interventions prioritise short-term deliverables—such as training outputs or pilot projects—over long-term capacity-building, ecosystem governance, or private-sector mobilisation. This reflects a common criticism in development literature regarding “projectized” innovation support (UNDP, 2020).

These challenges reveal structural constraints that cannot be resolved by isolated programs, regardless of their quality or scale. Instead, they point to the need for systemic alignment, sustained investment, and stronger governance mechanisms—core features of successful national innovation systems.

Broader Implications

These findings are consistent with the experience of other Western Balkan economies, in which donor dependency, limited domestic financing, and institutional fragmentation impede the development of robust innovation systems. For Albania, achieving greater alignment between donor priorities and national strategies is essential to prevent parallel interventions and to promote coherent ecosystem development.

Ultimately, while donor and state efforts have laid important groundwork, the transition from an emerging to a mature, resilient startup ecosystem will require deeper structural reforms, enhanced coordination, and mechanisms that crowd in private capital and foster long-term capacity for innovation.

6. Conclusion

Donor and state funding have been instrumental in catalysing early-stage entrepreneurial activity in Albania, particularly during a period when domestic financial markets and innovation institutions remain underdeveloped. These interventions have contributed to building essential ecosystem foundations—ranging from digital skills and startup support infrastructure to policy experimentation and increased public awareness of entrepreneurship. In line with research on innovation systems in emerging economies, early-stage public and donor engagement is often necessary to compensate for structural market gaps and the private sector's risk aversion (Mazzucato, 2013; OECD, 2021).

However, the findings of this study indicate that funding alone is insufficient to establish a resilient and self-sustaining startup ecosystem. Sustained ecosystem development requires strong governance structures capable of ensuring policy coherence, institutional coordination, and continuity across electoral cycles and donor programming phases. International evidence shows that successful innovation-driven economies rely not only on financial support but also on stable and well-integrated national innovation systems that facilitate collaboration among government, academia, industry, and civil society (Lundvall, 1992; Nelson, 1993).

For Albania, this underscores the urgency of moving beyond fragmented, project-based approaches toward the creation of long-term strategic frameworks and funding mechanisms—such as innovation funds, co-investment instruments, and regulatory incentives—that can stimulate meaningful private-sector engagement. Encouraging domestic and foreign private investment is particularly critical, as ecosystems that remain dependent on donor financing often struggle to scale innovation, commercialise research, or develop high-growth ventures.

As Albania and the wider Western Balkan region advance toward deeper integration with the European Union, the ability to build a mature, competitive, and innovation-oriented economy will

become increasingly important. EU accession processes place strong emphasis on digital transformation, research and innovation governance, and SME competitiveness, all of which require a more sophisticated and coordinated approach to ecosystem development. Aligning national innovation policies with EU frameworks—including Horizon Europe, the Digital Europe Programme, and Smart Specialisation Strategies—will be essential for enhancing both funding synergies and institutional capacity.

In conclusion, while donor and state interventions have laid the groundwork for entrepreneurial activity in Albania, the next phase of ecosystem evolution will depend on strengthening governance, aligning policies, mobilising private capital, and fostering long-term institutional learning. These measures are crucial for transforming Albania's startup landscape from an emerging ecosystem into a dynamic and sustainable innovation system capable of supporting economic transformation and regional competitiveness in the decades ahead.

References

- Edler, J., & Fagerberg, J. (2017). *Innovation policy: What, why, and how*. Oxford University Press.
- Estrin, S., & Mickiewicz, T. (2011). Entrepreneurship in transition economies: The role of institutions and generational change. *Journal of Comparative Economics*, 39(3), 442–456.
- Lundvall, B.-Å. (1992). *National systems of innovation: Towards a theory of innovation and interactive learning*. Pinter Publishers.
- Mazzucato, M. (2013). *The entrepreneurial state: Debunking public vs. private sector myths*. Anthem Press.
- Nelson, R. R. (Ed.). (1993). *National innovation systems: A comparative analysis*. Oxford University Press.
- Patton, M. Q. (2015). *Qualitative research and evaluation methods* (4th ed.). Sage Publications.
- Edmondson, A. C., & McManus, S. (2007). Methodological fit in management research. *Academy of Management Review*, 32(4), 1155–1179.
- European Commission. (2020). *European Innovation Scoreboard 2020*. Publications Office of the EU.
- NESTA. (2018). *The knowledge economy: Human capital in digital entrepreneurship*. NESTA Research Report.
- Startup Genome. (2022). *Global Startup Ecosystem Report 2022*. Startup Genome.
- European Commission. (2021). *EU4Innovation Western Balkans: Innovation ecosystem assessment*. European Commission DG NEAR.
- European Training Foundation. (2022). *Skills and innovation in the Western Balkans*. ETF Publications.
- OECD. (2021). *The Western Balkans regional competitiveness and innovation report*. OECD Publishing.
- OECD. (2023). *SME Policy Index: Western Balkans and Turkey 2022*. OECD Publishing.

- UNDP. (2020). *Innovation for development: Lessons from UNDP-supported ecosystems*. United Nations Development Programme.
- World Bank. (2022). *Western Balkans regular economic report: Digitalizing economies for growth*. World Bank Group.
- World Bank. (2023). *Rethinking innovation support in emerging economies*. World Bank Policy Research Working Paper Series.
- GIZ. (2022). *Supporting digital transformation and entrepreneurship in Albania*. Deutsche Gesellschaft für Internationale Zusammenarbeit.
- SIDA. (2021). *Inclusive entrepreneurship and innovation in the Western Balkans*. Swedish International Development Cooperation Agency.
- UNDP Albania. (2022). *Youth entrepreneurship and social innovation initiatives*. UNDP Albania Reports.
- EU Delegation to Albania. (2022). *EU assistance for competitiveness, innovation, and SME development in Albania*. EU Delegation Reports.



ESG Implementation in Vietnamese Commercial Banks

Ha Thi Thu Do ¹

¹Doctor, Deputy Head of
Division, Banking Academy of
Vietnam, Vietnam



Corresponding

hadtt@hvn.edu.vn

author:



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This paper examines the current status and challenges of integrating Environmental, Social, and Governance (ESG) principles within Vietnam's banking sector. The study reveals that although major institutions such as Vietcombank, BIDV, VietinBank, and Techcombank have begun adopting ESG-oriented strategies—through green loans, sustainability-linked bonds, and responsible investment initiatives—the overall level of commitment remains modest, with an average ESG score of 1.11 out of 10. Among the three components, Environmental (E) performance is weakest, while Governance (G) demonstrates relatively higher maturity. The paper identifies critical barriers, including the absence of standardised ESG frameworks, limited professional expertise, and inadequate data transparency. Nevertheless, the trend toward ESG adoption is expected to accelerate, driven by investor demand, regulatory encouragement, and international sustainability commitments. The study emphasises that strengthening ESG practices can enhance banks' reputation, attract sustainable investment, and align Vietnam's banking industry with global financial sustainability standards.

KEYWORDS: ESG Implementation, Commercial banks, Sustainable Development.

How to cite: Thu Do, H. T. (2025). ESG Implementation in Vietnamese Commercial Banks. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 297-301). Futurity Research Publishing.
<https://doi.org/10.5281/zenodo.17858185>

Introduction

In recent years, the ESG implementation (Environmental, Social, and Governance) principles have gained significant global attention as financial institutions play a crucial role in promoting sustainable development. The banking sector, in particular, is at the centre of this transformation, as it serves as the primary channel for capital allocation and risk management. In Vietnam, where

economic growth is accelerating and environmental and social challenges are becoming more pressing, the need for ESG integration in commercial banks has become increasingly urgent.

This is supported by recent research indicating that ESG practices increase firms' cumulative abnormal returns (Li et al., 2021) and stock liquidity (Gibson et al., 2021). Nowadays, many stakeholders are concerned about ESG issues and how firms respond to them. ESG factors are increasingly integrated into risk management, performance assessment, and strategic decision-making. Corporations bring all stakeholders closer through improved ESG and greater payouts (Zahid et al., 2023). The need to implement ESG considerations into organisational practices has been increasingly explored (Gabriella, 2023). Thus, the interest in ESG practices and policies has steadily risen (Khamisu and Paluri, 2024; Li et al., 2021).

Despite its significance, ESG implementation in Vietnamese commercial banks remains in its early stages, with varying levels of awareness, adoption, and effectiveness across institutions. There is a lack of systematic research analysing the current state of ESG practices, the challenges banks face, and the potential benefits of adopting ESG frameworks. This study aims to bridge this knowledge gap by providing an in-depth analysis of ESG implementation in commercial banks, identifying key drivers, obstacles, and strategies for successful integration.

In conclusion, the necessity of this research is evident as the banking industry sector undergoes a crucial transition toward sustainability. By examining ESG implementation, this study contributes to the broader discourse on responsible banking, regulatory compliance, and long-term financial resilience. The findings will provide valuable insights for policymakers, financial institutions, and stakeholders, supporting the development of a more sustainable and resilient banking industry.

Research Aim and Research Questions

The overall objective of this study is to examine the current status of ESG (Environmental, Social and Governance) principles development in Vietnamese commercial banks. From that status, the study hopes to provide comprehensive knowledge on how to effectively integrate ESG pain points in the banking sector, contributing to sustainable financial development and long-term economic resilience in Vietnam.

To achieve the objectives, this study will focus on addressing the following research questions:

To achieve the objectives, this study will focus on addressing the following research questions:

- (1) What is the level of ESG implementation at some typical commercial banks in Vietnam?
- (2) What are the trends in ESG implementation at commercial banks in Vietnam? What are the results and limitations?

By addressing these research questions, this study aims to contribute to the broader discourse on sustainable finance and responsible banking, providing valuable insights into the

challenges and opportunities associated with ESG implementation in the Vietnamese banking sector.

Research Results

ESG implementation trend in banking operations in Vietnam

The application of ESG principles in Vietnamese banking operations has been gradually improving, though challenges remain in standardisation and enforcement. Several major Vietnamese banks, including Vietcombank, BIDV, VietinBank, and Techcombank, have started integrating ESG principles into their strategies. These banks have introduced green loans, sustainability-linked bonds, and responsible investment practices to finance environmentally friendly projects and support businesses committed to sustainable development. For example, Vietcombank has pledged to increase its green credit portfolio, prioritising renewable energy projects and businesses that comply with environmental regulations (Nguyen et al., 2023).

However, the lack of standardised ESG reporting frameworks and limited ESG expertise among financial institutions pose significant challenges (Phuong et al., 2024). Many banks still view ESG compliance as a regulatory requirement rather than a strategic initiative, leading to inconsistencies in ESG implementation across the sector. Additionally, the absence of comprehensive ESG data and rating systems makes it difficult for stakeholders to assess banks' sustainability performance objectively (Hoang et al., 2023).

Despite these challenges, the trend toward ESG adoption in Vietnamese banking operations is expected to accelerate in the coming years, driven by increasing investor demand, government incentives, and international commitments to sustainability. The growing emphasis on ESG integration reflects the broader transformation of Vietnam's financial landscape, in which banks are gradually recognising their role in fostering a greener, more socially responsible economy.

Table 1

Average score on the ESG commitment level of 10 commercial banks in Vietnam

No.	Bank name	ESG score	Environment score (E)	Social score (S)	Governance score (G)
1	Agribank	0.99	0.16	1.44	1.10
2	BIDV	0.93	0.16	1.34	1.00
3	Eximbank	0.90	0.00	0.86	1.60
4	LPBank	1.19	0.00	1.26	2.00
5	MSB	1.05	0.16	1.42	1.30
6	Teckcombank	0.76	0.16	0.77	1.20

7	VIB	1.04	0.16	0.72	2.10
8	Vietcombank	0.73	0.16	0.62	1.30
9	VietinBank	1.01	0.16	1.16	1.50
10	VPBank	2.52	1.52	2.95	2.70
Average		1.11	0.26	1.25	1.58

Source: FFV (2020)

The data on ESG scores of 10 commercial banks in Vietnam reveals that the overall level of ESG commitment remains relatively low, with an average score of 1.11 out of a possible 10. Among the three ESG components, the Environmental (E) score is the weakest, averaging only 0.26, suggesting that banks have not prioritised environmental sustainability. The Social (S) score is slightly higher at 1.25, while the Governance (G) score is the strongest at 1.58, indicating that banks tend to focus more on corporate governance than on environmental or social factors.

There are also notable differences among banks. VPBank stands out with the highest ESG score of 2.52, particularly excelling in environmental initiatives with an E score of 1.52. At the same time, banks such as Eximbank, Vietcombank, and BIDV have ESG scores below 1, reflecting a relatively low level of commitment. A clear trend emerges in which banks emphasise governance over environmental concerns, with most environmental scores being as low as 0.16 or even 0.00. This highlights a gap in sustainable banking practices in Vietnam.

In conclusion, while governance efforts are more developed, Vietnamese commercial banks have significant room for improvement, particularly in addressing environmental sustainability. Strengthening ESG commitments can enhance their reputation, attract investors, and align them with global sustainable finance standards.

Conclusions

This research provides an in-depth analysis of the current status of ESG implementation in the operations of Vietnamese commercial banks. The implementation of ESG principles in Vietnamese commercial banks has been gaining momentum, reflecting the growing awareness of sustainable banking practices. The Vietnamese banking sector is undergoing significant structural and regulatory transformations, with strong government and regulatory guidance to align with global ESG trends. Various ESG frameworks, policies, and essential documents have been introduced to facilitate the adoption of ESG principles, though challenges remain in their full application across all banks. In terms of environmental factors, green credit has emerged as a key driver of sustainability in the banking industry. While some banks have actively promoted green financing and sustainable investments, the overall implementation remains uneven.

Regarding social factors, many commercial banks are prioritising financial inclusion as they expand banking services to underserved populations. However, disparities exist among banks. For

governance, ESG disclosure and transparency have improved over time, but there are still gaps in reporting standards and accountability.

A general assessment of ESG implementation in Vietnamese commercial banks highlights several achievements, including increased awareness, government support, and initial steps in green finance and financial inclusion. Looking ahead, Vietnamese banks have significant opportunities to strengthen their ESG strategies, particularly through international partnerships, regulatory incentives, and technological advancements. Nonetheless, they also face challenges, including capital constraints, regulatory uncertainties, and the need for a skilled workforce capable of integrating ESG effectively into banking operations.

References

- Fair Finance Vietnam (2023). Environmental - Social - Governance (ESG) commitments in the Banking sector: Overview and Case Studies of 10 Vietnamese Commercial Banks in 2022, Toward Sustainable Finance.
- Gabriella Alodia Jovita (2023). 'Impact of ESG Implementation on Financial Performance and Capital Structure', *Journal Informatika Ekonomi Bisnis*.
- Gibson Brandon, Rajna, Krueger,Philipp, Peter Steffen and Schmidt. 2021. 'ESG Rating Disagreement and Stock Returns'. *Financial Analysts Journal* 77 (4): 104-27.
<https://doi.org/10.1080/0015198X.2021.1963186>.
- Hoang, Thi Hong Van, Linh Pham, and Thanh Thi Phuong Nguyen. 2023. 'Does Country Sustainability Improve Firm ESG Reporting Transparency? The Moderating Role of Firm Industry and CSR Engagement'. *Economic Modelling* 125 (August):106351.
<https://doi.org/10.1016/j.econmod.2023.106351>.
- JPMorgan Chase. (2021). Sustainable Investment Commitment Report. 79
- Khamisu, Muhammad Sani, Ratna Achuta Paluri, and Vandana Sonwaney. 2024. 'Stakeholders' Perspectives on Critical Success Factors for Environmental Social and Governance (ESG) Implementation'. *Journal of Environmental Management* 365 (August):121583.
<https://doi.org/10.1016/j.jenvman.2024.121583>.
- Li, Zengfu, Liuhua Feng, Zheng Pan, and Hafiz M. Sohail. 2022. 'ESG Performance and Stock Prices: Evidence from the COVID-19 Outbreak in China'. *Humanities and Social Sciences Communications* 9 (1): 1-10.
<https://doi.org/10.1057/s41599-022-01259-5>.
- Li, T.-T.; Wang, K. Sueyoshi, T.; Wang, D.D (2021). ESG: Research Progress and Future Prospects. *Sustainability* 2021, 13, 11663. <https://doi.org/10.3390/su132111663>.
- Phuong, Minh, Anh, Ly and Ha (2024). Impact of ESG information disclosure on profitability of Vietnamese commercial banks.
- Zahid, Muhammad, Naqvi ,Syeda Um-Ul-Baneen, Jan ,Amin, Rahman ,Haseeb Ur, and Said and Wali. 2023. 'The Nexus of Environmental, Social, and Governance Practices with the Financial Performance of Banks: A Comparative Analysis for the Pre and COVID-19 Periods'. *Cogent Economics & Finance* 11 (1): 2183654. <https://doi.org/10.1080/23322039.2023.2183654>.

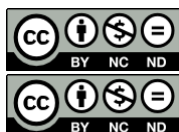


Authentication of Electronic Evidence Derived from Digital Transactions and Communications

Nguyen Thanh Minh Chanh ¹

¹ PhD in Law Candidate at Ho Chi Minh City University of Economics and Finance.
Lecturer at Industrial University of Ho Chi Minh City, Vietnam

✉ **Corresponding author:**
nguyenthanhminhchanh@iuh.edu.vn.



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: The rapid advancement of digital technologies, artificial intelligence, and blockchain has profoundly transformed how information is generated, exchanged, and utilised in commercial transactions. This evolution raises urgent legal and technical challenges regarding the authentication of electronic evidence, which is crucial to ensuring the integrity, reliability, and probative value of digital data in judicial and arbitral proceedings. This paper examines the theoretical foundations and practical challenges of authenticating electronic evidence derived from digital transactions and communications in Vietnam. Through comparative analysis of legal frameworks in Singapore, the United States, and the European Union, the study identifies Vietnam's lack of integration between legal provisions and technical standards as the main obstacle to effective authentication. The research proposes a series of reforms, including establishing authentication mechanisms for specific digital transactions, creating a trusted third-party verification system, regulating the chain of custody, institutionalising a national digital forensic centre, and promoting capacity building through public-private partnerships. The findings highlight that improving Vietnam's legal and technical framework for the authentication of electronic evidence is essential not only for procedural fairness and legal certainty but also for fostering a transparent and trustworthy digital economy.

KEYWORDS: Electronic evidence; Authentication; Blockchain; Digital data; Vietnam.

How to cite: Minh Chanh, N. T. (2025). Authentication of Electronic Evidence Derived from Digital Transactions and Communications. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 302-309). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17926441>

Introduction

In the digital era, commercial, financial, and administrative activities are increasingly conducted through online platforms, resulting in the proliferation of electronic data in the form of contracts, emails, messages and social media content. These digital records have become vital sources of evidence in civil and commercial dispute resolution. However, the inherent characteristics of electronic data, such as its ease of duplication, modification, and deletion, pose significant challenges for determining authenticity, reliability, and evidentiary value in legal proceedings (Nguyen Thanh Minh Chanh, 2021; Tran, 2022). The key issue in contemporary litigation and arbitration is therefore not whether to accept electronic evidence but how to authenticate it in a manner that ensures legal validity and probative force.

The authentication of electronic evidence is a dual challenge that lies at the intersection of law and technology. It requires both legal mechanisms to establish the evidentiary status of digital data and technical tools to verify its integrity and origin. Many jurisdictions, such as Singapore, the United States and the European Union, have developed sophisticated frameworks that combine legal rules with technical standards such as digital signatures, hash functions, timestamps and blockchain to maintain a secure chain of custody (Wu & Zheng, 2020),(Al-E'mari et al., 2024), (Xiao et al., 2024). By contrast, Vietnam's legal framework remains at a foundational stage. However, the *Civil Procedure Code* 2015 and the *Law on Electronic Transactions* 2023 recognise the legal validity of data messages and electronic documents; they lack detailed guidance on technical authentication, digital forensics and procedural verification (Civil Procedure Code, 2015; Law on Electronic Transactions, 2023).

Research Aim

This study aims to examine the theoretical foundations, international practices, and practical challenges related to the authentication of electronic evidence derived from digital transactions and communications in Vietnam. By comparing Vietnam's legal framework with those of advanced jurisdictions such as Singapore, the United States, and the European Union, the research seeks to propose legal and technical reforms to ensure that electronic evidence is of consistent integrity, authenticity, and probative value, in line with international standards. The goal is to contribute to the modernisation of Vietnam's judicial system and enhance the transparency and reliability of dispute resolution in the digital era.

To achieve this objective, the study addresses the following three research questions:

1. How is the authentication of electronic evidence understood in the context of rapidly developing digital data and technology?
2. What technical and legal mechanisms are employed in advanced countries for the authentication of electronic evidence?
3. What provisions does Vietnam need to add or improve to ensure the legal value and feasibility of authenticating electronic evidence?

Results and Discussion

In the context of global digital transformation, digital transactions and information exchanges are increasingly becoming the foundational platform for business and commercial relations in Vietnam. As a result, electronic evidence formed from digital data and interactions in online environments has become central in modern dispute resolution. However, the most complex legal issue today is not whether to “accept” electronic evidence but how to “authenticate” it, verifying the integrity, origin, and authenticity of the data. This challenge is not merely technical but requires coordination between law and technology to ensure the probative value of electronic information (Nguyen Thanh Minh Chanh, 2021; Tran, 2022).

From a theoretical perspective

Electronic evidence has legal value only if it is secured through both legal and technical measures, particularly by demonstrating the integrity and origin of the data (Mason & Seng, 2017). This view is supported by Ferreira & Gromova, who emphasise that, in arbitration proceedings, authentication of electronic evidence must be supported by technologies such as encryption, digital signatures, or blockchain to protect the original data and guard against fraud (Ferreira & Gromova, 2023). From a broader perspective, blockchain, hash functions, and metadata may become core tools in maintaining a chain of custody – a factor that ensures data is not altered during collection and use (Rahul et al., 2024; Wu & Zheng, 2020). Additionally, because electronic evidence is easily copied and altered, it cannot be authenticated by the senses as traditional physical evidence can; instead, it must be verified through “digital traces” such as access logs, access-control systems, and digital forensic evidence. This view opens a new approach: authentication of electronic evidence is not simply a technological procedure but an essential component of a modern procedural mechanism, requiring that law keep pace with technical advances (Xiao et al., 2024; Al-E’mari et al., 2024).

In Vietnam, the law has so far only recognised the legal value of electronic data, without establishing technical norms for authentication. Although Article 94 of the Civil Procedure Code 2015 (Civil Procedure Code, 2015), which included electronic data as admissible evidence, also addresses data messages and electronic records, the Law on Electronic Transactions 2023 addresses them. Article 11 provides that: “*A data message shall not be denied legal effect, validity or enforceability solely because it is in electronic form. Its evidentiary value is determined based on its reliability, methods of generation, storage, transmission and the ability to maintain its integrity and identify its origin*” (Law on Electronic Transactions, 2023). The law recognises the legal value of electronic data and digital signatures; their provisions remain at a principled level, lacking specific technical guidance on authentication. However, this insufficiency leads to many difficulties when the lack of digital forensic tools forces the bench to rely on witness testimony rather than technical evidence. These instances clearly reflect that Vietnam’s judiciary still lacks a chain of custody and an independent data verification process (Nguyen Thanh Minh Chanh, 2021; Tran, 2022).

From international experience, many advanced jurisdictions have established close coordination between legal rules and technical standards to ensure the authenticity of electronic data. In the United States, courts are increasingly recognising the probative value of social media data and digital platform content, while warning of risks of manipulation or deletion. Proposals include using timestamping and blockchain to enhance the reliability of evidence (Wang et al., 2024). Similarly, in Europe, cases involving social networks show that although jurisprudence is evolving, challenges regarding the authenticity of digital data persist (Psychogiopoulou, 2021). In Asia, Singapore is seen as a leading example of combining legal regulation with technical authentication, allowing courts to verify messages, emails, or OTT data through service provider confirmation. This mechanism ensures data integrity and authenticity and significantly shortens litigation time (Seng, 2024). These instances clearly show that Vietnam can draw on such experience to improve its legal framework.

From Practical Context

In Vietnam's commercial dispute resolution practice, the authentication of electronic evidence remains a significant challenge for both courts and arbitral tribunals. Despite the Civil Procedure Code 2015 and the Law on Electronic Transactions 2023 acknowledging the legal effect of data messages, electronic signatures, and digital documents (Civil Procedure Code, 2015), (Law on Electronic Transactions, 2023), these provisions remain largely principled and lack specific procedural guidance on authentication, collection, preservation and digital forensic examination (Nguyen Thanh Minh Chanh, 2021), (Tran, 2022).

Judicial practice reveals that many cases are delayed or dismissed due to insufficient verification of the origin or integrity of digital data. In a "loan contract dispute", for example, the People's Court of Binh Xuyen District (TAND huyện Bình Xuyên, 2024). refused to admit printed Zalo messages as evidence because of the absence of digital forensic tools, compelling the court to rely on oral testimony instead of technical proof. This highlights the absence of a clearly defined chain of custody to ensure authenticity during data collection, storage, and presentation. Vietnam also lacks an independent digital forensic authority with a mandate to assist courts and arbitration tribunals in analysing, recovering, or authenticating electronic evidence (Nguyen Thanh Minh Chanh, 2021; Tran, 2022).

Compared to advanced jurisdictions, Vietnam's legal framework still lacks effective integration between legal provisions and technical standards governing the authentication of electronic evidence. In contrast, Singapore has established a detailed and coherent regime under its Evidence Act (1983) (Singapore Parliament, 1983) and Electronic Transactions Act (2010) (Singapore Parliament, 2010). *Section 9 of the Evidence Act mandates proof of "the integrity of the data storage system" as a condition for establishing authenticity.* Furthermore, Singapore's legal practice permits network service providers and digital platforms to verify essential metadata, such as the sender's identity, transmission time, and IP address, in civil and commercial disputes, ensuring the technical traceability of digital evidence (Seng, 2024).

In the United States, the Federal Rules of Evidence (Rules 901 and 902) (13), (14) explicitly address the authentication of electronic evidence (Federal Rules of Evidence, 2024). Under these provisions, electronic evidence may be deemed self-authenticating if accompanied by a valid technical certification, such as verified copies with a hash value, metadata or confirmation by a system administrator. U.S. courts also accept digital forensic reports as independent proof of authenticity and origin (Wang et al., 2024).

In the European Union (EU), the eIDAS Regulation (European Union, 2014) establishes a unified framework for electronic identification and trust services. Under this regime, digital signatures, timestamps, and electronic seals (e-seals) carry the same legal effect as handwritten signatures and are mutually recognised across all Member States, thereby ensuring both the legal validity and technical verifiability of electronic data (Psychogiopoulou, 2021; Stoykova, 2021).

In contrast, Vietnam's system remains fragmented and essentially principle-based. Unlike Singapore, the United States, and the EU—where mandatory technical standards such as hash verification, timestamping, and chain-of-custody procedures are clearly defined—Vietnam has yet to codify comparable procedures. As a result, the assessment of electronic evidence in Vietnam often depends on judicial discretion rather than objective technical criteria, which undermines consistency, predictability and transparency in adjudication (Nguyen Thanh Minh Chanh, 2021; Tran, 2022).

Recommendations for Improving the Vietnamese Law on the Authentication of Electronic Evidence Derived from Digital Transactions and Communications

In the context of a rapidly developing digital economy, online transactions and communications (such as emails, OTT applications, e-commerce platforms, electronic contracts, and blockchain-based exchanges) have increasingly become the primary sources of evidence in the resolution of commercial disputes. However, Vietnamese law currently stops at recognising the legal validity of data messages, without establishing a coherent, scientific, and internationally standardised mechanism for authenticating electronic evidence originating from digital transactions and communications. Therefore, it is necessary to improve the law in the following directions.

Establishing Authentication Mechanisms for Specific Types of Digital Transactions

Vietnam should develop specific authentication mechanisms suited to various types of digital transactions and communication platforms—such as email, OTT messaging applications (e.g., Zalo, Viber), e-commerce exchanges, and electronic contracts. These mechanisms must clearly define the source and method of data collection, identify both the sender and recipient, and record essential metadata such as IP addresses, timestamps, and hash values. Such technical specifications are crucial for ensuring data integrity, authenticity and traceability throughout the transaction process.

Vietnam may refer to the Singaporean model [Evidence Act (Cap. 97, Revised Edition)] (Singapore Parliament, 1983), which requires proof of “the integrity of the data storage system” as a condition for authenticating electronic information generated from digital transactions.

Legal Framework for Trusted Third-Party Authentication

A comprehensive legal framework should be established to enable the authentication of electronic evidence through trusted third parties. These entities may include electronic certification authorities, telecommunications service providers, or licensed online transaction platforms that are authorised to verify the identity of parties, the transmission time, and the integrity of content.

The European Union's Regulation (EU) No. 910/2014 (eIDAS) provides a valuable reference, as it ensures the cross-border legal recognition of electronic signatures, timestamps and seals, thereby reinforcing transparency and technical verifiability. This framework grants digital evidence the same legal status as traditional paper-based documents, promoting trust and legal certainty in digital environments (European Union, 2014).

Regulation of the Chain of Custody for Electronic Evidence

Vietnam should promulgate detailed regulations governing the chain of custody for electronic evidence derived from digital transactions and communications. These regulations should encompass all procedural stages from recording, storage and transfer to verification and presentation—under the supervision of judicial authorities or independent digital forensic institutions. To ensure consistency with international best practices, Vietnam should adopt ISO/IEC 27037:2012, which provides standardised guidelines for the collection, preservation, and handling of digital evidence. This approach guarantees that the integrity and reliability of data are maintained throughout the entire evidentiary process (ISO, 2012).

Establishment of a Digital Forensic Centre for Civil and Commercial Matters

Vietnam should consider creating a Digital Forensic Centre for Civil and Commercial Matters to assist courts and arbitral tribunals in authenticating electronic evidence arising from digital transactions and communications. This specialised centre should be empowered to collaborate with network service providers, e-commerce platforms, and technology enterprises to verify data origins, retrieve deleted files, and analyse metadata.

The United States model, in which digital forensic reports are treated as self-authenticating evidence under Federal Rules of Evidence 901 and 902(13), (14) (2024), demonstrates the effectiveness of institutionalising forensic expertise within the evidentiary system (Federal Rules of Evidence, 2024).

Capacity Building and Public-Private Partnerships

To ensure effective implementation, Vietnam should invest in capacity building by organising specialised training programs on the authentication of electronic evidence for judges, arbitrators, prosecutors, and legal practitioners.

Simultaneously, public-private partnerships (PPPs) should be encouraged between judicial authorities and major technology companies (e.g., Meta, Google, Zalo, Shopee, Tiki) to develop

standardised procedures for data provision, sender-recipient verification, and timestamp confirmation. These partnerships must also prioritise privacy protection and data security, ensuring that evidentiary authentication aligns with both technological realities and legal safeguards.

Conclusion

The authentication of electronic evidence derived from digital transactions and communications has become a pivotal aspect of Vietnam's legal modernisation. Despite the Civil Procedure Code (2015) and the Law on Electronic Transactions (2023) establishing foundational principles recognising the legal validity of data messages, electronic signatures, and digital documents, the absence of detailed procedural and technical standards continues to hinder their effective implementation. In contrast, jurisdictions such as Singapore, the United States, and the European Union have developed comprehensive legal-technical frameworks that integrate mechanisms such as hash verification, timestamping, and chain-of-custody procedures with legal presumptions of authenticity, thereby ensuring the reliability and admissibility of digital evidence in judicial and arbitral proceedings. Vietnam, however, remains at an early stage of this development due to the lack of an independent digital forensic authority, inconsistent judicial assessment of electronic evidence and limited cooperation between judicial institutions and digital service providers. To overcome these challenges, Vietnam should urgently standardise the authentication process in line with international best practices by adopting clear regulations on the chain of custody, incorporating ISO/IEC standards for digital evidence collection and preservation, and recognising trusted third parties as legitimate authenticators. Additionally, reestablishing a national digital forensic centre and enhancing digital literacy among judges, arbitrators, and legal practitioners are essential to ensuring objective, scientific, and globally aligned evaluations of electronic evidence. Ultimately, the authentication of electronic evidence from digital transactions and communications is not merely a technical issue but a crucial step toward establishing a transparent, reliable, and innovation-driven legal foundation for Vietnam's digital economy.

References

- Al-E'mari, S., Sanjalawe, Y., Makhadmeh, S., & Alqudah, H. (2024). Digital Forensics Meets Blockchain: Enhancing the Authenticity and Traceability of Evidence. *2024 2nd International Conference on Cyber Resilience (ICCR)*, 01-06. <https://doi.org/10.1109/ICCR61006.2024.10532961>
- Civil Procedure Code (2015).
- European Union. (2014). *REGULATION (EU) No 910/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL.*
- Federal Rules of Evidence (2024).
- Ferreira, D. B., & Gromova, E. A. (2023). Electronic evidence in arbitration proceedings. *Digital Evidence and Electronic Signature Law Review*, 30-39.

- <https://doi.org/10.14296/deeslr.v20i.5608>
- ISO. (2012). *Information technology-Security techniques-Guidelines for identification, collection, acquisition, and preservation of digital evidence*.
- Law on Electronic Transactions, Pub. L. No. No. 20/2023/QH15, National Assembly (2023).
- Mason, S., & Seng, D. (2017). *Electronic Evidence*.
- Nguyen Thanh Minh Chanh. (2021). *Pháp luật về chứng cứ điện tử trong tố tụng dân sự Việt Nam*. <http://lapphap.vn>
- Psychogiopoulou, E. (2021). Judicial dialogue in social media cases in europe: Exploring the role of peers in judicial adjudication. In *German Law Journal* (Vol. 22, Issue 6, pp. 915-935). Cambridge University Press. <https://doi.org/10.1017/glj.2021.57>
- Rahul, M., Bharati, K., Khodke, P. G., Khadilkar, C. P., & Bawiskar, S. K. (2024). Forensic Bytes: Admissibility and Challenges of Digital Evidence in Legal Proceedings. *International Journal of Scientific Research in Science and Technology (Www.Ijsrst.Com)* |, 11(16), 24-35. <https://doi.org/10.32628/IJSRST>
- Seng, D. K. B. (2024). *Electronic Evidence*. <https://doi.org/10.2139/ssrn.4964150>
- Singapore Parliament. (1983). *Evidence Act 1893 and 2020 revised edition*.
- Singapore Parliament. (2010). *ELECTRONIC TRANSACTIONS ACT 2010 2020 REVISED EDITION*.
- Stoykova, R. (2021). Digital evidence: Unaddressed threats to fairness and the presumption of innocence. *Computer Law & Security Review*, 42, 105575. <https://doi.org/10.1016/j.clsr.2021.105575>
- TAND huyện Bình Xuyên, tỉnh V. P. (2024). *Tranh chấp hợp đồng vay tài sản [Property loan contract dispute]*.
- Tran, Q. A. (2022). *Electronic Evidence in Civil and Commercial Dispute Resolution* (Vol. 27). Springer Nature Switzerland. <https://doi.org/10.1007/978-3-031-18572-4>
- Wang, X., Wu, Y. C., & Ma, Z. (2024). Blockchain in the courtroom: exploring its evidentiary significance and procedural implications in U.S. judicial processes. *Frontiers in Blockchain*, 7. <https://doi.org/10.3389/fbloc.2024.1306058>
- Wu, H., & Zheng, G. (2020). Electronic evidence in the blockchain era: New rules on authenticity and integrity. *Computer Law and Security Review*, 36. <https://doi.org/10.1016/j.clsr.2020.105401>
- Xiao, N., Wang, Z., Sun, X., & Miao, J. (2024). A novel blockchain-based digital forensics framework for preserving evidence and enabling investigation in industrial Internet of Things. *Alexandria Engineering Journal*, 86, 631-643. <https://doi.org/10.1016/j.aej.2023.12.021>



The Legal Framework on Time Limits for Pre-Trial Preparation in Commercial Cases in Vietnam: Current Situation and Reform Directions

Nguyen Thanh Minh Chanh¹, Dang Thi Minh Phuong^{2*}

¹ PhD in Law Candidate at Tra Vinh University, Faculty of Law and Political Sciences, Industrial University of Ho Chi Minh City, Vietnam

² Doctor, Faculty of Law and Political Sciences, Industrial University of Ho Chi Minh City, Vietnam



***Corresponding author:**

dangthminhphuong@iuh.edu



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: Procedural deadlines serve as an essential safeguard to balance efficiency and fairness in judicial adjudication. In Vietnam, the legal framework governing time limits for pre-trial preparation in commercial cases is primarily set out in Article 203 of the Civil Procedure Code 2015. However, ambiguities regarding the commencement and expiration of the preparation period, coupled with unclear criteria for extensions, have led to inconsistent judicial practice and widespread delays. This article examines the statutory framework, analyses practical challenges through case law and judicial practice, and provides comparative insights from France, Japan, and Russia. It argues that the current regime remains overly rigid, lacking sufficient flexibility to address the complexity of commercial disputes, while also leaving significant gaps that undermine legal certainty. The paper concludes by proposing legislative reform to extend preparation periods, clarify the grounds for extension, and strengthen judicial accountability and oversight mechanisms. These reforms aim to enhance both the timeliness and fairness of commercial adjudication in Vietnam.

KEYWORDS: Pre -trial preparation; Commercial disputes; Procedural deadlines; Judicial efficiency; Vietnam.

How to cite: Minh Chanh, N. T., & Minh Phuong, D. T. (2025). The Legal Framework on Time Limits for Pre-Trial Preparation in Commercial Cases in Vietnam: Current Situation and Reform Directions. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 310-317). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17926532>

Introduction

Procedural time limits constitute a cornerstone of civil justice, ensuring that cases are resolved within a reasonable period while safeguarding litigants' rights to a fair trial. In commercial disputes, where legal certainty and business continuity are paramount, delayed proceedings impose significant economic and social costs. Excessive prolongation of pre-trial preparation undermines enterprises' confidence in judicial institutions, discourages investment, and disrupts the stability of commercial relations. Conversely, overly rigid deadlines may constrain fact-finding, impede thorough consideration of evidence, and jeopardise fairness (Hà Viết Toàn, 2022).

In Vietnam, the legal framework on trial preparation time limits for commercial cases is primarily codified in the Civil Procedure Code (Civil Procedure Code, 2015). While the Code sets out statutory deadlines, numerous interpretive and practical issues have emerged. Courts struggle with determining the precise commencement and expiration of the preparation period, particularly in cases involving counterclaims or supplementary claims (Tạ Huyền Trang, 2019; Đoàn Thị Mai, 2023). Provisions on extensions remain vague, lacking clear definitions of "complex cases" or "objective obstacles." As a result, inconsistent application and unjustified delays remain widespread, often stretching proceedings beyond statutory limits without accountability (Trần Thăng Long, 2022).

Against this backdrop, this article undertakes a doctrinal and comparative analysis of Vietnam's current regime. It highlights the interpretive ambiguities and enforcement deficiencies in practice, examines comparative experiences from selected jurisdictions such as France (Republic of France, n.d.), Japan (Port, 2002) and Russia (Russian Federation, 2002), and proposes reform directions. The overarching objective is to strike a more effective balance between efficiency and fairness in the adjudication of commercial disputes, thereby strengthening judicial credibility and protecting the legitimate rights and interests of the parties (Ngô Văn Hiệp, 2022).

Research Aim

This study aims to provide a comprehensive analysis of the framework on time limits for pre-trial preparation in commercial cases in Vietnam, to enhance the credibility of the judiciary and foster a more favourable environment for commercial activities and economic development.

Research Questions

1. How does the current legal framework on time limits for pre - trial preparation in commercial cases under the Vietnamese Civil Procedure Code 2015 ensure or fail to ensure efficiency and fairness in adjudication?
2. What practical challenges arise in determining the commencement, expiration, and extension of trial preparation periods in Vietnamese courts, and how do these challenges affect the consistency of judicial practice?
3. What lessons can Vietnam draw from comparative approaches in other jurisdictions, and what

reforms are needed to improve the clarity, flexibility, and enforceability of time-limit regulations in commercial adjudication?

Results and Discussion

Article 203 of the Civil Procedure Code 2015 establishes a two-month preparation period for the pre-trial of commercial cases, extendable once for up to one month in cases deemed complex or where objective obstacles exist (Civil Procedure Code, 2015). Within this period, judges are required to issue one of four possible decisions: (i) recognition of the parties' settlement, (ii) suspension of proceedings, (iii) termination of proceedings, or (iv) a decision to bring the case to trial. Following such decisions, the trial must be held within one month, or two months in exceptional circumstances.

The statutory framework requires clarification of both the commencement date and expiration date of the preparation period. According to Article 203 (Civil Procedure Code, 2015), the preparation period begins from the date the court accepts the case. However, in practice, determining this commencement date is complicated by procedural issues such as counterclaims, independent claims, or supplementary claims, all of which can significantly alter the scope of adjudication. This ambiguity underscores the importance of legislative guidance to ensure transparency, consistency, and predictability in trial preparation (Tạ Huyền Trang, 2019).

Practical Challenges

Commencement of the Period

Under Article 203 of the Civil Procedure Code, the preparation period is calculated from the date the court accepts the case (Civil Procedure Code, 2015). This period is calculated from the date the court "accepts" the case, which in practice depends on procedural steps: if the plaintiff is not exempted, the acceptance date is the day the court receives the advance court fee receipt; if exempted, it is the day the court receives the statement of claim together with supporting documents and evidence (Hà Viết Toàn, 2022). In line with the general rules for procedural time calculation, counting does not begin on the acceptance date itself. Still, on the following working day, and if the final day falls on a weekend or public holiday, the deadline is extended to the next working day (National Assembly, 2015). Practical difficulties arise, however, when defendants submit counterclaims or when independent or supplementary claims are introduced. These additional claims broaden the scope of legal relationships to be adjudicated, raising the question of whether the time limit should be recalculated. Resolution No. 05/2012/NQ-HĐTP of the Supreme People's Court, though no longer in force since 2023, once clarified that the preparation period should only commence after the completion of all procedural requirements for such claims, a principle still regarded as logically and practically sound. In the absence of explicit legislative guidance in the Civil Procedure Code 2015, inconsistent judicial practice persists, thereby underscoring the need for a new resolution to codify this principle (Đoàn Thị Mai, 2023).

Evidence of this issue can be seen in a case where, on April 25, 2024, Mr Nguyen A filed a lawsuit against Ms Le C before the People's Court of District X regarding a "Contract for the Sale of Goods" involving agricultural products for export with a contract value of VND 1 billion. The Court formally accepted the case on May 5, 2024, pursuant to Notice No. 05/2024/TB-Acceptance, and within the statutory preparation period, conducted procedural activities such as taking testimonies and collecting evidence. On May 20, 2024, the plaintiff submitted a supplementary claim seeking an additional payment of VND 200 million, which the Court accepted on May 30, 2024, under Notice No. 234/2024/TB-Court, thereby increasing the total claim to VND 1.2 billion. Following two unsuccessful mediation sessions on June 5 and June 16, the Court brought the case to trial on July 26, 2024. This factual scenario gave rise to two opposing interpretations of the time limit for first-instance trial preparation: one view holds that the statutory period should be recalculated from the date the supplementary claim was accepted, meaning the case remained within the lawful timeframe as of July 26; the other view maintains that the Civil Procedure Code provides no basis for recalculation, so the time limit should have been counted from May 5, rendering the July 26 trial a violation of procedural deadlines (Trần Thăng Long, 2022).

In evaluating these divergent perspectives, it is arguable that the first view, which supports recalculating the time limit for trial preparation from the date the court accepts the supplemental claim, reflects an effort to preserve fairness in adversarial proceedings. The rationale is that when the scope or value of the dispute changes, additional procedural steps, such as renewed evidence-gathering, conciliation attempts, and procedural adjustments, may be necessary to safeguard the litigants' legitimate rights and interests. Nevertheless, this interpretation encounters significant limitations: the Civil Procedure Code 2015 contains no provision expressly authorising such recalculation. Article 203 (Civil Procedure Code, 2015) stipulates a fixed two-month preparation period, extendable by only one month, calculated strictly from the date of initial acceptance, without exceptions for amendments or supplements to the claim. From a doctrinal standpoint, the second view therefore appears more consistent with the principle of procedural certainty and the legislative intent of ensuring stability and predictability in adjudication. Yet, the absence of explicit regulation creates a lacuna that may lead to inconsistent judicial practice and potential procedural disputes. To address this, legislative reform is warranted, specifically an amendment to the CPC that provides clear rules on how preparation periods should be treated in cases involving supplemental claims. Such clarification would not only enhance legal transparency but also better protect the procedural rights of disputing parties.

Expiration of the Period

Another contentious issue concerns the determination of the expiration of the preparation period. One interpretation holds that the period concludes when the judge issues one of the four decisions set out in Article 203(3) of the Civil Procedure Code (2015). Another interpretation holds that the period ends only when the trial formally opens. The former view is more persuasive, as the post-decision phase is primarily administrative, such as issuing summonses and logistical arrangements and thus should not

be considered part of the preparation stage (Hà Viết Toàn, 2022), (Đoàn Thị Mai, 2023). Clarifying this distinction is crucial for legal certainty and procedural consistency.

Extension Mechanism

The Civil Procedure Code 2015 permits an extension of up to one month in cases deemed complex or subject to objective obstacles. Still, it provides no statutory definition or criteria for identifying such circumstances (Civil Procedure Code, 2015). In practice, many commercial cases far exceed statutory limits, with the preparation stages lasting several months or even years, undermining both efficiency and legal certainty (Ngô Văn Hiệp, 2022). Comparative experiences reveal diverse approaches to balancing certainty and flexibility in trial preparation. In France, judges enjoy broad discretion to set deadlines based on case complexity and urgency, ensuring procedural adaptability (Republic of France, n.d.). In Japan, courts may extend or shorten deadlines but must respect certain immutable periods to safeguard stability (Port, 2002). Russia, meanwhile, prescribes short statutory limits but provides judges with flexibility to accommodate case-specific circumstances (Russian Federation, 2002).

These models illustrate the fundamental trade-off between two imperatives: legal certainty through fixed deadlines and judicial flexibility to adapt to the complexity of disputes. Vietnam's current framework tends toward rigidity, lacking sufficient guidance to reconcile efficiency with fairness (Tạ Huyền Trang, 2019; Hà Viết Toàn, 2022; Đoàn Thị Mai, 2023). As such, reform is necessary to introduce clearer criteria for extensions, better definitions of complexity, and mechanisms to ensure consistency across courts (Ngô Văn Hiệp, 2022; Trần Thắng Long, 2022).

This issue can be seen in the dispute over a service contract between Company D Ltd. and Company D1 Ltd., where the Notice of Acceptance of the Case No. 194/2023/TLST-Commercial dated October 17, 2023, was followed only by the Decision to Bring the Case to Trial No. 9896/2024/QĐXXST-Commercial on June 20, 2024 (*Bản án số 168/2024/KDTM-ST ngày 26/7/2024 về việc "Tranh chấp hợp đồng dịch vụ"* [Judgment No. 168/2024/KDTM-ST dated July 26, 2024 on "Service contract dispute"], 2024). Thus, the first-instance proceedings in this case extended for more than six months. An even more significant delay occurred in the dispute between Commercial Bank V and Electronics Company NH Ltd., in which the Notice of Acceptance No. 66/2022/TLST-Commercial was issued on November 2, 2022, but the Decision to Bring the Case to Trial No. 89/2024/QĐXXST-Commercial was not rendered until September 16, 2024 nearly two years later (*Bản án số 89/2024/KDTM-ST ngày 16/9/2024 về việc "Tranh chấp hợp đồng dịch vụ"* [Judgment No. 89/2024/KDTM-ST dated September 16, 2024 on "Service contract dispute"], 2024). Although the trial preparation periods in both cases clearly exceeded the statutory limit, the Procuracy in its opinions on both judgments concluded that the courts had complied with procedural law (Trương Thị Diễm My, 2020). This demonstrates that first-instance proceedings can be repeatedly extended or suspended, resulting in prolonged trial preparation periods. Consequently, while under the Civil Procedure Code, the duration of trial preparation in commercial cases is expected to last from three to five months (including extensions), in practice, such cases are often significantly

prolonged and rarely resolved within the statutory time frame (Ngô Văn Hiệp, 2022).

Recommendations for Legal Reform

The legal framework governing the time limits for resolving commercial cases in Vietnam is relatively comprehensive. Nevertheless, delays in adjudicating such cases in the courts remain widespread, often without justification. These delays reveal significant shortcomings in the implementation process. Prolonged proceedings not only undermine the lawful rights and interests of the parties but also impose substantial costs in terms of time, effort, and financial resources. Moreover, frequent appeals and protests of court decisions lead to repeated hearings, further prolonging proceedings and adversely affecting enterprises' business operations.

To enhance the effectiveness of pre-trial preparation and adjudication of commercial cases in the future, the following measures should be adopted:

First, it is necessary to improve judges' professional competence and accountability in handling commercial cases. Such cases are often complex, requiring judges not only specialised legal knowledge but also expertise in relevant business fields, along with adjudicative skills and practical experience. However, at the district level, judges are required to hear cases across multiple domains, and their experience in adjudicating commercial disputes remains limited, leading to uncertainty in practice. In some instances, a few judges deliberately prolong the resolution of cases due to concerns about professional performance evaluation or reappointment. Therefore, the State should ensure appropriate remuneration policies and strengthen training programs on commercial law and related disciplines for the judiciary. Additionally, the number of judges at district-level courts should be increased to alleviate caseload pressures and ensure the quality and timeliness of adjudication. At the same time, each judge must be held to high standards of professional responsibility and judicial ethics to resolve commercial disputes in strict compliance with the law.

Second, certain provisions of the *2015 Civil Procedure Code* concerning the time limits for resolving commercial cases should be reviewed and amended. Currently, the preparation period for trial in commercial cases is limited to two months from the date of acceptance. Given the complexity of such cases, which often involve extensive fact-finding and the collection of evidence from multiple sources, this period is inadequate. In addition, the service of procedural documents and other investigative steps is time-consuming. The shortage of judges specialised in commercial matters at district-level courts, combined with a heavy caseload, frequently results in case backlogs. Accordingly, it is recommended to amend Point (b), Clause 1, Article 203 of the *2015 Civil Procedure Code* to extend the preparation period for trial in commercial cases to three months.

Furthermore, the provisions on extending the trial preparation period remain vague in complex cases, force majeure events, or objective obstacles. Terms such as "cases of a complex nature," "objective obstacles," and "legitimate reasons" were previously defined under Clause 3, Article 14 of Resolution

No. 05/2012/NQ-HĐTP of the Council of Judges of the Supreme People's Court dated 03 December 2012. However, this resolution has expired without replacement, creating a significant legal gap that judges may exploit to deliberately prolong proceedings.

Third, it is crucial to strengthen mechanisms for monitoring and supervising compliance with statutory time limits in commercial cases, and to impose stricter sanctions for violations. Currently, oversight is mainly conducted through reporting, summaries, and periodic reviews. Nonetheless, commercial cases continue to be delayed without legitimate grounds, in contravention of procedural time limits prescribed by law. Disciplinary measures against judges violating case resolution deadlines remain insufficiently emphasised. In practice, litigants and their legal representatives often submit petitions urging timely adjudication, but the courts' responses and corrective actions are frequently delayed. In some instances, complaints and petitions filed in superior courts remain unresolved for years, exacerbating the problem. To address this situation, effective monitoring of case progress must be prioritised, and judges who breach statutory deadlines should be subject to strict disciplinary measures.

Conclusion

The statutory framework on time limits for pre-trial preparation in commercial cases in Vietnam provides a necessary procedural foundation but suffers from both rigidity and ambiguity. The lack of clarity regarding commencement, expiration and permissible extensions has resulted in inconsistent application, judicial discretion without clear guidance, and prolonged delays that undermine business confidence and legal certainty.

To address these shortcomings, legislative reform is urgently needed. First, the preparation period for commercial cases should be extended to reflect the complexity of such disputes more accurately. Second, explicit criteria must be introduced to define complex cases, objective obstacles, and legitimate grounds for extensions, thereby reducing arbitrary application. Third, judicial accountability should be strengthened through enhanced monitoring and supervision, and stricter disciplinary measures for violations of statutory deadlines.

By adopting these reforms, Vietnam can build a more transparent, efficient, and fair adjudicative framework for commercial cases, ensuring both the timely resolution of disputes and the protection of parties' legitimate rights. Ultimately, such improvements will enhance the credibility of the judiciary and foster a more favourable environment for commercial activities and economic development.

References

Bản Án Số 89/2024/KDTM-ST Ngày 16/9/2024 về Việc "Tranh Chấp Hợp Đồng Dịch vụ" [Judgment No. 89/2024/KDTM-ST Dated September 16, 2024 on "Service Contract Dispute"] (September 16, 2024).

Bản Án Số 168/2024/KDTM-ST Ngày 26/7/2024 về Việc "Tranh Chấp Hợp Đồng Dịch vụ"[Judgment No.

168/2024/KDTM-ST Dated July 26, 2024 on "Service Contract Dispute"] (July 26, 2024).

Civil Procedure Code (2015).

Đoàn Thị Mai. (2023). Tính lại thời hạn chuẩn bị xét xử sơ thẩm vụ án dân sự trong trường hợp thụ lý yêu cầu khởi kiện bổ sung [Recalculate the time limit for preparing for the first instance trial of a civil case in case of accepting a request for additional lawsuit]. *Tạp Chí Tòa Án Nhân Dân Điện Tử [Electronic People's Court Journal]*.

Hà Viết Toàn. (2022). Thời hạn giải quyết vụ án theo thủ tục tố tụng dân sự và thực tiễn áp dụng pháp luật tại Tòa án [Time limit for resolving cases according to civil procedure and practice of law application in Court]. *Tạp Chí Tòa Án Nhân Dân Điện Tử [Electronic People's Court Journal]*. Hiện nay về thời hạn xét xử các vụ việc theo quy định của Bộ luật Tố tụng dân sự năm 2015 còn có nhiều quan điểm khác nhau, trong phạm vi bài viết này tôi xin nêu một số quan điểm của mình về vấn đề này. thông qua thực tiễn xét xử, giải quyết các loại vụ án theo thủ tục tố tụng dân sự.

National Assembly. (2015). *CIVIL CODE*. www.economica.vn

Ngô Văn Hiệp. (2022). Về thời hạn giải quyết vụ án kinh doanh, thương mại [On the time limit for resolving business and commercial cases]. *Tạp Chí Điện Tử Luật Sư Việt Nam [Vietnam Lawyer Journal]*. https://lsvn.vn/ve-thoi-han-giai-quyet-vu-an-kinh-doanh-thuong-mai1661436604-a123032.html?utm_source=chatgpt.com

Port, K. L. (2002). *The Spirit of Japanese Law*. https://openscholarship.wustl.edu/law_globalstudies

Republic France. (n.d.). *Code de procédure civile, Articles 640-646*. Retrieved September 29, 2025, from https://www.legifrance.gouv.fr/codes/id/LEGISCTA000006117241?utm_source=chatgpt.com

Russian Federation. (2002). *Civil Procedure Code of the Russian Federation No. 138-FZ of November 14, 2002 (as amended up to Federal Law No. 428-FZ of December 8, 2020)*.

Tạ Huyền Trang. (2019). Một số kiến nghị hoàn thiện pháp luật về chuẩn bị xét xử sơ thẩm vụ án dân sự [Some recommendations to improve the law on preparing for first instance trial of civil cases]. *Tạp Chí Tòa Án Nhân Dân Điện Tử [Electronic People's Court Journal]*.

Trần Thăng Long, D. N. T. Q. (2022). Cần hoàn thiện quy định về chuẩn bị xét xử sơ thẩm vụ án dân sự [Need to perfect regulations on preparing for first instance trial of civil cases]. *Tạp Chí Điện Tử Kiểm Sát [Electronic Procuracy Journal]*. <https://kiemsat.vn/can-hoan-thien-quy-dinh-ve-chuan-bi-xet-xu-so-tham-vu-an-dan-su-63389.html>

Trương Thị Diễm My. (2020). Gia hạn thời hạn chuẩn bị xét xử sau khi tạm đình chỉ giải quyết vụ án dân sự sơ thẩm [Extension of time limit for preparing for trial after temporary suspension of settlement of first instance civil case]. *Tạp Chí Tòa Án Nhân Dân Điện Tử [Electronic People's Court Journal]*. <https://tapchitoaan.vn/index.php/gia-han-thoi-han-chuan-bi-xet-xu-sau-khi-tam-dinh-chi-giai-quyet-vu-an-dan-su-so-tham>



The Impact of ESG Indices on the Investment Attractiveness of Companies in Sustainable Business Environments

Halyna Mieniyailova ¹, Maryna Kharchenko ², Victoria Krush ³

¹Candidate of Economic Sciences (PhD in Economics), Associate Professor, Associate Professor of the Department of Management Classic Private University, Zaporizhzhia, Ukraine

²Candidate of Economic Sciences (PhD in Economics), Associate Professor of the Department of Management, Classic Private University, Zaporizhzhia, Ukraine, Kremenchuk, Ukraine

³Senior Lecturer, Department of Corporate Finance and Controlling, Faculty of Finance, Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine



Corresponding author:

victoria.krush@kneu.edu.ua



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study aims to identify the impact of ESG indices on the investment attractiveness of companies operating in sustainable business environments. The methodology employs a systematic analysis of empirical studies based on global samples of over 1,500 companies, utilizing panel data models and comparative quintile analysis by ESG ratings. The findings demonstrate that companies with high ESG scores exhibit a 15–20 % reduction in weighted average cost of capital compared to lower-rated counterparts. Three key influence channels were identified: reduction in risk premium, shifts in institutional investor behavior, and regulatory changes in corporate reporting. The results confirm that ESG indices serve as indicators of not only reputational appeal but also financial resilience of companies during crisis periods.

KEYWORDS: ESG indices, investment attractiveness, cost of capital, sustainable development, institutional investors, corporate reporting, financial resilience.

How to cite: Mieniyailova, H., Kharchenko, M., & Krush, V. (2025). The Impact of ESG Indices on the Investment Attractiveness of Companies in Sustainable Business Environments. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 318-324). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.17975125>

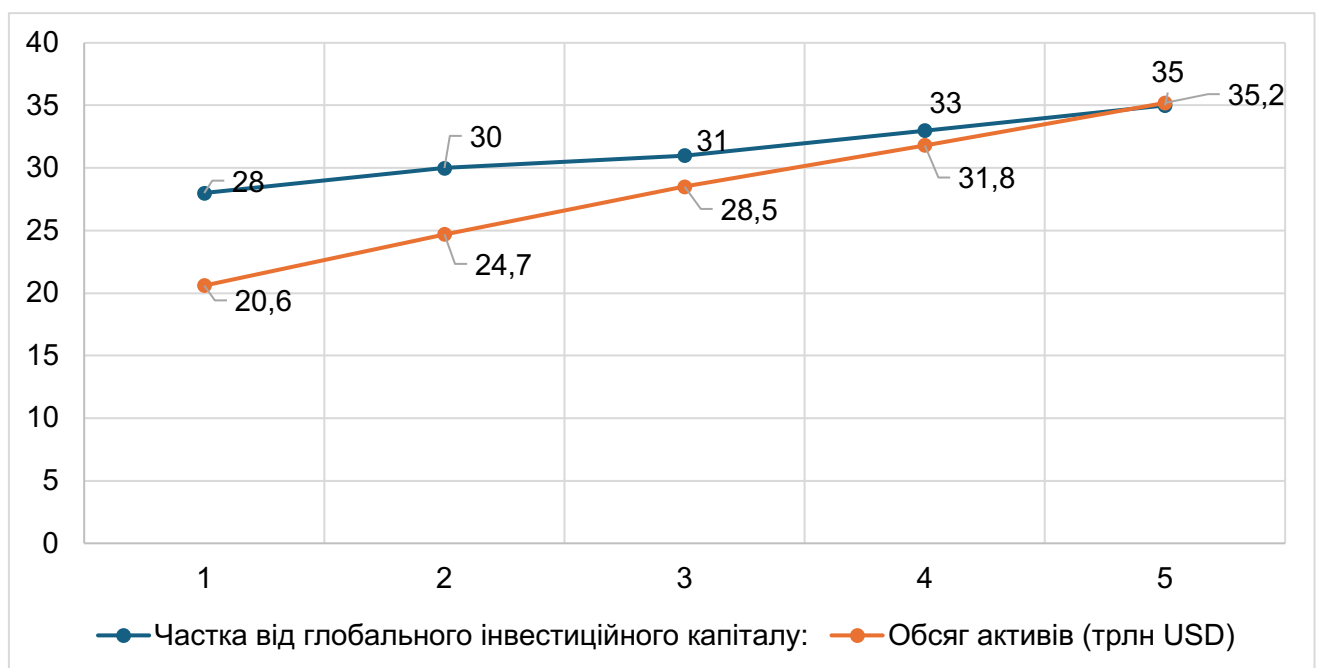
Вступ

Трансформація глобальних інвестиційних ринків упродовж останнього десятиліття характеризується зростанням уваги до нефінансових чинників оцінювання корпоративної діяльності. Традиційні моделі ціноутворення активів ґрунтувалися лише на показниках прибутковості, ліквідності та фінансової стійкості. Натомість інвестиційна парадигма останніх років інтегрує критерії екологічної відповідальності, соціального впливу та якості корпоративного управління. Згідно з оцінками провідних дослідницьких центрів, активи під управлінням із застосуванням ESG-стратегій перевищили 35 трлн. дол. США, що становить понад третину глобального інвестиційного капіталу (рис. 1). У цьому контексті актуальним є питання щодо реального впливу ESG-рейтингів на фінансові параметри підприємств і механізми формування їхньої інвестиційної привабливості.

Попередні дослідження демонструють неоднозначні результати щодо зв'язку між ESG-показниками й вартістю капіталу. Частина емпіричних робіт підтверджує гіпотезу про зниження премії за ризик для компаній із високими ESG-рейтингами. Автори пояснюють це ефектом репутації, поліпшеним доступом до фінансування та зменшенням регуляторних ризиків. Водночас окремі дослідження вказують на відсутність статистично значущого впливу чи навіть негативну кореляцію в короткостроковому періоді. Дослідники пов'язують такі результати з додатковими витратами на впровадження ESG-практик. Методологічні обмеження наявних робіт охоплюють недостатній контроль за галузевими особливостями, обмежені часові горизонти спостережень і відсутність урахування кризових періодів. З огляду на наведене, це знижує можливість узагальнення висновків.

Рисунок 1

Динаміка зростання активів під управлінням із застосуванням ESG-стратегій (2020–2025 рр.)



Джерело: розраховано на основі Global Sustainable Investment Alliance (2021, 2023), Bloomberg Intelligence (2024)

Важливого значення набуває дослідження ролі ESG-критеріїв у контексті макроекономічної нестабільності та геополітичних шоків. Фінансові кризи й воєнні конфлікти радикально змінюють пріоритети інвесторів і підвищують значення факторів стійкості, прозорості управління та здатності компаній адаптуватися до екстремальних умов. Проте наукова література недостатньо висвітлює питання взаємодії між показниками сталого розвитку й вартістю капіталу в умовах системних криз. Зазначене створює пробіл у розумінні механізмів формування інвестиційної привабливості компаній зі сталими практиками.

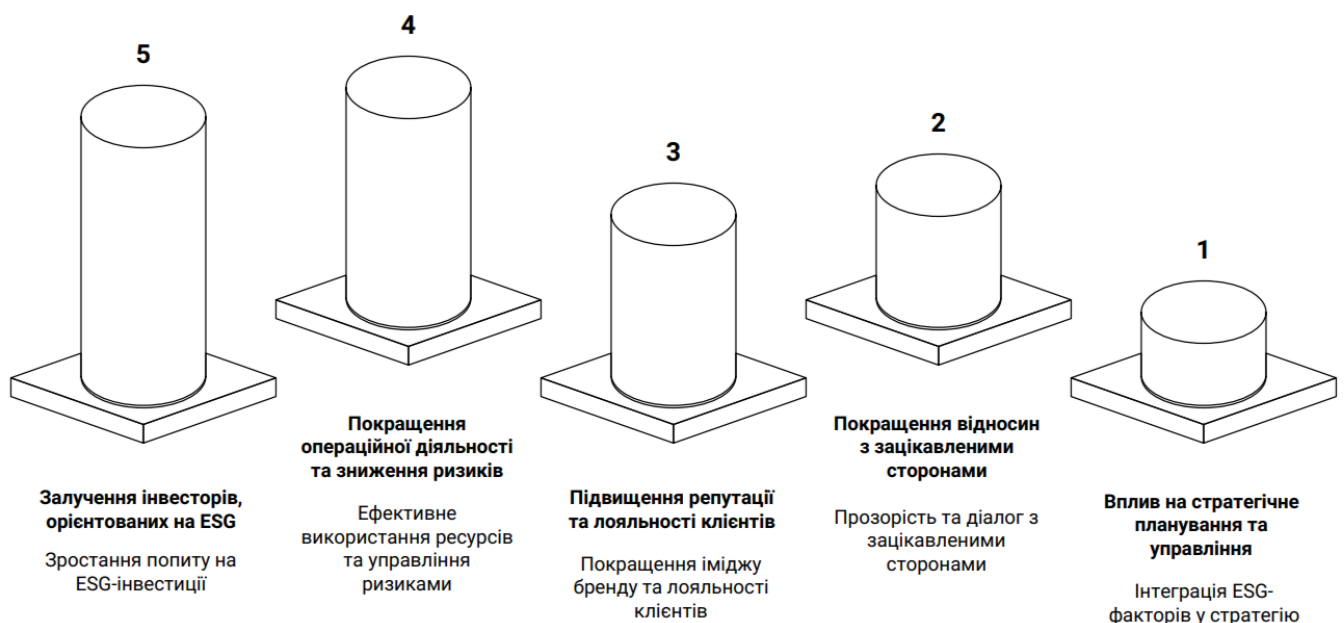
Метою дослідження є комплексний аналіз впливу ESG-індексів на інвестиційну привабливість підприємств крізь призму середньозваженої вартості капіталу (WACC), поведінки інституційних інвесторів і регуляторних змін у сталому інвестиційному середовищі. Дослідження охоплює аналіз даних понад 1500 глобальних компаній, включених до провідних ESG-індексів (MSCI ESG Leaders, S&P 500 ESG) за період 2020-2025 рр., із географічним фокусом на корпораціях Північної Америки, Європи та Азійсько-Тихоокеанського регіону. Окрім того, дослідження спрямоване на виявлення емпіричних закономірностей, що пов'язують ESG-рейтинги з фінансовими параметрами компаній, а також на з'ясування каналів, через які показники сталого розвитку впливають на доступ підприємств до капіталу та їхню ринкову оцінку в умовах підвищеної невизначеності.

Результати досліджень

Систематизований аналіз емпіричних досліджень підтверджує, що інтеграція ESG-показників у моделі оцінки ризику супроводжується стійким зниженням вартості капіталу та зростанням ринкової оцінки підприємств, включених до провідних ESG-індексів (рис. 2). Це узгоджується з результатами, поданими в дослідженнях (MSCI, 2025; Malich & Husi, 2025).

Рисунок 2

Канали впливу ESG-індексів на інвестиційну привабливість підприємств



Джерело: авторська розробка.

Порівняння квінтилів компаній за рівнем ESG-рейтингу демонструє, що емітенти з найвищими показниками мають нижчу середньозважену вартість капіталу на 15-20 % у порівнянні з підприємствами з найнижчими оцінками (табл. 1), що відображає скорочення премії за ризик і поліпшення умов боргового й акціонерного фінансування (Malich & Husi, 2025; Rohara, 2025).

Таблиця 1

Порівняльний аналіз середньозваженої вартості капіталу (WACC) за ESG-квінтілями

ESG-квінтіль	Середній ESG-рейтинг	WACC (%)	Відхилення від 1-го квінтіля	Премія за ризик (%)
1-й (найвищий)	85-100	6.2	-	2,8
2-й	70-84	6.8	+0,6 п.п.	3,2
3-й	55-69	7.3	+1,1 п.п.	3,7
4-й	40-54	7.8	+1,6 п.п.	4,3
5-й (найнижчий)	0-39	8.5	+2,3 п.п.	5,1

Примітка: п.п. – процентні пункти. Різниця між 1-м та 5-м квінтілем становить 2.3 п.п., що еквівалентно зниженню WACC на 27 % для компаній із найвищими ESG-рейтингами.

Джерело: розраховано на основі даних Malich & Husi (2025), Rohara (2025); вибірка 1500+ глобальних компаній

Панельні моделі, що побудовані для вибірок понад 1500 глобальних компаній, підтверджують статистично значущу негативну залежність між інтегральними ESG-рейтингами та WACC навіть після контролю за розміром, галуззю та показниками прибутковості (Eccles et al., 2023).

Окрім того, вплив ESG-індексів на інвестиційну привабливість підсилюється операційною якістю бізнес-процесів, зокрема управління запасами та виробничими ресурсами. Практика впровадження систем планування потреб у матеріалах у компаніях FMCG показує, що послідовне скорочення нестачі та надлишків запасів, підвищення прогнозованості грошових потоків і зменшення операційних ризиків створює базу для кращого сприйняття таких підприємств інвесторами та кредиторами, посилюючи ефект від високих ESG-показників (Hasenko, 2025). Таким чином, сучасні підходи до управління ресурсами, поєднані з індексною присутністю в ESG-бенчмарках, формують комплексний профіль надійності, що безпосередньо відображається в показниках вартості капіталу та ринкових мультиплікаторів.

Зміна поведінки інституційних інвесторів є ще одним важливим каналом впливу ESG-індексів на інвестиційну привабливість підприємств. Глобальні опитування показують, що більшість професійних інвесторів інтегрує критерії сталого розвитку в інвестиційні мандати, причому зростає частка стратегій, які поєднують інтегрований підхід до ESG і тематичні інвестиції в енергетичний перехід, декарбонізацію та соціальну стійкість (BNP Paribas Securities Services, 2025; Cambridge Associates, 2025). Унаслідок цього включення компаній до ESG-індексів запускає механічний додатковий попит із боку пасивних фондів і бенчмарк-орієнтованих

портфелів, що виявляється у вищих обсягах торгів, нижчих спредах і стійкішому інтересі інвесторів навіть у періоди підвищеної ринкової волатильності (SoFi Learn, 2025; MSCI, 2025).

Регуляторні зміни в ЄС та на глобальному рівні посилюють роль ESG-індексів як інструменту селекції підприємств для доступу до капіталу. Запровадження вимог до корпоративної звітності про сталий розвиток, стандартів розкриття інформації, зорієнтованих на інвесторів, а також гармонізація нефінансових показників підвищують порівнюваність і надійність ESG-даних, що прямо враховується в методологіях рейтингових агентств та індексних провайдерів (European Commission, 2023; International Sustainability Standards Board, 2023). У воєнних і кризових умовах значення прозорості, якості управління та здатності компаній витримувати екстремальні шоки додатково зростає, оскільки макрофінансові рішення урядів і центральних банків щодо підтримки ліквідності та боргової стійкості роблять такі характеристики ключовими орієнтирами для інвесторів (Kalinina et al., 2023).

З огляду на наведене, розвиток практик стрес-тестування банківської системи в умовах війни демонструє, що інвестиційні рішення дедалі частіше спираються на сценарну оцінку стійкості фінансових посередників і корпоративних позичальників до шоків, що пов'язані з кредитним, процентним і макроекономічним ризиками (Bakalo, 2025). Результати таких моделей показують, що найбільш стійкими є профілі, у яких поєднуються диверсифікована структура активів, прозоре розкриття інформації, ефективне управління ризиками та відповідність сучасним ESG-стандартам, що узгоджується зі спостереженнями щодо нижчої вартості капіталу та вищої ринкової оцінки для підприємств із високими ESG-рейтингами (Zhou et al., 2025; MSCI, 2025). У комплексі це підтверджує, що включення до ESG-індексів постає не лише маркером репутаційної привабливості, а й індикатором фінансової стійкості та здатності компаній залучати капітал на вигідніших умовах у сталому інвестиційному середовищі.

Висновки

Проведене дослідження підтверджує визначальну роль ESG-індексів у формуванні інвестиційної привабливості підприємств. Емпіричний аналіз демонструє, що компанії з високими ESG-рейтингами мають на 15–20 % нижчу середньозважену вартість капіталу в порівнянні з підприємствами низького рейтингового сегмента, що свідчить про системне скорочення премії за ризик і поліпшення умов фінансування. Для забезпечення статистично значущого ефекту на WACC підприємствам рекомендовано досягти мінімального рівня ESG-рейтингу не нижче 70 балів (2-й квінтіль), що забезпечує зниження вартості капіталу щонайменше на 0.6 процентного пункту в порівнянні з компаніями найвищого квінтілю.

Встановлено, що ефект від ESG-інтеграції підсилюється операційною досконалістю бізнес-процесів, зокрема ефективним управлінням запасами та ресурсами. Синергія високих ESG-показників та якісного менеджменту формує комплексний профіль надійності, що безпосередньо відображається в ринкових оцінках підприємств. Пріоритетними компонентами ESG-профілю для виробничих підприємств є управлінські практики (G-компонент) та екологічні показники (E-компонент), тоді як для компаній сфери послуг критичного значення набуває соціальна відповідальність (S-компонент) та корпоративне управління.

Трансформація поведінки інституційних інвесторів виступає важливим каналом впливу ESG-індексів. Масова інтеграція критеріїв сталого розвитку в інвестиційні стратегії генерує додатковий попит із боку пасивних фондів, що проявляється в підвищених обсягах торгівлі та стабільнішому інвесторському інтересі навіть у періоди ринкової волатильності. Компаніям рекомендовано активно працювати над включенням до провідних ESG-індексів (MSCI ESG Leaders, S&P 500 ESG, FTSE4Good) для отримання автоматичного доступу до капіталу інституційних інвесторів.

Регуляторні ініціативи щодо стандартизації корпоративної звітності значно підсилюють значення ESG-індексів як селективного інструменту доступу до капіталу. В умовах геополітичної нестабільності прозорість управління та стійкість до екстремальних ризиків набувають додаткової ваги, що робить включення до ESG-індексів не лише репутаційним маркером, а й індикатором фінансової стабільності.

Перспективи подальших досліджень полягають у поглибленому аналізі галузевої специфіки впливу ESG-факторів на вартість капіталу з урахуванням регіональних особливостей, зокрема порівняння ефективності ESG-стратегій у розвинених ринках Північної Америки та Європи порівняно з ринками, що розвиваються, Азійсько-Тихоокеанського регіону. Актуальним є вивчення динаміки взаємозв'язку між операційною ефективністю та рейтинговими оцінками в контексті цифрової трансформації, а також розроблення інтегрованих моделей оцінки, які поєднують фінансові індикатори з показниками екологічної та соціальної стійкості.

Література

- Bakalo, I. (2025). Stress testing of the banking system of Ukraine: Tools, scenarios and results in wartime conditions. *Scientific Notes of Ostroh Academy National University, "Economics" Series*, 1(37), 37-42. [https://doi.org/10.25264/2311-5149-2025-37\(65\)-37-42](https://doi.org/10.25264/2311-5149-2025-37(65)-37-42)
- Bloomberg Intelligence. (2024). *Global ESG assets predicted to hit \$40 trillion by 2030, despite challenging environment*. <https://www.bloomberg.com/company/press/global-esg-assets-predicted-to-hit-40-trillion-by-2030-despite-challenging-environment-forecasts-bloomberg-intelligence/>
- BNP Paribas Securities Services. (2025). *ESG global survey 2025: Institutional investors remain committed to sustainable investing despite growing complexities*. <https://securities.cib.bnpparibas/bnp-paribas-esg-survey-2025-press-release/>
- Cambridge Associates. (2025). *Sustainable and impact investing 2024: Insights and perspectives*. <https://www.cambridgeassociates.com/insight/sustainable-and-impact-investing-2024-insights-and-perspectives/>
- Eccles, J. K., Iñiguez de Onzoño, S., Maquieira, C. P., & Tayag, J. (2023). How do ESG ratings impact firms' profitability and cost of capital? Evidence from ASEAN+3. *Journal of Management for Global Sustainability*, 11(1), 77-107. <https://archium.ateneo.edu/cgi/viewcontent.cgi?article=1219&context=jmgs>

- European Commission. (2023). *Corporate sustainability reporting directive (CSRD)*. https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en
- Global Sustainable Investment Alliance. (2021). *Global sustainable investment review 2020*. <http://www.gsi-alliance.org/wp-content/uploads/2021/08/GSIR-20201.pdf>
- Global Sustainable Investment Alliance. (2023). *Global sustainable investment review 2022*. <http://www.gsi-alliance.org/>
- Hasenko, Y. (2025). Implementation of MRP systems as a tool for improving inventory management efficiency in FMCG companies. *Aktual'ni pytannia ekonomichnykh nauk*, 16. <https://doi.org/10.5281/zenodo.17551471>
- International Sustainability Standards Board. (2023). *IFRS sustainability disclosure standards*. <https://www.ifrs.org/issued-standards/ifrs-sustainability-standards-navigator/>
- Kalinina, I., Marena, T., & Oliinyk, V. (2023). Theoretical foundations and practice of the actions of governments and central banks in the conditions of war: Historical excursion and Ukrainian realities. *Technology Audit and Production Reserves*, 6(4), 24–31. <https://doi.org/10.15587/2706-5448.2023.278349>
- Malich, J., & Husi, A. (2025). *MSCI ESG ratings and cost of capital*. MSCI. <https://www.msci.com/documents/10199/6c2115f3-5fef-b883-278d-853de6ffc019>
- MSCI. (2025). *ESG and the cost of capital*. MSCI Research & Insights. <https://www.msci.com/research-and-insights/esg-and-the-cost-of-capital>
- Rohara, S. (2025). *The relationship between ESG performance and cost of capital* (SSRN Working Paper No. 5261740). <https://doi.org/10.2139/ssrn.5261740>
- SoFi. (2025). *What are ESG funds and how do they work?* <https://www.sofi.com/learn/content/what-are-esg-funds/>
- Zhou, S., Wang, P., & Li, Y. (2025). Does environmental, social, and governance news affect firms' risk and value? *Frontiers in Public Health*, 13, Article 1509167. <https://doi.org/10.3389/fpubh.2025.1509167>



State Promotion of Innovation Activity as a Factor of Ukraine's Investment Attractiveness

Maksym Zhylytsov ¹

¹ Postgraduate student, National Transport University, Kyiv, Ukraine



Corresponding author:

maxwell3525@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: The study analyzes the impact of state instruments for stimulating innovation activity on Ukraine's investment attractiveness in the context of European integration. The methodology encompasses comparative analysis of regulatory mechanisms, statistical analysis of investment index dynamics for 2021–2025, and systematization of tax and financial support instruments. A comprehensive state support system, including the “Diia.City” regime, industrial parks, eRobota program, and significant investments mechanism, provides differentiated incentives for the IT sector, startups, and industrial projects. Despite the investment attractiveness index recovery to 2.70 points in 2025, Ukraine remains at 29 % of the EU average, highlighting the need to strengthen incentive mechanisms within the WINWIN 2030 Strategy framework.

KEYWORDS: state incentives, innovative activity, investment attractiveness, tax breaks, “Diia.City,” industrial parks, “WINWIN 2030” strategy, European integration.

How to cite: Zhylytsov, M. (2025). State Promotion of Innovation Activity as a Factor of Ukraine's Investment Attractiveness. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 325-332). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.18044637>

Вступ

Трансформація глобальної економіки в напрямі інноваційно-технологічного розвитку створює нові виклики для країн із транзитивною економікою, що узгоджується з глобальними тенденціями цивілізаційного прогресу та досягнення Цілей сталого розвитку (European Commission, 2025), які прагнуть інтегруватися у високотехнологічні ланцюги створення вартості. Україна, перебуваючи на траєкторії євроінтеграції та економічної модернізації, стикається з необхідністю формування конкурентоспроможної інноваційної екосистеми, що здатна залучати як вітчизняний, так і іноземний капітал у високотехнологічні галузі (Гетманенко, 2025). З огляду на це, державне стимулювання інноваційної активності постає критично важливим чинником формування інвестиційної привабливості, особливо в умовах обмежених фінансових ресурсів і геополітичної нестабільності (Bakalo, 2025).

За останні п'ять років український уряд розробив комплексну систему підтримки інноваційної діяльності, що поєднує податкові пільги, пряме фінансування та спеціальні правові режими для різних секторів економіки. Запровадження режиму «Дія.City» для IT-компаній, розвиток мережі індустриальних парків, реалізація програми eRobota через Український фонд стартапів і впровадження механізму підтримки значних інвестицій формують багаторівневу архітектуру стимулювання, зорієнтовану на різні категорії інноваційних підприємств. Водночас ефективність цих інструментів у контексті підвищення загальної інвестиційної привабливості країни залишається недостатньо дослідженою.

Попередні дослідження демонструють неоднозначні результати щодо впливу державних стимулів на реальні показники інноваційної активності та інвестиційні потоки. Частина емпіричних робіт підтверджує позитивний вплив податкових пільг на зростання витрат на R&D і залучення венчурного капіталу, пояснюючи це зниженням вартості інновацій і покращенням очікуваної прибутковості проєктів. Водночас окремі дослідження вказують на обмежену ефективність фіскальних стимулів в умовах інституційної слабкості, високих трансакційних витрат і недостатнього розвитку фінансової інфраструктури. Методологічні обмеження наявних досліджень охоплюють недостатній аналіз взаємодії між різними інструментами стимулювання, обмежені часові горизонти спостережень та відсутність порівняльного аналізу з країнами регіону, що знижує можливість узагальнення отриманих висновків.

У цьому контексті особливого значення набуває дослідження ефективності державного стимулювання в умовах воєнного стану та макроекономічної нестабільності. Геополітичні шоки радикально змінюють інвестиційні пріоритети, підвищуючи значення факторів безпеки, стабільності правових режимів і здатності держави підтримувати інноваційний потенціал навіть у екстремальних умовах. Проте наявна наукова література недостатньо висвітлює питання адаптації механізмів стимулювання до кризових умов та їхнього впливу на інвестиційну привабливість у довгостроковій перспективі, що створює прогалину в розумінні оптимальної архітектури державної підтримки інновацій.

Мета дослідження

Метою дослідження є комплексний аналіз впливу державних інструментів стимулювання

інноваційної активності на інвестиційну привабливість України, що передбачає систематизацію регуляторних механізмів, оцінювання динаміки інвестиційних індексів і порівняльний аналіз позиціонування країни в регіональному інноваційному ландшафті. Дослідження охоплює аналіз ключових програм державної підтримки (режим «Дія.City», індустриальні парки, програма eRobota, механізм значних інвестицій) за період 2021–2025 рр., з географічним фокусом на порівнянні України з країнами Центральної та Східної Європи.

Методологія дослідження

Методологічне підґрунтя дослідження базується на комплексному використанні методів економічного аналізу, статистичної обробки даних і порівняльних досліджень. Для систематизації інструментів застосовано метод структурно-функціонального аналізу, що класифікує механізми підтримки за типом, цільовою аудиторією та очікуваними ефектами. Оцінювання динаміки інвестиційної привабливості здійснено відповідно до даних Європейської Бізнес Асоціації та Європейського табло інновацій за 2025 рік. Порівняльний аналіз програм державної підтримки систематизовано у формі таблиці за критеріями типу підтримки, розміру, цільової аудиторії та умов отримання. Обмеження дослідження зумовлені відсутністю повних статистичних даних через воєнний стан, а також обмеження щодо публічного розкриття інформації.

Результати досліджень

Систематизований аналіз державних інструментів стимулювання інноваційної активності підтверджує формування в Україні багаторівневої системи підтримки, що охоплює різні сегменти інноваційної екосистеми та забезпечує диференційовані стимули залежно від специфіки бізнес-моделей і масштабу проєктів (рис. 1).

Варто зауважити, що практична реалізація державної підтримки здійснюється через диверсифікований набір інструментів, кожен з яких орієнтований на специфічні потреби різних категорій інноваційних підприємств (Ministry of Education and Science of Ukraine, 2025). Режим «Дія.City» для IT та телекомунікаційних компаній пропонує пільгове оподаткування виведеного капіталу за ставкою 9 %, гнучкі форми співпраці зі спеціалістами та венчурні правові інструменти, що забезпечує конкурентні умови в порівнянні з іншими юрисдикціями Східної Європи. Індустриальні парки надають керуючим компаніям та учасникам податкові й митні пільги строком на 10 років, компенсацію відсоткових ставок за кредитами, а також можливість безповоротного фінансування інфраструктурних проєктів (UkraineInvest, 2023, 2025). Водночас програма eRobota через Український фонд стартапів забезпечує безповоротні гранти в розмірі від 750 тис. до 3,5 млн гривень для покриття витрат на дослідження та розробки, зорієнтовані на ранні стадії інноваційного циклу (Ukrainian Startup Fund, 2025).

Рисунок 1

Структура державних інструментів стимулювання інноваційної активності в Україні



Джерело: власна розробка автора.

Для наочної демонстрації різноманітності зазначених механізмів підтримки та їхніх ключових параметрів доцільно навести порівняльну характеристику головних програм (табл. 1).

Таблиця 1

Порівняльний аналіз головних програм державної підтримки інноваційної діяльності в Україні

Програма підтримки	Тип підтримки	Розмір підтримки	Цільова аудиторія	Термін дії
Дія.City	Податкові пільги	Податок на виведений капітал – 9 %	IT- та R&D-компанії	Постійний режим
Значні інвестиції	Державна підтримка	До 30 % вартості проєкту	Проєкти понад 20 млн євро	5 років
Індустріальні парки	Податкові канікули	10 років звільнення від податку на прибуток	Учасники індустріальних парків	10 років
eRobota гранти	Безповоротне фінансування	Від 750 тис. до 3,5 млн грн	Стартапи та технологічні компанії	Конкурсний відбір
Електромобілі	Податкові пільги	Звільнення від податку на прибуток	Виробники електротранспорту	До 31 грудня 2035

Джерело: систематизовано автором на основі законодавства України та офіційних джерел, зокрема Міністерства цифрової трансформації України та Міністерства економіки України.

Примітка: дані наведено станом на грудень 2025 року. Фактичний обсяг підтримки може варіюватися залежно від виконання умов відповідних програм.

Поряд із цими горизонтальними механізмами підтримки, які доступні широкому колу інноваційних підприємств, держава розробила вертикальні інструменти, зорієнтовані на стратегічно важливі галузі економіки. Секторальні податкові стимули формують цільові стимули для розвитку критичних технологічних напрямів (Verkhovna Rada of Ukraine, 2024). Зокрема авіаційні компанії отримують тимчасове звільнення від податку на прибуток підприємств до

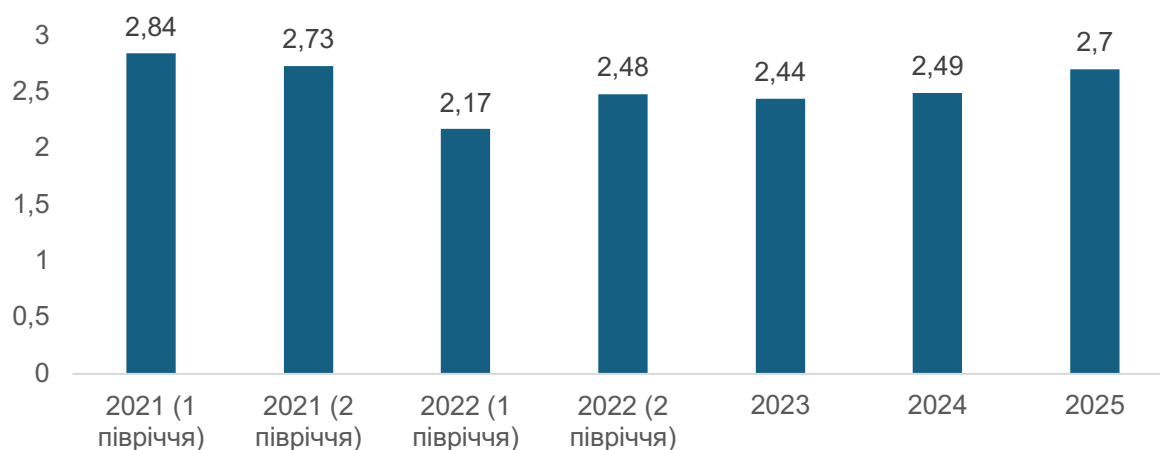
2025 р. за умови реінвестування вивільнених коштів у дослідження та технологічні оновлення. Окрім того, виробники електромобілів, батарей та електродвигунів мають право на звільнення від податку на прибуток до 31 грудня 2035 р., якщо заощадження спрямовуються на дослідження в галузі електротранспорту (Verkhovna Rada of Ukraine, 2024).

Цей секторальний підхід було інституційно закріплено на початку 2025 р., коли уряд затвердив Стратегію інноваційного цифрового розвитку «WINWIN 2030», що передбачає розширення інструментарію підтримки через інноваційні гранти, ваучери, інструменти державних закупівель та підтримку стартап-шкіл, наукових парків та ініціативи Science.City (Lviv Polytechnic National University, 2025). Системне фінансування інноваційної діяльності та комерціалізації досліджень спрямоване на формування єдиної екосистеми, у межах якої різні інструменти доповнюють один одного та забезпечують підтримку на всіх стадіях інноваційного циклу (Pidorycheva, 2021).

Оцінюючи ефективність цих різноманітних інструментів стимулювання крізь призму загальної інвестиційної привабливості України, варто розглянути динаміку відповідних індексів у регіональному контексті. Інвестиційна привабливість України в інноваційній сфері демонструє поступове покращення після кризового падіння 2022 р., хоча й надалі поступається більшості країн Східної Європи (European Business Association, 2025; Duravkin, 2022). Згідно з даними Європейської Бізнес Асоціації, індекс інвестиційної привабливості України зріс до рівня 2,70 з 5 балів у 2025 р. у порівнянні з мінімальним значенням 2,28 бала у 2022 р., що свідчить про певну позитивну динаміку навіть в умовах воєнного стану (European Business Association, 2025) (рис. 2).

Рисунок 2

Динаміка індексу інвестиційної привабливості України за 2021–2025 роки



Джерело: розраховано автором на основі даних Європейської Бізнес Асоціації.

Примітка: індекс розраховується за 5-бальною шкалою, де 1 – дуже негативно, 5 – дуже позитивно.

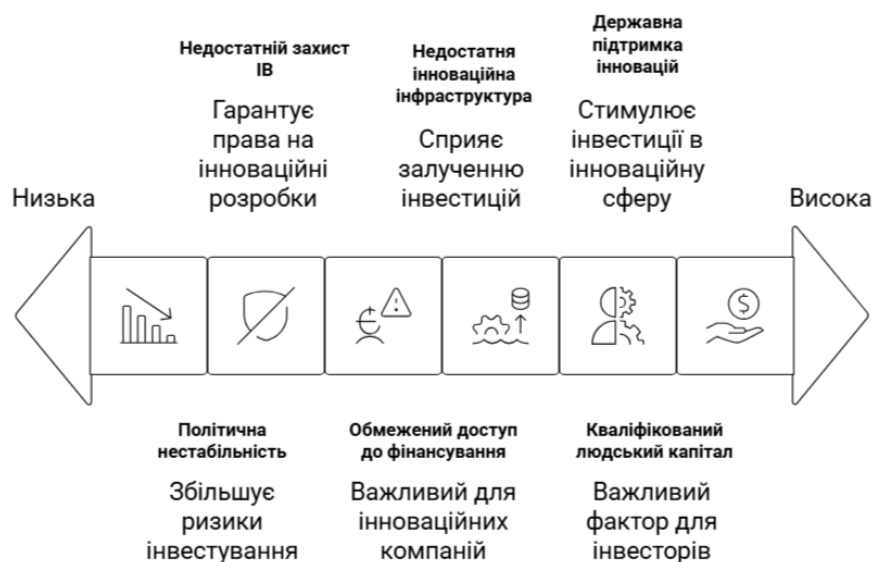
Згідно з Європейським табло інновацій за 2025 р., Україна класифікується як «країна, що розвивається в інноваціях» із показником 29 % від середнього рівня ЄС та займає 37-ме місце серед країн ЄС і сусідніх держав. Цей показник є значно нижчим за показники

центральноєвропейських країн – членів ЄС, зокрема Польщі (78 % від середнього рівня ЄС), Чехії (92 %), Естонії (104 %) чи Литви (88 %), які належать до груп «помірних» або «сильних» інноваторів (European Commission, 2025). Водночас Україна демонструє кращі показники в порівнянні з Молдовою (24 %), Північною Македонією (27 %) та деякими іншими країнами-кандидатами на вступ до ЄС.

Таким чином, наведені кількісні показники відображають неоднозначне, але водночас перспективне позиціонування України на регіональному інноваційному ландшафті. У порівнянні з іншими східноєвропейськими країнами Україна пропонує динамічне, проте більш ризикове стартап-середовище. Україна є менш конкурентоспроможною за загальною інноваційною спроможністю та якістю інституцій, однак постає відносно привабливою для окремих нішевих секторів, зокрема оборонних технологій, кібербезпеки, енергетики та ІТ-послуг (рис. 3).

Рисунок 3

Чинники, що впливають на інвестиційну привабливість України в інноваційній сфері



Джерело: розроблено автором відповідно до аналізу Європейського табло інновацій за 2025 р. та експертних оцінок.

Воєнний попит на інноваційні рішення, наявність висококваліфікованого людського капіталу (Iliina, 2025) та процифрові реформи формують потенціал зростання, який для деяких інвесторів компенсує слабше верховенство права та підвищені безпекові ризики. Таким чином, дерегуляція та цифровізація державних послуг, а також курс на євроінтеграцію особливо підтримують ІТ-сектор і стартап-екосистему, що підтверджується зростанням кількості резидентів «Дія.City» до понад 1000 компаній станом на кінець 2025 року.

Усвідомлюючи необхідність компенсувати структурні обмеження через більш агресивні стимули для масштабних проєктів, держава запровадила спеціальні механізми підтримки великих інвестицій. Закон України «Про державну підтримку інвестиційних проєктів із значними інвестиціями» від 17 грудня 2020 р. № 1116-IX формує потужний механізм залучення великих інвесторів до реалізації інноваційних проєктів (UkraineInvest, 2023, 2025). Проєкти вартістю понад 20 млн євро, які передбачають створення понад 80 робочих місць, можуть отримати

звільнення від податку на прибуток підприємств строком до п'яти років, звільнення від ввізного мита та ПДВ на нове обладнання, а також зниження земельного податку. Загалом обсяг підтримки становить близько 30 % вартості проекту, що відповідає стандартам державної допомоги ЄС і робить цей механізм привабливим для масштабних інноваційних ініціатив (UkraineInvest, 2023, 2025).

Розширюючи цей інструментарій підтримки великих проектів, нова програма для інвесторів у переробні галузі дає змогу отримати 30–70 % компенсації прийнятних капітальних інвестицій через податкові пільги, до 10 років звільнення від податку на прибуток і пільги з ПДВ і ввізного мита на обладнання (UkraineInvest, 2023, 2025; Верховна Рада України, 2024). Зазначені механізми мають важливе значення для залучення іноземних інвестицій у високотехнологічні виробництва та дослідницькі центри в умовах, коли традиційні чинники конкурентоспроможності (стабільність, верховенство права, розвинена інфраструктура) ще не досягли рівня розвинених країн регіону.

Поєднання прямої фінансової підтримки у формі грантів і непрямой підтримки через податкові пільги створює комплексну систему стимулювання, що може конкурувати з аналогічними програмами в інших країнах регіону (Duravkin, 2022). Водночас ефективність цієї системи залежить не лише від щедрості стимулів, а й від якості адміністрування, прозорості процедур, передбачуваності правил і загального бізнес-клімату. Отже, хоча індустриальні парки та зони пріоритетного розвитку пропонують 10-річні податкові канікули та компенсацію інфраструктурних витрат, їхній потенціал наразі стримується дефіцитом фінансування інфраструктури та повільністю адміністративних процедур (UkraineInvest, 2023, 2025).

Висновки

Здійснений аналіз підтверджує формування в Україні комплексної багаторівневої системи стимулювання інноваційної активності, що охоплює різні сегменти від стартапів до масштабних індустриальних проектів через податкові пільги (режим «Дія.City», індустриальні парки), пряме фінансування (програма eRobota) та секторальні стимули для стратегічно важливих галузей економіки. Попри відновлення індексу інвестиційної привабливості до рівня 2,70 бала у 2025 р. у порівнянні з кризовим мінімумом 2,28 бала у 2022 р., Україна досі суттєво поступається країнам Центральної та Східної Європи. Статус «країни, що розвивається в інноваціях» із показником 29 % від середнього рівня ЄС (37-ме місце) контрастує з показниками Польщі (78 %), Чехії (92 %) і країн Балтії. Ефективність наявних стимулів обмежується не лише щедрістю підтримки, а й якістю інституційного середовища. Воєнний стан, недостатній рівень верховенства права та інфраструктурні обмеження знижують реальний вплив запроваджених механізмів. Водночас висококваліфікований людський капітал, процифрові реформи та євроінтеграція створюють конкурентні переваги в нішевих секторах, зокрема в ІТ, кібербезпеці та оборонних технологіях.

Отже, для посилення впливу державного стимулювання доцільно спростити адміністративні процедури, забезпечити прозорість і передбачуваність правил, посилити інфраструктурне фінансування, а також гармонізувати національні механізми підтримки зі

стандартами ЄС. Реалізація цих рекомендацій у контексті Стратегії «WINWIN 2030» може суттєво посилити позиції України як інноваційного хабу Східної Європи.

Література

- Bakalo, I. (2025). Stress testing of the banking system of Ukraine: Tools, scenarios and results in wartime conditions. *Scientific Notes of Ostroh Academy National University, "Economics" Series*, 1(37(65)), 37–42. [https://doi.org/10.25264/2311-5149-2025-37\(65\)-37-42](https://doi.org/10.25264/2311-5149-2025-37(65)-37-42)
- Duravkin, P. (2022). Tax incentives for innovative activities. *Law and Innovative Society*, 2(19), 46–58. <https://apir.org.ua/lais/uk/article/download/386/346/427>
- European Commission. (2025). *European Innovation Scoreboard 2025: Country profile Ukraine (Independent expert report)*. Directorate General for Research and Innovation; Directorate General for Internal Market, Industry, Entrepreneurship and SMEs. https://ec.europa.eu/assets/rtd/eis/2025/ec_rtd_eis-country-profile-ua.pdf
- Гетманенко, О. О. (2025). Трансформація зовнішньоекономічної діяльності України в умовах війни: аналіз, виклики та сценарії до 2030 року. *Міжнародний науковий журнал "Інтернаука". Серія: "Економічні науки"*, (4). <https://doi.org/10.25313/2520-2294-2025-4-10923>
- Illina, A. (2025). Modeling of a system for effective ranking governance of human capital development in Ukraine. *Věda a perspektivy*, (8(51)), 8–28. [https://doi.org/10.52058/2695-1592-2025-8\(51\)-8-28](https://doi.org/10.52058/2695-1592-2025-8(51)-8-28)
- Pidorycheva, I. (2021). Innovation ecosystems of Ukraine: A conceptual framework and development priorities. *Economic and Industrial Policy*, 4, 7–28. <http://ojs.econindustry.org/index.php/ep/article/view/221>
- UkraineInvest. (2023). IT industry incentives: Diia City special legal and tax regime; Industrial parks incentives. <https://ukraineinvest.gov.ua/en/incentives/it/>
- Ukrainian Startup Fund. (2025). eRobota grant program. <https://usf.com.ua/erobota/>
- Верховна Рада України. (2024, 4 грудня). Про внесення змін до Податкового кодексу України та інших законів України щодо стимулювання розвитку цифрової економіки в Україні № 4113-IX. <https://zakon.rada.gov.ua/laws/show/4113-20/card2#Card>
- Міністерство освіти і науки України. (2025, 27 серпня). Уряд оновлює законодавство для розвитку інноваційної діяльності в Україні. <https://nauka.gov.ua/news/uriad-onovliuie-zakonodavstvo-dlia-rozvytku-innovatsiinoi-diialnosti-v-ukraini>



Fortune 500 Corporate Culture Transformation Model for Application in Small Businesses

Hennadii Pysanko ¹ 

¹ Master's Degree, Director of People and Talent, WhiteTech, Tallinn, Estonia

✉ **Corresponding author:**
hpysanka@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study aims to adapt corporate culture transformation (CCT) models developed for Fortune 500 companies to small business operations, considering their specific characteristics. Using analysis, synthesis, abstraction, induction, and deduction methods, the following CCT models were examined: leader values-based models, integrated communication model, employee engagement models, training and development models, and flexible organizational process models. The study identified the impact of internal (leadership, organizational structure) and external (competitive environment, technological changes) factors on CCT model adaptation. Recommendations were formulated for implementing adapted CCT models, emphasizing micro-leadership development, employee involvement in decision-making processes, and fostering innovative culture to enhance organizational adaptability.

KEYWORDS: corporate culture transformation, model adaptation, small business, leadership, organizational structure, employee engagement, innovative culture, organizational development, internal organizational communication, organizational flexibility.

How to cite: Pysanko, H. (2025). Fortune 500 Corporate Culture Transformation Model for Application in Small Businesses. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 333-337). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.18060248>

Introduction

In today's dynamic business environment, the transformation of corporate culture (TCC) is one of the determining factors of organizational success regardless of scale. Models developed within large companies, including Fortune 500 firms, may appear poorly suited to small businesses; however, with appropriate adaptation, their potential is substantial. Corporate culture is understood not as a formal set of rules, but as an integrated system of interaction among employees that shapes shared values, defines behavioral orientations, and creates a foundation for innovative development. Rudachenko et al. (2025) demonstrate that corporate culture shapes values, management style, and the motivational climate. The authors propose a systemic transformation model that includes analytical and diagnostic, conceptual and goal oriented, strategic planning, implementation, and monitoring and corrective stages. This model emphasizes adaptability and strategic relevance under conditions of digitalization and globalization challenges. Chobitok and Kostrova (2025) note that corporate culture is a strategic resource for enterprise development. The researchers emphasize the need to modify existing models for small and medium sized enterprises, with particular attention to the integration of values into daily activities and effective internal communication in the Ukrainian context. Shymanovska Dianych and Lakhyzha (2025) show that the development of the IT business in Ukraine is driven by intellectual potential, workforce qualifications, and an effective corporate culture. Corporate culture contributes to the psychological resilience of teams under challenging conditions and ensures a balance between productivity and employees' mental health.

Under current conditions, the study of TCC processes in small businesses becomes particularly relevant. Rapid changes in the market environment create a need for prompt responses and high adaptability, which are critically important for small enterprises. In this regard, attention is focused on examining how principles that have proven effective in large organizations can be adapted to the specific characteristics of small businesses. The results of the study make it possible to deepen the understanding of TCC processes and to outline ways of their practical application in the managerial activities of small enterprises. This approach provides the study with both scientific and practical significance, creating a foundation for further research and the implementation of effective methods for managing corporate culture in small businesses.

Research Purpose and Research Questions

The purpose of the study is to analyze the adaptation and modification of TCC models applied in Fortune 500 companies for their effective implementation in small businesses, taking into account the specific characteristics and constraints of small enterprises.

In accordance with the research purpose, the following objectives are defined:

1. To examine existing TCC models used by Fortune 500 companies and to identify their key elements and implementation mechanisms.
2. To analyze internal organizational and external environmental factors that facilitate or hinder the transformation of corporate culture in small enterprises.
3. To formulate recommendations for implementing an adapted TCC model in small businesses.

Research Results

Under current conditions of globalization, digitalization, and increasing competitive pressure, corporate culture is increasingly recognized as a key intangible asset of organizations. The practices of leading Fortune 500 companies indicate that TCC is viewed not as a supportive process, but as a strategic tool for enhancing innovation, adaptability, and long term business sustainability. At the same time, small enterprises, despite their inherent organizational flexibility and close interaction with employees, generally lack systematized approaches to the formation and development of corporate culture, which reduces their capacity to respond effectively to changes in the external environment.

Table 1 presents an overview of corporate culture transformation models applied by Fortune 500 companies, with a focus on their potential adaptation for small enterprises.

Table 1

Fortune 500 Corporate Culture Models for Application in Small Businesses

Model Name	Approach Description	Adaptation for Small Business
Values-Led Model	Culture is shaped through the behavior and values of top management	In small businesses, the owner/manager demonstrates values through their actions, thereby shaping the culture
Integrated Communication Model	Focus on transparent, regular communication	Periodic meetings, feedback sessions, small group discussions
Employee Engagement in Change Model	Employees actively participate in defining values and processes	Small groups/teams collaboratively propose solutions and model values
Learning and Development Model	Systematic training to implement cultural changes	Short training sessions, mentoring sessions, knowledge sharing within the team
Flexible Process Model	Focus on rapid market responsiveness	Implementation of short planning and performance evaluation cycles

Source: Author's own development

The analysis results presented in Table 1 demonstrate the potential for effective adaptation of Fortune 500 corporate culture models to small business conditions while preserving their conceptual foundation. The Values-Led Model indicates that company culture is shaped by leadership behavior. In small enterprises, this is implemented through the direct example of the owner or manager, who demonstrates desired values and norms (Shpileva et al., 2025). Integrated communication ensures transparency and regularity in information exchange. In small business practice, this is achieved through meetings, feedback sessions, and small group discussions, which foster trust and team unity. Employee engagement in change transforms staff into active participants in shaping values and processes. In small businesses, this is accomplished through work in small groups and collaborative problem-solving (Kokhaniuk, 2025). The Learning and Development Model emphasizes the importance of systematic competency enhancement. In small organizations, this is realized through short training sessions, mentoring sessions, and knowledge sharing, integrating cultural changes into daily operations (Rynkevich, 2020). The Flexible Process Model cultivates readiness for rapid response to market changes. In small businesses, this is ensured by implementing short planning and performance evaluation cycles, establishing adaptability as an integral characteristic of corporate

culture.

Thus, all models are interconnected and complement each other, creating a comprehensive approach to forming a sustainable and developmental culture under conditions of limited resources. Further analysis of internal and external factors affecting small business corporate culture allows for deeper understanding of the conditions for implementing these models. Among internal factors, owner leadership plays a decisive role, as their managerial position and readiness for change determine the direction and pace of cultural transformation. In this context, adaptation of the "lead by example" principle, characteristic of Fortune 500 companies, serves as an effective mechanism for influencing organizational behavior.

The organizational structure of a small enterprise also significantly impacts transformation processes. On one hand, its simplified nature facilitates rapid implementation of changes; on the other hand, it requires clear role distribution to avoid managerial inconsistency. Equally important is the level of employee engagement, which, in the presence of trust and openness, can become a catalyst for change, yet in the absence of appropriate support mechanisms may become a source of hidden resistance (Dyyak, 2024). Resource constraints remain a significant limitation for small enterprises, necessitating an orientation toward low-cost cultural initiatives. In this context, formalization of mission and values is essential, as it enables alignment of daily management practices with long-term development objectives.

The external environment, characterized by high competition, rising customer expectations, and technological shifts, further intensifies the need for cultural adaptability. Borrowing customer-oriented and innovative approaches from Fortune 500 companies, along with consideration of social and regulatory requirements, contributes to forming a corporate culture capable of maintaining business sustainability without losing flexibility.

Recommendations for implementing an adapted corporate culture model in small enterprises emphasize the importance of integrating modern management approaches into daily practice. Transformation is viewed as an interconnected process where changes in management, communications, and personnel development mutually reinforce each other. The central element is owner micro-leadership, which builds employee trust and engagement. Employee involvement in value formation, effective communication, and development of the innovative component of culture promote organizational adaptability. Critical aspects include training, non-material incentives, and digitalization, which enhance transparency and efficiency of management processes.

Therefore, integration of these recommendations contributes to forming a holistic corporate culture oriented toward development, engagement, and adaptability, which increases operational efficiency and competitiveness of small businesses.

Conclusions

The research results demonstrate that Fortune 500 corporate culture transformation models contain core elements and implementation mechanisms that can be adapted to small business conditions. Their success depends on internal factors, such as owner leadership and employee engagement levels, as well as external conditions, particularly competition and technological

changes.

The study has established that integration of management approaches into daily practice, active employee participation in value formation, flexibility, training, and innovation implementation ensure effective corporate culture transformation and enable small enterprises to respond promptly to business environment challenges.

The scientific novelty lies in developing an adapted model that accounts for the specifics of small enterprises and emphasizes the role of micro-leadership and collective participation. The model opens prospects for further study of the impact of technological innovations and market trends on corporate culture development, while also providing practical recommendations for small business managers.

References

- Chobitok, V., & Kostrova, T. (2025). Korporatyvna kultura yak stratehichnyi resurs rozvytku pidpriemstva [Corporate culture as a strategic resource for enterprise development]. *Development Service Industry Management*, 3, 134-140. [https://doi.org/10.31891/dsim-2025-11\(20\)](https://doi.org/10.31891/dsim-2025-11(20)) [in Ukrainian]
- Dyyak, R. (2024). Korporatyvna kultura: teoretychni zasady ta praktychni aspekty formuvannia [Corporate culture: theoretical foundations and practical aspects of formation]. *Grani*, 27(6), 52-59. <https://doi.org/10.15421/1724112> [in Ukrainian].
- Kokhaniuk, Y. (2025). Korporatyvna kultura yak instrument transformatsii ahrarnykh pidpriemstv v umovakh yevrointehratsii [Corporate culture as a tool for transforming agricultural enterprises in the conditions of european integration]. *Scientific Notes of the University "KROK"*, 1(77), 388-397. <https://doi.org/10.31732/2663-2209-2025-77-388-397> [in Ukrainian].
- Rudachenko, O. O., Prasol, V. M., & Bazhanov, P. Yu. (2025). Korporatyvna kultura v systemi stratehichnoho rozvytku subiektiv pidpriemnytstva [Corporate culture in the system of strategic development of business entities]. *Development Service Industry Management*, 2, 251-256. [https://doi.org/10.31891/dsim-2025-10\(33\)](https://doi.org/10.31891/dsim-2025-10(33))
- Rynkevich, N. (2020). Rozvytok orhanizatsiinoi kultury v systemi menedzhmentu pidpriemstv kharchovoi promyslovosti [Development of organizational culture in the management system of the food industry enterprises]. *Agricultural and Resource Economics: International Scientific E-Journal*, 6(1), 123-145. <https://doi.org/10.51599/are.2020.06.01.09>
- Shpileva, V., Bezsikernykh, V., & Dumanetskyi, V. (2025). Suchasni napriamy rozvytku korporatyvnoi kultury [Modern directions of corporate culture development]. *Herald of Khmelnytskyi National University. Economic Sciences*, 344(4), 639-645. <https://doi.org/10.31891/2307-5740-2025-344-4-91>
- Shymanovska-Dianych, L., & Lakhyzha, R. (2025). Rozvytok IT-biznesu v Ukraini u fokusi stanovlennia korporatyvnoi kultury [IT business development in Ukraine through the lens of corporate culture formation]. *Sustainable Development of Economy*, 56(5), 459-467. <https://doi.org/10.32782/2308-1988/2025-56-63>



Critical Success Factors for Negotiations Between Small Producers and National Retail Chain Buyers

Kateryna Lapuzina ¹ 

¹ Master, Deputy Director, Maison Trade LLC, Kharkiv, Ukraine



Corresponding author:

sabina2704@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study provides a comprehensive analysis of critical success factors in negotiations between small producers and buyers of national retail chains in Ukraine amid martial law and retail market transformation. The methodology combines comparative analysis of leading retail chains' strategies, systematization of supplier requirements, and identification of effective negotiation practices. Findings show that successful integration depends on three components: strategic preparation focused on category value, tactical capability to build long-term partnerships, and operational supply reliability under infrastructure constraints. Results indicate heightened entry barriers caused by inflation, infrastructure damage, and stringent requirements. Negotiation success arises through product differentiation and pricing justification.

KEYWORDS: retail negotiations, small producers, Ukrainian retail chains, retail buyers, supplier strategy, pricing, partnership development, category management, wartime economy.

How to cite: Lapuzin, K. (2025). Critical Success Factors for Negotiations Between Small Producers and National Retail Chain Buyers. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 338-344). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.18168778>

Introduction

The transformation of Ukrainian retail under conditions of economic instability and armed conflict creates unprecedented challenges for small producers seeking market access through national retail chains. This situation aligns with global trends in supply chain resilience and production localization strategies (Bambrick et al., 2025). While Ukraine demonstrates notable resilience of the retail sector, it faces structural asymmetry in which large retail chains concentrate market power and dictate the terms of interaction with suppliers. This dynamic generates substantial entry obstacles for small producers attempting to integrate into contemporary distribution channels (Heorhiadi & Holyak, 2024). Strategic negotiation competencies constitute a critical factor for the survival and development of small producers, particularly in contexts characterized by limited resources and heightened operational risks (Zrybnieva, 2024). In recent years, Ukrainian retail has developed a concentrated structure in which leading national chains set high entry standards for suppliers, including stringent requirements related to production scale, supply stability, documented compliance with quality standards, and the capacity to support marketing initiatives (Vykykach, Kniaz, & Rusyn-Hrynyk, 2024). The management of resource flows in enterprises operating within network retail requires an integrated approach that accounts for technological innovation, supply quality, resilience of supplier networks, digital integration, and customer orientation (Heorhiadi & Holyak, 2024). The digitalization of business processes and the integration of online platforms create new opportunities for small producers to optimize communication with retailers and to expand channels of interaction (Zaruba, 2024). Previous studies report mixed findings regarding the determinants of success in negotiations between suppliers and retailers. Kupriienko et al. (2025) emphasize the importance of price competitiveness and production scale, while other studies highlight the growing role of nonprice factors, including product innovativeness, supply stability, and the level of digitalization of business processes. Understanding consumer behavior and neuropsychological responses to different content formats is becoming a critical component in the development of effective communication strategies and product presentations during negotiations with retailers (Tytarenko, 2025). Research on critical success factors in supply chains indicates that negotiation effectiveness is shaped by a complex system of interrelated elements, encompassing operational efficiency, strategic planning, and customer orientation (Bambrick et al., 2025). Methodological limitations of existing studies include insufficient analysis of negotiation dynamics under conditions of asymmetric power between small producers and large retailers, as well as the lack of integration of strategic and tactical negotiation dimensions within a unified analytical framework. The study of effective negotiation strategies is of particular importance in the context of martial law and macroeconomic instability. Negotiation management requires thorough preparation, trust building, clear goal definition, and a win-win orientation that enables adaptation to changing conditions (Zrybnieva, 2024). The development of professional competencies demands a systematic approach that integrates theoretical training with practical experience and the adaptation of international practices to national specificities (Ratii, 2025). However, the existing scholarly literature provides limited insight into the adaptation of negotiation strategies by small producers under crisis conditions and their impact on successful long-term integration into national retail networks, creating a gap in understanding the optimal architecture of the negotiation process and the critical success factors for resource-constrained suppliers.

Research Aim and Research Questions

The purpose of this study is a comprehensive analysis of the critical success factors in negotiations between small producers and buyers of national retail chains in Ukraine through the systematization of strategic and tactical approaches, the assessment of leading retailers' requirements, and the identification of key competencies for effective integration into network retailing. The study covers an analysis of negotiation practices with major national retail chains (ATB-Market, Silpo/Fozzy Group, Novus, Epicentr, Rozetka) under conditions of martial law and economic transformation, with a focus on identifying differences in the requirements of various retailer categories and adapting negotiation strategies to the specific features of the Ukrainian market.

The methodological framework is based on the integrated use of qualitative analysis methods, systematization of empirical data, and comparative research. A structural-functional analysis method is applied to classify critical success factors by organizing negotiation elements across levels (strategic, tactical, operational) and by types of influence on the negotiation position. The analysis of retail chain requirements is conducted using publicly available information on cooperation terms, quality standards, and operational requirements of leading retailers. The systematization of strategic and tactical negotiation approaches is presented in tabular form according to success factor criteria, practical application, and expected outcomes.

The limitations of the study include the lack of comprehensive statistical data on negotiation outcomes due to the confidentiality of commercial information and restrictions on public disclosure of contract terms between suppliers and retailers.

Research Results

In 2025, the Ukrainian retail sector demonstrates resilience, generating a total revenue of **€936** billion in the first half of the year, representing a 17% increase compared with the previous year. However, small manufacturers face significant challenges when entering retail chains due to wartime disruptions, including infrastructure damage, power outages, and an accelerated inflation rate of 13.4% per annum (Agroreview, 2025). These factors create additional barriers for new market entrants and underscore the importance of a strategic approach to negotiations with major retailers.

This market dynamic defines the context in which the leading national retail chains in Ukraine operate. These include ATB-Market (the turnover leader), Silpo/Fozzy Group, Novus, Metro Cash & Carry, Epicenter, Aurora, Rozetka, Comfy, and Eva. Despite the diversity of formats, these chains share similar requirements for suppliers, including legal registration in Ukraine, documented compliance with safety and quality standards, stable production capacity to ensure uninterrupted deliveries to regional distribution centers, competitive wholesale pricing, and readiness to provide marketing support (Agroreview, 2025).

The specific requirements of each retail chain are presented in Table 1, which highlights differences in strategic priorities depending on the retailer's specialization.

Table 1

Characteristics of Major National Retail Chains in Ukraine and Their Supplier Requirements

Retail chain	Specialization	Key supplier requirements
ATB-Market	Food products and FMCG	Large-scale supply capacity, competitive wholesale pricing, ability to ensure uninterrupted deliveries to regional distribution centers
Silpo/Fozzy Group	Food products	Documented compliance with quality and safety standards, Ukrainian origin of products, readiness to provide marketing support
Novus	Premium food products	More than 70 percent Ukrainian assortment, high quality standards, stable production capacity
Epicenter	Construction materials and home improvement goods	Technical documentation, product certification, legal registration in Ukraine
Rozetka	Omnichannel retail (electronics and household appliances)	Logistics capabilities, digital integration of accounting and order management systems, competitive pricing

Source: Compiled by the author based on publicly available information from leading Ukrainian retail chains and an analysis of supplier requirements.

Understanding these differences forms the foundation for effective negotiation preparation. Successful small producers enter negotiations with clearly defined goals and fallback positions, focusing on a few high-impact variables such as pricing levels, volume commitments, delivery windows, and promotional support. They demonstrate how their product will enhance the retailer's category profit rather than merely disputing unit costs. This approach requires a deep understanding of the retail chain's business model and strategic priorities.

Negotiation leverage is created through unique value, including differentiated products, robust consumer data, or attractive margins. Small producers must quantitatively assess the impact of proposed pricing and promotional structures on the profits of both parties, using consumer and point-of-sale data. This is particularly important in the context of high competition and the resource constraints of the Ukrainian market (TradeBeyond, 2016). A systematization of the key elements of a successful negotiation strategy is presented in Table 2.

Table 2

Critical Success Factors for Negotiations Between Small Producers and Retail Chain Buyers

Success Factor	Description	Practical Application
Clear negotiation objectives	Defined priorities and walk-away points with a focus on a limited number of high-impact variables	Concentration on 2-3 key parameters (pricing levels, volume commitments, delivery windows, promotional support)
Unique product value	Creation of negotiating power through differentiation from competitors	Innovative products, local production, strong consumer data, attractive retailer margins

Quantitative proposition justification	Demonstration of impact on retailer category profitability using data	ROI calculations, category analysis, quantitative assessment of pricing and promotional structure impacts on both parties' profits
Long-term partnership	Strategic approach to relationships with a focus on collaborative problem-solving	Joint business planning, transparent communication, positioning discussions as supply chain optimization
Operational reliability	Consistent delivery at high service levels and responsiveness	Supply stability under infrastructure challenges, justifying preferential terms and greater shelf space

Source: systematized by the author based on analysis of negotiation practices and scientific research (Zrybnieva, 2024; Bambrick et al., 2025; Heorhiadi & Holyak, 2024).

The factors presented in Table 2 are implemented through specific negotiation tactics in which relationship building plays a critical role. Successful suppliers treat retailers as long-term partners, prioritize transparency, and position discussions as collaborative problem-solving around costs, inventory, and service. Instead of confrontational bargaining, they ask: "How can we jointly reduce total supply chain costs so both parties benefit?" This approach is particularly effective during wartime conditions, when collaboration becomes key to survival. At a practical level, successful negotiators structure agendas in advance, keep meetings focused on solutions, anticipate common buyer tactics (such as last-minute concessions or price anchoring), and prepare data-driven counterarguments. They avoid bluffing, which can be easily undermined by another low-cost competitor, particularly relevant in the highly competitive Ukrainian market. Long-term consistent delivery at high service levels, reliability, and responsiveness become key success factors, as these justify preferential terms, greater shelf space, and more collaborative joint business planning with retailers. Under the unstable conditions of 2025, when infrastructure damage and energy disruptions create additional challenges, supply reliability becomes even more valuable to retail chains.

Conclusions

The analysis confirms the formation of a complex negotiation system in Ukraine between small producers and national retail chains, characterized by structural power asymmetry and requiring a comprehensive approach from suppliers through strategic preparation (demonstrating value to the retailer's category), tactical proficiency (building long-term partnerships), and operational reliability (stable supply under wartime challenges).

Despite growth in the retail sector and increased demand for local production under martial law, small producers face significant entry barriers due to stringent retailer requirements. Differentiation in requirements among leading chains (ATB-Market – scale and low prices; Silpo/Novus – quality and Ukrainian origin; Epicentr – technical documentation and certification; Rozetka – digital integration and logistics capabilities) contrasts with the limited resources of small producers and necessitates adaptation of negotiation strategies to the specific characteristics of each retailer.

Negotiation effectiveness is determined not only by price competitiveness but also by the supplier's ability to create unique value. Martial law, infrastructure damage, and digitalization of communications have transformed negotiation priorities, increasing the importance of supply

reliability, transparency in interactions, and readiness for collaborative problem solving in the supply chain. At the same time, the development of digital platforms, growing consumer loyalty to Ukrainian brands, and retailers' emphasis on strategic partnerships create new opportunities for small producers in niche segments such as organic products, innovative solutions, local production, and rapid market adaptation.

To strengthen the negotiation position of small producers, it is recommended to develop competencies in quantitatively justifying the impact on retailer category profitability; invest in product differentiation through innovation, quality, and standard certification; build long-term partnerships through transparent communication and a win-win approach; and ensure operational reliability and digital integration to enhance competitiveness. Implementing these recommendations can significantly strengthen small producers' positions in negotiations with national retail chains and support their successful integration into modern distribution channels.

References

- Agroreview. (2025, December 9). *Largest retailers in Ukraine in 2025: Ranking by revenue for the first half of the year*. Retrieved from <https://agroreview.com/en/newsen/largest-retailers-ukraine-2025-ranking/>
- Bambrick, S., Vafadarnikjoo, A., Reid, I., & Bamford, D. (2025). Unpacking critical success factors to improve supply chain effectiveness, efficiency and performance: a 7Vs framework for consideration. *Production Planning & Control*, 36(4), 521-535. <https://doi.org/10.1080/09537287.2023.2286282>
- Heorhiadi, N., Holyak, A. (2024). Faktory vplyvu na optymizatsiiu resursnykh potokiv pidpriemstv v umovakh rozvytku merezhevoi torhivli [Influential factors on the optimization of resource flows for enterprises in the conditions of network trade development]. *Ekonomika ta suspilstvo - Economy and Society*, (61). <https://doi.org/10.32782/2524-0072/2024-61-37> [in Ukrainian].
- Kupriienko, K., Ungurian, M., Kyrlyuk, A. (2025). Tsyfrovi komunikatsii v marketynhu: rozvytok sotsialnykh merezh yak providnoho kanalu brendovoi vzaiemodii [Digital Communications in Marketing: The Development of Social Media as a Leading Brand Engagement Channel]. *Aktualni pytannia ekonomichnykh nauk - Current Issues of Economic Sciences*, (13). [in Ukrainian]. <https://doi.org/10.5281/zenodo.16750311>
- Ratii, A. (2025). Mentorship model for the development of environmental culture in future fashion designers. *Pedahohichna Akademiia: naukovi zapysky - Pedagogical Academy: Scientific Notes*, (21). <https://doi.org/10.5281/zenodo.16976360>
- TradeBeyond. (2016, October 13). *Your guide to improving retailer and supplier negotiation*. Retrieved from <https://www.tradebeyond.com/blog/a-powerful-guide-to-improve-retailer-and-supplier-negotiation>
- Tytarenko, Y. (2025). Neuropsychological reactions to vertical and horizontal video content in consumer behavior: a theoretical and economic analysis. *Aktualni pytannia ekonomichnykh nauk - Current Issues of Economic Sciences*, (17). <https://a->

economics.com.ua/index.php/home/article/view/890/878

- Vykrykach, M., Kniaz, S., Rusyn-Hrynyk, R. (2024). Faktory vplyvu na formuvannia i rozvytok transferneho potentsialu torhovelnykh pidpriemstv [Factors influencing the formation and development of the transfer potential of trade enterprises]. *Ekonomika i rehion - Economics and Region*, 1(92), 103-108. [https://doi.org/10.26906/eir.2024.1\(92\).3315](https://doi.org/10.26906/eir.2024.1(92).3315) [in Ukrainian].
- Zaruba, T. (2025). Economic advantages of using online platforms for booking and selling makeup services. *Zdobutky ekonomiky: perspektyvy ta innovatsii*, (22). <https://doi.org/10.5281/zenodo.17190879>
- Zrybnieva, I. (2024). Analiz stratehii vedennia perehovoriv u sferi upravlinnia marketynhovymy proiektamy [Analysis of negotiation strategies in the field of marketing project management]. *Ekonomika ta suspilstvo - Economy and Society*, (68). <https://doi.org/10.32782/2524-0072/2024-68-10> [in Ukrainian].



Adapting the Experience of Bosnia and Herzegovina, Croatia, and Kuwait to the Expert Calculation of Reparations for Ukraine

Oleksandr Kostyen 

¹Forensic Economic Expert
(Certificate No. 1915, issued
December 15, 2017), Limited
Liability Company "Research
Information and Consulting
Center" (EDRPOU code
39454731), 24 Voloska St.,
office 10, Kyiv, 04070, Ukraine

✉ **Corresponding author:**
oleksandr.kostyen@gmail.com



This work is licensed under CC BY-NC-ND 4.0.
To view a copy of this license, visit
<https://creativecommons.org/licenses/by-nc-nd/4.0>

ABSTRACT: This study analyzes international approaches to determining, assessing, and recovering reparations using the examples of Bosnia and Herzegovina, Croatia, and Kuwait, and possibilities for adapting this experience to expert calculation of reparations for Ukraine's war damages. The aim is to compare evidence collection mechanisms and assessment of material and non-material damages and to substantiate adaptation possibilities for Ukraine's claim system. Comparative legal and statistical methods were applied. The results demonstrate the effectiveness of the centralized United Nations mechanism in Kuwait and the potential of its elements for improving the Ukrainian system through standardized evidence, digital coordination, and reduced processing times.

KEYWORDS: international compensation mechanisms, damage assessment, evidentiary standards, post-conflict recovery, digital claims registry, expert assessment, comparative legal analysis, damage compensation methodology

How to cite: Kostyen, O. (2025). Adapting the Experience of Bosnia and Herzegovina, Croatia, and Kuwait to the Expert Calculation of Reparations for Ukraine. *International Conference on Economic Sciences and Management in the Changing World 2025*, (pp. 345-350). Futurity Research Publishing. <https://doi.org/10.5281/zenodo.20830001>

Introduction

Russia's armed aggression against Ukraine underscores the need to develop a unified system for assessing and compensating the damages inflicted, encompassing both material and non-material

losses. In this context, the analysis of international experience in determining and implementing reparations takes on particular significance, including the practices of Bosnia and Herzegovina, Croatia, and Kuwait, which reflect different institutional and methodological approaches to organizing evidence collection, expert assessment, and compensation procedures, and which have already been the subject of research within the framework of international law on post-conflict recovery and the practice of the United Nations Compensation Commission.

The research problem lies in the absence of a unified methodology for calculating damages in Ukraine under conditions of the simultaneous operation of international initiatives and national mechanisms for documenting harm, which complicates the standardization of approaches to assessing reparation claims (Council of Europe, n.d.; World Bank Group, 2025).

Prior studies indicate that the individualized judicial models characteristic of Bosnia and Herzegovina and Croatia ensure detailed determination of material and non-material harm on the basis of expert conclusions, yet have limited scalability in mass post-conflict situations (International Criminal Tribunal for the Former Yugoslavia, n.d.).

By contrast, the Kuwaiti model of the United Nations Compensation Commission demonstrates the effectiveness of centralized processing of mass claims through unified damage categories and standardized evidentiary procedures, which made it possible to process millions of claims within a single institutional system (United Nations Compensation Commission, 2022; United Nations Compensation Commission, 2023).

Thus, there is both a scholarly and practical need for a comparative synthesis of these approaches in order to determine their potential for shaping a modern Ukrainian model of expert calculation of reparations, which accounts for the relevance and scholarly interest of this study.

Research Aim and Research Questions

The aim of the study is to analyze international experience in the determination, assessment, and recovery of reparations using the examples of Bosnia and Herzegovina, Croatia, and Kuwait, and to substantiate the possibilities for its adaptation in order to improve the methodology for expert calculation of reparations for damages inflicted on Ukraine as a result of Russia's armed aggression.

Research objectives:

1. Analysis of the legal and methodological approaches to damage assessment and the determination of reparations applied in Bosnia and Herzegovina, Croatia, and Kuwait following armed conflicts and internationally wrongful acts.
2. Comparative analysis of the mechanisms for evidence collection, expert assessment of material and non-material damages, and compensation procedures in the countries under consideration, as well as current practice in documenting damages in Ukraine.
3. Substantiation of recommendations for adapting the most effective elements of international experience to form a comprehensive system for the expert calculation and verification of Ukraine's reparation claims.

Research Methodology

The methodological basis of the study comprises comparative legal, systemic, and structural-functional approaches, as well as the methods of analysis, synthesis, generalization, content analysis, and descriptive statistics. The source base consists of decisions and reports of the United Nations Compensation Commission (1991 to 2022), documents of the Register of Damage for Ukraine (2024 to 2025), materials of the Council of Europe concerning the international compensation mechanism for Ukraine (2023 to 2025), reports of the World Bank, the United Nations, the European Commission, and the Government of Ukraine RDNA3 (2024) and RDNA4 (2025), as well as scholarly publications from 2020 to 2025. The temporal scope of the study covers the period from the establishment of the United Nations Compensation Commission in 1991 to 2025. Kuwait, Bosnia and Herzegovina, and Croatia were selected for comparative analysis based on the criteria of having established compensation mechanisms, documented practice in assessing material and non-material damages, and the relevance of their experience to Ukraine. Kuwait represents a centralized international model of reparations, Bosnia represents a judicial-individualized model, and Croatia represents a mixed model of compensation, allowing for a comparison of the principal approaches to damage compensation. Other post-conflict jurisdictions were not included due to the lower comparability of their mechanisms with Ukraine's current needs. Descriptive statistics are used to summarize official data on compensation mechanisms but do not allow for establishing causal relationships between legal instruments and the effectiveness of their application, which constitutes the main limitation of the study.

Research Results

In Kuwait, the United Nations Compensation Commission processed 2.69 million claims with a total claimed amount of 352.5 billion US dollars, of which compensation was awarded for 1.5 million claims totaling 52.4 billion US dollars. Thus, approximately 56 percent of the submitted claims were satisfied, while the volume of awarded compensation amounted to approximately 15 percent of the total claimed amount (United Nations Compensation Commission, 2022; United Nations Compensation Commission, 2023).

In Bosnia and Herzegovina and Croatia, a judicial-individualized model for determining reparations is applied, under which the amount of material and non-material harm is established by the court separately in each case based on an assessment of the totality of evidence. Such evidence includes court decisions, expert conclusions regarding the value of destroyed or damaged property, documents from state authorities, medical records, and the testimony of victims and witnesses. The individualized nature of judicial proceedings ensures that the specific circumstances of the harm caused and its consequences for each person are taken into account; however, it simultaneously complicates the standardization of damage assessment procedures and prolongs the process of obtaining compensation (TRIAL International, 2015).

In Ukraine, as of May 2025, 30,000 claims have been submitted to the Register of Damage, with 10 categories of claims opened, while the total number of compensation categories exceeds 40,

indicating the gradual expansion of the compensation mechanism (Register of Damage for Ukraine, n.d.; Ministry of Justice of Ukraine, n.d.).

The practice of post-conflict states demonstrates that the effectiveness of damage compensation mechanisms largely depends on the quality of evidence collection, the approaches applied to damage assessment, and the institutional support of these processes. A summary of the corresponding tools used in international practice is presented in Table 1.

Table 1

Mechanisms for Evidence Collection and Damage Assessment

Country	Main Sources of Evidence	Damage Assessment Method	Compensation Mechanism
Kuwait	Claims submitted by individuals, companies, and states	Expert analysis by damage category	United Nations Compensation Commission
Bosnia and Herzegovina	Court records, testimony, expert examinations	Individualized expert assessment	National and international courts
Croatia	Damage assessment reports, judicial evidence	Expert assessment of property damage	Judicial and state mechanisms
Ukraine	Digital claims, documents, photo and video evidence, state registers	Documentation through the Register of Damage and expert calculations	Register of Damage and future Compensation Commission

Source: compiled by the author based on United Nations Compensation Commission (2022, 2023), Council of Europe (n.d.), Register of Damage for Ukraine (n.d.), Ministry of Justice of Ukraine (n.d.), World Bank Group (2025).

As shown in Table 1, international experience demonstrates an evolution in approaches to documenting and assessing damages, from traditional procedures based on paper evidence and judicial expert examinations to digital systems for collecting and verifying information. While in Bosnia and Herzegovina and Croatia judicial procedures and individualized expert assessment of each case play the key role, and the Kuwaiti model was based on the centralized review of claims by a specially established international commission, the Ukrainian approach combines modern digital tools for documenting harm with the development of an international compensation mechanism. This transformation reflects a gradual shift from predominantly reactive compensation models toward the systematic accumulation of an evidentiary base, which enables comprehensive accounting of damages and creates the preconditions for their subsequent compensation under international law.

The comparison of the practical operation of international and national compensation models should be supplemented by an analysis of their quantitative results (Table 2), which makes it possible to assess the scale of the claims considered, the volume of compensation paid, and the effectiveness of the implementation of the relevant mechanisms across different countries.

Table 2

Quantitative Indicators of Compensation Mechanisms

Indicator	Kuwait	Ukraine
Number of claims submitted, units	2.69 million	30,000
Number of claim categories, units	6	over 40
Amount of claims submitted, billion US dollars	352.5	being formed
Amount of compensation awarded, billion US dollars	52.4	no payments made

Source: compiled by the author based on United Nations Compensation Commission (2022, 2023), Register of Damage for Ukraine (n.d.), Ministry of Justice of Ukraine (n.d.), and World Bank Group (2025).

As the data in Table 2 indicate, substantial differences exist between Kuwait's international experience and the current Ukrainian approach, both in the scale of implementation of compensation mechanisms and in the stage of their development. The Kuwaiti model is characterized by a completed cycle of claim review, within which millions of claims were processed and multibillion-dollar compensation payments were made according to clearly defined claim categories. By contrast, the Ukrainian system is at the stage of accumulating an evidentiary base and developing an international compensation mechanism, which explains the absence of actual payments at the present stage. At the same time, the considerably broader range of claim categories indicates an effort to ensure comprehensive coverage of the various types of harm caused by armed aggression, which may provide a foundation for a more detailed and equitable system of future reparations.

The practical adaptation of international experience involves the use of centralized coordination and standardized claim classification based on the Kuwaiti model, judicial-expert individualized assessment of complex cases based on the model of Bosnia and Herzegovina and Croatia, and the digital integration of registers and automated verification of evidence based on the current Ukrainian model. Combining these elements may increase the effectiveness of the future system for recovering reparations for damages inflicted on Ukraine.

Thus, the scholarly contribution of the study lies in systematizing international experience in the determination, assessment, and recovery of reparations using the examples of Bosnia and Herzegovina, Croatia, and Kuwait, conducting a comparative analysis of the mechanisms for evidence collection, expert assessment of material and non-material damages, and compensation procedures, and providing scholarly substantiation of the possibilities for adapting the most effective elements of these models to Ukrainian practice. The proposed comprehensive approach combines centralized coordination of compensation processes, standardized classification of damages, judicial-expert assessment of complex cases, and digital mechanisms for documenting evidence, which creates a methodological foundation for improving the system of expert calculation and verification of Ukraine's reparation claims for damages caused by Russia's armed aggression.

Conclusions

The comparative analysis demonstrated that the centralized international model of Kuwait is the most suitable for the mass processing of claims, as it ensures the standardization of procedures and a high throughput of claim processing. The judicial-expert model of Bosnia and Herzegovina and Croatia is appropriate for the individualized determination of complex material and non-material damages, while the Ukrainian digital registry system creates a foundation for the rapid accumulation and verification of evidence. Combining centralized coordination, digital documentation, and expert assessment may constitute the optimal model for developing an international mechanism for the recovery of reparations for damages inflicted on Ukraine as a result of Russia's armed aggression.

References

- Council of Europe. (n.d.). *Register of damage for Ukraine*. <https://rd4u.coe.int/en/>
- International Criminal Tribunal for the Former Yugoslavia. (n.d.). *International Criminal Tribunal for the Former Yugoslavia*. <https://www.icty.org/>
- Ministry of Justice of Ukraine. (n.d.). *International compensation mechanism for compensation of damage caused by the aggression of the Russian Federation against Ukraine*. <https://mfa.gov.ua/en/news/verhovna-rada-ukrayini-ratifikuvala-konvenciyu-pro-stvorenniya-mizhnarodnoyi-kompensacijnoyi-komisiyi-dlya-ukrayini>
- The Nuhanovic Foundation. (n.d.). *TRIAL report: Enforcement of damage compensation claims of victims of war crimes in criminal proceedings in Bosnia and Herzegovina: Situation, challenges and perspectives*. <https://nuhanovicfoundation.org/database/2015-trial-report-enforcement-of-damage-compensation-claims-of-victims-of-war-crimes-in-criminal-proceedings-in-bosnia-and-herzegovina-situation-challenges-and-perspectives/>
- United Nations Compensation Commission. (2022). *Final report of the Governing Council of the United Nations Compensation Commission*. <https://uncc.un.org/en/important-notice>
- United Nations Compensation Commission. (2023). *Report and recommendations made by the Panel of Commissioners concerning part one of the claims for damages above USD 100,000 (Category E claims)*. <https://uncc.un.org/en/what-we-did/claims/category-e>
- World Bank Group. (2025, February 25). *Updated Ukraine recovery and reconstruction needs assessment released*. <https://www.worldbank.org/en/news/press-release/2025/02/25/updated-ukraine-recovery-and-reconstruction-needs-assessment-released>

Directions for Increasing Production Along the Value-Added Chain in the Petrochemical Industry of Azerbaijan in the Context of Sustainable Development Shafa Aliyev	5–14
China’s Belt and Road Initiative: Opportunities and Challenges for International Business Khan Munazza Jamshed, Abdullah Ali Jameel Alabd Rahman, Jawad Ul Hassan	15–20
BRICS and the Transformation of Global Financial Governance: Challenging the Bretton Woods Institutions Opeoluwa Adisa Oluyemi.....	21–35
Current Problems of Regulation of Financial Mechanisms in Azerbaijan Technoparks Hamid Huseynzade	36–48
Administrative Procedure Reform in Vietnam during the 2011–2020 Period Nguyen Minh Quan, Dang Thi Minh Phuong.....	49–62
A Systemic Framework for Evaluating Competitive Intensity in the Agricultural Supply Chain Anar Bayramov	63–69
Insider Threats: The Role of HR in Mitigating Internal Cyber Risks Diana Ussher-Eke	70–82
The Role of Supportive Leadership in Innovative Marketing Performance: Marketing Proactive Behaviour as a Mediator Layla Mohsen Hassan Al-Hakeem, Amjad H. Ismail, Mohammed Awad Jarallah, Ahmed Muhammadridha Abdulrasool, Ahmed Abdullah Amanah.....	83–94
The Impact of Government Policies on Business Strategy: A Comparative Study of Emerging and Developed Economies Syeda Sana Gillani, MD Shafiqul Islam.....	95–100
Why Women Work Harder Than Men: Gender Norms, Patrilocality, and Labor Market Inequalities in Kazakhstan and Kyrgyzstan Irina Kovaleva, Alma Kudebayeva, Gerald Pech.....	101–108
The Impact of Electronic Financial Services on the Profitability of the Banking Sector in Kosovo Besmir Çollaku.....	109–117
Revocation of the Mandate as a Participatory Governance Tool to Strengthen the Quality of Local Government in Hidalgo, Mexico Luis Gerardo González Gordillo.....	118–127
Management and Utilisation of Digital Data in Vietnam's Natural Resources and Environment Sector: Current Status, Challenges and Solutions Nguyen Van Bau.....	128–137
Standards for Sustainable Tourism: Insights on Accessibility and Inclusivity Maria Gianni, Sofia Gkarane, Zacharias Papanikolaou, Apostolos Goulas, Ilias Tsotsas	138–146

Assessing Budgetary Performance and Efficiency in Albania's Road Transport Investments (2013–2023)

Vilma Bilaj, Elida Liko..... **147–151**

Digital Transformation, Artificial Intelligence & Sustainability in Management and Economics: A Bibliometric Analysis with VOSviewer Mapping

Zacharias Papanikolaou, Apostolos Goulas, Ilias Tsotsas, Maria Gianni **152–156**

Cooperation for Innovation: Main Drivers in Countries with Low Levels of Innovation

Carlos Labarcés-Ballestas, Ángel Peiró-Signes..... **157–162**

The Interaction Transition – Local Development: Contribution of Social Capital in Local Development

Florina Popa **163–175**

Strategic Management of Locally-Driven Tourism Events for Destination Sustainability

Sofia Gkarane, Maria Gianni, Apostolos Goulas, Ilias Tsotsas, Zacharias Papanikolaou **175–180**

Administrative Capacity for Project Pipeline Development and Management under Cohesion Policy in Albania

Sonil Bilaj, Valeria Valeri **181–187**

Integrating Design for Manufacturing, Assembly, and Disassembly to Accelerate Circular Economy in Construction: A Conceptual Framework

Thuy Binh Pham **188–194**

Artificial Intelligence and Consumer Behaviour: A Bibliometric Review

Sarah Makraz, Wadi Tahri..... **195–198**

Rethinking Agribusiness in the Digital Era

Apostolos Goulas, Ilias Tsotsas, Zacharias Papanikolaou, Maria Gianni **199–204**

Digital Transformation of Logistics and Financial Systems through AI-Based Predictive Models and Risk Management

Oksana Savchuk **205–209**

Intelligent Systems for Transport Logistics Optimisation: Algorithms, Architecture, and Legal Aspects

Andriy Drozd **210–213**

Leadership Change and Stock Market Response: An Event Study of Indonesia's Ministerial Transition in 2025

Oktavera Rizki **214–222**

Economic Assessment of the Impact of Biodiversity on the Productivity of Organic Agricultural Systems

Gennady Tveritinov **223–230**

Cross Perspectives on Support in Entrepreneurship: Trends and International Best Practices

Ibenchekroun Salma S., El Hissi Youmna Y..... **231–235**

Understanding Media as a Prerequisite for Developing Crisis Communication Strategies: Evidence from a National Consumer Panel

Martina Mikrut Nađsombat, Ksenija Lukić, Lucija Živković **236–241**

Sustainability Transitions in Agriculture and Food Systems: A Global Bibliometric Study Ilias Tsotsas, Apostolos Goulas, Zacharias Papanikolaou, Maria Gianni	242–247
Employment Tax and Cybersecurity Risks: Threats of a Tax Season Olubukola Sanni	248–258
Transparency in Accounting and Financial Reporting within Central Banks Wisam Hasan Ahmed Zaini	259–268
Harnessing Agentic AI for Sustainable Innovation and Environmental Responsibility Jessy Christadoss, Manas Ranjan Panda	269–280
Intelligent Geographic Information and Management Systems in Modern Logistics and Digital Infrastructures: Architectural, Legal and Security Aspects Markiyana Doroshenko	281–286
State and Donor Financing as Drivers of Startup Ecosystem Development in Albania Olta Milova, Blerina Hoxha	286–297
ESG Implementation in Vietnamese Commercial Banks Ha Thi Thu Do	297–301
Authentication of Electronic Evidence Derived from Digital Transactions and Communications Nguyen Thanh Minh Chanh	302–309
The Legal Framework on Time Limits for Pre-Trial Preparation in Commercial Cases in Vietnam: Current Situation and Reform Directions Nguyen Thanh Minh Chanh, Dang Thi Minh Phuong	310–317
The Impact of ESG Indices on the Investment Attractiveness of Companies in Sustainable Business Environments Halyna Mieniyailova, Maryna Kharchenko, Victoria Krush	318–324
State Promotion of Innovation Activity as a Factor of Ukraine's Investment Attractiveness Maksym Zhylytsov	325–332
Fortune 500 Corporate Culture Transformation Model for Application in Small Businesses Hennadii Pysanko	333–337
Critical Success Factors for Negotiations Between Small Producers and National Retail Chain Buyers Kateryna Lapuzina	338–344
Adapting the Experience of Bosnia and Herzegovina, Croatia, and Kuwait to the Expert Calculation of Reparations for Ukraine Oleksandr Kostylen	345–350



Proceedings Volume: International Conference on Economic Sciences and Management in the Changing World 2025 (ICESMCM 2025)

ISBN 978-83-969744-1-9

Dates: November 7-9, 2025

Organizer: Futurity Research Publishing and Pylyp Orlyk International Classical University

The International Conference on Economic Sciences and Management in the Changing World 2025 (ICESMCM 2025) is a global academic event jointly organized by Pylyp Orlyk International Classical University (Ukraine) and Futurity Publishing (Poland). This international partnership brings together academic excellence and professional publishing to promote innovative research and cross-border collaboration. It covers a wide of topics including economic theory, business strategy, finance, entrepreneurship, public policy, and organizational development. Participants are invited to present research and exchange ideas on how economic and managrial ractices evolve in response to global transformations.

