LUTSK NATIONAL TECHNICAL UNIVERSITY

ECONOMIC FORUM

Volume 16, No. 2, 2026

Year of foundation: 2011
Frequency: 4 issues per year

Lutsk
2026

ISSN 2308-8559
e-ISSN 2415-8224

Founder and publisher:
Lutsk National Technical University

Year of foundation: 2011

Recommended for printing and distribution
via the Internet by the Academic Council
of Lutsk National Technical University
(Minutes No. 12 of May 28, 2026)

State registration:
Decision of the National Council of Television
and Radio Broadcasting of Ukraine No. 40 of 11.01.2024
Media identifier – R30-02529.

The scientific journal is included in category "B" of the List of scientific specialised publications of Ukraine, in which can be published the results of dissertations for obtaining the scientific degrees of doctor and candidate of sciences in specialties: 0311 – Economics; 0412 – Finance, Banking, and Insurance; 0413 – Management and Administration; 0414 – Marketing and Advertising (Order of the Ministry of Education and Science of Ukraine No. 928 dated 11.06.2026).

Journal cluster: Economic transformation, business and administration.

The journal is presented international scientometric databases, repositories and scientific systems: Vernadsky National Library of Ukraine, Dimensions, Ulrichsweb Global Serials Directory, University of Oslo Library, University of Hull Library, Polska Bibliografia Naukowa, OUCI (Open Ukrainian Citation Index), Sherpa/Romeo, Litmaps, J-Gate, EconStor, ERIH PLUS (European Reference Index for the Humanities), SUDOC (Système Universitaire de Documentation), OpenAlex, EZB – Electronic Journals Library

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ЛУЦЬКИЙ
НАЦІОНАЛЬНИЙ
ТЕХНІЧНИЙ
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ЕКОНОМІЧНИЙ ФОРУМ

Том 16, № 2, 2026

Заснований у 2011 році
Видається чотири рази на рік

Луцьк
2026

ISSN 2308-8559
e-ISSN 2415-8224

Засновник та видавець:
Луцький національний технічний університет

Рік заснування: 2011

Рекомендовано до друку та поширення
через мережу Інтернет Вченою радою
Луцького національного технічного університету
(протокол № 12 від 28 травня 2026 р.)

Державна реєстрація:
Рішення Національної ради України
з питань телебачення і радіомовлення № 40 від 11.01.2024
Ідентифікатор медіа – R30-02529.

Науковий журнал включено до категорії «Б» Переліку наукових фахових видань України,
у яких можуть публікуватися результати дисертаційних робіт на здобуття наукових ступенів
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(наказ Міністерства освіти і науки України № 928 від 11.06.2026).

Кластер журналу: Економічні перетворення, бізнес та адміністрування.

**Журнал представлено у міжнародних наукометричних базах даних,
репозитаріях та пошукових системах**: Національна бібліотека України імені В. І. Вернадського,
Dimensions, Ulrichsweb Global Serials Directory, University of Oslo Library,
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ECONOMIC FORUM

Journal homepage: https://e-forum.com.ua/en
Vol. 16, No. 2, 2026

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ECONOMIC FORUM
Journal homepage: https://e-forum.com.ua/en
Vol. 16, No. 2, 2026, 8-22
ISSN 2308-8559
e-ISSN 2415-8224
Article's History: Received: 12.01.2026 Revised: 20.04.2026 Accepted: 28.05.2026 Published: 25.06.2026

UDC 336.761:330.322(438)"1989/2026"
DOI: 10.62763/ef/2.2026.08

The role of the stock exchange infrastructure in attracting investments into the country's economy using the example of the Republic of Poland (1989–2026)

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Abstract. The purpose of the study was to substantiate the mechanisms of interaction of the stock exchange infrastructure of Poland's stock market with investment processes in the context of institutional and structural transformation of the economy. The methodological basis of the study was economic and statistical analysis, comparative method, analysis of dynamic series, historical and logical method and the method of generalisation of thematic scientific research. It was established that the development of Poland's stock market was accompanied by a transition from institutional formation to functional maturity, which is manifested in a change in the sources of liquidity formation, investor structure and the nature of interaction with macroeconomic processes. At an early stage, market capitalisation increased from less than 1% of gross domestic product to about 20%, which reflected the creation of basic conditions for the market to function and its role in privatisation processes. After integration into the European Union, capitalisation more than doubled and exceeded PLN 600 billion, which was accompanied by an expansion of the investor base, an increase in trading volumes and increased liquidity. During the period of structural stabilisation, market capitalisation is set to increase to over PLN 1 trillion in 2021, and during the period of recovery growth – to PLN 2.3 trillion in 2026, reflecting a significant expansion of the market scale. Share trading volumes reached about PLN 470 billion per year, and the number of investment accounts exceeded 2.5 million, which indicates an increase in domestic demand. It was found that the market structure is determined by a high share of foreign investors, which exceeds 50% of trading volumes, as well as the concentration of liquidity within a limited group of the largest companies. It was proven that the dynamics of the stock market demonstrate high sensitivity to global financial impulses, which is manifested in synchronous fluctuations of indices and changes in trading activity. It is substantiated that the effectiveness of the stock exchange infrastructure as a mechanism for attracting investments is determined by a combination of the parameters of the primary market, the role of institutional investors, the level of liquidity and the degree of integration into the global financial environment. The practical significance of the study lies in the possibility of using the established dependencies and structural characteristics of the stock market to substantiate decisions on the development of the institutional environment, diversification of the investor base and increasing the market's resilience to external financial impulses

Keywords: gross domestic product; capitalisation; liquidity; issuers; volatility

Suggested Citation:
Lyashenko, S., & Baranovskyi, O. (2026). The role of the stock exchange infrastructure in attracting investments into the country's economy using the example of the Republic of Poland (1989-2026). *Economic Forum*, 16(2), 8-22. doi: 10.62763/ef/2.2026.08.

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Introduction

The stock market infrastructure is one of the basic elements of the financial system, through which capital mobilisation, redistribution of financial resources between sectors of the economy and the formation of investment signals for market participants are ensured. For Poland, this is of a decisive nature, since the development of the country's stock market took place as part of a broader institutional transformation associated with the transition to a market economy, integration into the European financial space and the gradual complication of the mechanisms of capital functioning. In such conditions, the stock market infrastructure ceases to be only a technical environment for securities circulation and takes on the role of an institutional mechanism that determines the access of enterprises to investment resources, the level of market liquidity and the degree of its sensitivity to internal and external shocks. The development of the stock exchange may be accompanied by an increase in capitalisation, an increase in initial public offerings and an expansion of the investment base, however, this effect depends on the quality of the regulatory environment, market structure, the participation of institutional investors and the nature of external financial influences. In such circumstances, the analysis of the Polish market makes it possible to gain a deeper understanding of how the stock exchange infrastructure shapes investment attraction channels, provides liquidity and integrates the national capital market into the international financial environment.

L. Zieba (2025) studied the relationship between the development of the stock exchange and economic growth in Poland. The author showed that not only the scale of the market is important, but also its ability to provide liquidity, maintain capitalisation and create conditions for the effective redistribution of financial resources. The conclusions obtained make it possible to consider Poland's stock market not only as an indicator of economic dynamics, but also as one of the mechanisms through which financial development affects investment activity and economic growth parameters. At the same time, in the study by R.P. Pradhan *et al*. (2020), the relationship between the development of the bond market, stock market and economic growth is examined using the material of the "Group of Twenty" countries. The authors proved that the development of capital markets forms a multi-level effect on macroeconomic dynamics, since financial markets perform not only the function of accumulating resources, but also the function of transmitting expectations, assessing risk and redistributing capital.

The issue of the primary market and access to capital for enterprises is revealed in the work of D. Podedworna-Tarnowska (2023), devoted to the costs of Initial Public Offering (IPO) in Poland. The author showed that the company's entry into the stock exchange is accompanied by transaction costs, which can affect the attractiveness of stock exchange financing for issuers. In this context, the stock exchange infrastructure appears not only as a channel for attracting capital, but also as a system of conditions within which the issue of stock market accessibility for different groups of enterprises is resolved.

A related aspect is investigated in the work of K. Gemra & P. Kwestarz (2024), which analysed investor demand for shares during IPOs in Poland and subsequent price dynamics after the stock market debut. The authors concluded that the demand parameters at the IPO stage are important for the subsequent market behaviour of shares, which indicates the importance of investor reaction as an element of the functioning of the stock exchange infrastructure. This makes it possible to consider the primary market not only as a tool for raising funds, but also as an environment in which the initial assessment of the investment attractiveness of a company is formed. In contrast, the study by C.B. Martysz (2022) focused on the free float indicator on the Polish capital market and its significance for investors. The author proved that the structure of free float of shares is directly related to market liquidity, pricing quality and investment attractiveness of companies.

The role of institutional investors in the functioning of Poland's stock market is revealed in the work of M. Kałdoński & T. Jewartowski (2024). The researchers analysed the impact of pension reform on the managerial behaviour of portfolio companies. The authors showed that the transformation of pension fund positions affects not only corporate governance, but also general market monitoring mechanisms. This approach is important for understanding that the stock exchange infrastructure encompasses not only trading and regulatory mechanisms, but also the institutional structure of demand for financial instruments, which determines the stability and depth of the market.

The work of H. Gurgul & R. Syrek (2025) was investigating the relationship between algorithmic trading, liquidity and volatility on Polish market. Authors concluded that the development of technological trading mechanisms changes the nature of market dynamics, the importance of microstructural parameters of the exchange is increased. This is a sign of the Polish market moving to a more complex model of operation, in which the characteristics of the infrastructure determine not only the ability to carry out transactions, but also the level of liquidity, the speed of reaction to information and the scale of short-term fluctuations.

A separate direction of analysis is presented in the work of E. Fraszka-Sobczyk & A. Zakrzewska (2025), devoted to the influence of foreign stock indices on the volatility of the Warsaw Stock Exchange Index (WIG20). The authors showed that Poland's stock market is closely connected with the external financial environment, and the behaviour of the main index largely depends on international market impulses. This makes it

possible to consider the Polish stock exchange infrastructure as an open system in which national mechanisms for attracting investments are combined with external dependence on global capital flows and international market conditions.

The case studies highlight certain aspects of the functioning of Poland's stock market, in particular the relationship between the development of the stock exchange and economic growth, the role of IPOs in attracting capital, the importance of institutional investors, as well as the dependence of the Polish market on algorithmic trading and external financial indices. At the same time, these works mainly consider individual segments or market mechanisms. The issues of the holistic evolution of the Polish stock exchange infrastructure, its transition from institutional formation to functional maturity, as well as its role as a mechanism for attracting investments in connection with changes in liquidity, investor structure, market capitalisation and macroeconomic dynamics remain insufficiently generalised.

The aim of the study was to identify the features of the functioning of the Polish stock exchange infrastructure in the process of attracting investments in the context of its institutional and structural evolution. To achieve this goal, the following tasks were defined: to trace the main stages of the development of Poland's stock market and the transformation of its stock exchange infrastructure; analyse changes in the structure of issuers, investors, liquidity, and market capitalisation; assess how the development of stock exchange infrastructure is related to the dynamics of investment activity and macroeconomic parameters of the Polish economy.

Materials and Methods

The study analysed Poland's stock market. The time frame was chosen from 1989 to February 2026, which provided the opportunity to trace the evolution of the stock market from the stage of institutional formation to the stage of functional stabilisation and integration into international financial markets. For analytical purposes, the study period was structured into several stages: the initial stage of development (1989-2004), the period after accession to the European Union (2004-2013), the stage of structural stabilisation (2013-2022) and the period of recovery growth with increased volatility (from 2023 to February 2026).

The use of different time intervals within the study was due to the distinction between levels of analysis and the functional purpose. The division into the initial stage of development, the period after accession to the European Union, the stage of structural stabilisation and the period of recovery growth with increased volatility was used to study the evolution of the stock exchange infrastructure as an institutional system, where the stages of transformation associated with changes in the economic model, accession to the European Union and further integration into international financial markets were of key importance. In contrast, the analysis of macroeconomic indicators was limited to the period 2004-2022, which corresponded to the phase of the Polish economy functioning in a single institutional and regulatory environment after integration into the European Union. It was during this period that the comparability of macroeconomic indicators, the stability of the calculation methodology and the consistency of statistical standards were ensured, which was critically important for a correct comparison with the parameters of the stock market.

The methodological basis of the study was a systemic approach, which made it possible to consider the stock exchange infrastructure as a component of the financial system, which functioned in interaction with the macroeconomic environment and international capital flows. Based on the generalisation of data by M.T. Bohl & J. Brzeszczyński (2006), R.P. Pradhan *et al*. (2020), H.M. Nguyen *et al*. (2022), the functional parameters of the stock market (liquidity, market capitalisation, investment structure and volatility) were identified, which were used as analytical variables to assess its role in the process of attracting investments.

Economic and statistical analysis was used to assess the dynamics, growth rates and correlation between stock market indicators (market capitalisation, trading volumes, number of issuers, stock indices) and macroeconomic indicators (gross domestic product (GDP) and gross fixed capital formation (GFCF)) in order to identify the relationship (World Bank, n.d.; Organisation for Economic Co-operation and Development, n.d.; European Union, n.d.). Elements of descriptive statistics were used for the analysis. This made it possible to determine the scale of stock market development, the level of its liquidity and the degree of integration into the financial system.

The comparison method was used to compare stock market parameters at different stages of its development, as well as to correlate the dynamics of financial indicators with macroeconomic indicators. Data on the structure of investors, the share of foreign capital in trading volumes, the number of investment accounts and liquidity indicators were formed on the basis of GPW Benchmark (n.d.), WOOD & Company Financial Services, A.S. (2024) and Record-breaking year 2025 on the Warsaw Stock Exchange (2026), which allowed comparison not only of the quantitative parameters of the market, but also of changes in its internal structure and sources through which investment activity was formed. A change in the functional role of the stock exchange infrastructure from a privatisation tool to a mechanism for attracting investments and integration into global financial processes was revealed. Correlation analysis was used to quantitatively assess the relationship between stock market parameters and investment activity. Market capitalisation (in % of GDP), trading volumes (in % of GDP) and stock index dynamics were selected as stock market variables, and GFCF (in % of GDP) was selected as an indicator of investment activity. The strength and direction

of the relationship were assessed using the Pearson correlation coefficient. Calculations were performed using MS Excel, the results were presented in tabular form.

Time series analysis was used to study the temporal changes in key stock market indicators and the macroeconomic environment. The construction and interpretation of time series made it possible to identify the cyclical nature of development, phases of growth, recession and recovery, as well as to assess the market response to external shocks, in particular the global financial crisis and the COVID-19 pandemic (European Bank for Reconstruction and Development, 2015; Škare *et al*., 2019; International Monetary Fund, 2026). The data from the studies by A. Boubakari & D. Jin (2010), A. Oredegbe &. O. Abioye (2022), S.H. Shala *et al*. (2025) were analysed because these data reflected key empirical approaches to assessing the impact of the stock market on investment processes, in particular taking into account the role of financial integration, volatility and structural characteristics of the market. The use provided the opportunity to interpret the obtained results in the context of the modern scientific discussion about the conditions under which the stock market functioned as a mechanism for attracting investments.

Results

The formation of the stock market infrastructure in Poland began in the context of the systemic transformation of the economy after 1989, which became the starting point for the transition from a centralised business model to market mechanisms. It was during this period that the institutional prerequisites for the functioning of the financial market were laid, in particular, privatisation mechanisms were introduced, the formation of the corporate sector was initiated, and the basic legal conditions for the circulation of property rights were created. The transition to a market economy was accompanied by the creation of institutions that ensured public pricing and the functioning of financial instruments (Balcerowicz, 1995; World Bank, 2002). In these conditions, the stock market was formed simultaneously with the corporate sector and performed the function of organising primary and secondary circulation of financial instruments. The opening of the Warsaw Stock Exchange in April 1991 became the practical implementation of the institutional changes laid down in 1989 and determined the initial parameters of the market. During the first trading session, 112 deals were concluded, and the total volume of transactions was about PLN 2 million (Claessens *et al*., 2000). The level of liquidity remained low. Market participants were represented by a limited number of investors. These characteristics reflected the early stage of infrastructure development and the limited financial resources available for investment.

The stock exchange infrastructure of Poland's stock market was formed as a multi-level system, including trading, clearing, depository and information elements. The central place in this system is occupied by the Warsaw Stock Exchange (GPW), which ensures the organisation of exchange trading and performs the function of a key platform for capital mobilisation (World Bank, 2002; Record-breaking year..., 2026). In the process of development, the stock exchange infrastructure of Poland underwent functional differentiation. In addition to the main stock market, specialised segments were formed, focused on different groups of issuers and financial instruments. In particular, the alternative market New Connect, launched in 2007, provided access to capital for small and medium-sized enterprises that do not meet the requirements of the main market (WOOD & Company Financial Services, A.S., 2024; Record-breaking year..., 2026). Its creation made it possible to expand the investment base and increase the inclusiveness of the stock market. At the same time, the Catalyst market, which specialises in the circulation of corporate and municipal bonds, developed, which contributed to the diversification of financing sources and the reduction of enterprises' dependence on bank lending (European Bank for Reconstruction and Development, 2015). A critical element of the infrastructure is the depository and settlement system, represented by the Krajowy Depozyt Papierów Wartościowych (KDPW), which ensures the accounting of ownership rights to securities and the execution of settlements for exchange transactions (Pistor *et al*., 2000; World Bank, 2002). The clearing and risk management functions are performed by the KDPW_CCP company, which increases the reliability and stability of the market (European Bank for Reconstruction and Development, 2015).

The information component of the stock exchange infrastructure is represented by a system of indices formed by the GPW Benchmark (n.d.). Stock indices serve as aggregated indicators of market dynamics and serve as a guide for investment decisions (Škare *et al*., 2019). Thus, the Polish stock exchange infrastructure evolved from a single-tier model of trading organisation to a comprehensive system covering the full cycle of financial instruments circulation – from the admission of issuers to the market to clearing, settlements and information provision. This created institutional prerequisites for increasing the efficiency of investment attraction and the integration of the national stock market into the international financial space (Bohl & Brzeszczyński, 2006; European Bank for Reconstruction and Development, 2015).

The institutional structure of the market was formed with the participation of the state. A regulatory framework was created that regulated the admission of enterprises to trading, the activities of intermediaries and the procedure for information disclosure. Regulatory mechanisms performed the function of reducing information uncertainty and ensuring minimum standards of transparency (Pistor *et al*., 2000). This created the prerequisites for the gradual expansion of the market and the attraction of new participants.

At the same time, the market structure remained limited. Privatised enterprises dominated. The share of institutional investors was insignificant. Trading volumes grew more slowly than the number of issuers. This indicated that the quantitative expansion of the market was not accompanied by a proportional increase in liquidity. The market performed the function of organising the circulation of assets, but did not yet ensure significant attraction of investment resources. The prerequisites for this state of affairs were formed back in 1989-1990, when the institutional formation of the capital market took place and the basic mechanisms for the functioning of the financial system in the conditions of transition to a market economy were laid. The dynamics of the market capitalisation of Poland's stock market for the period from 1991 to 2004 are shown in Figure 1.

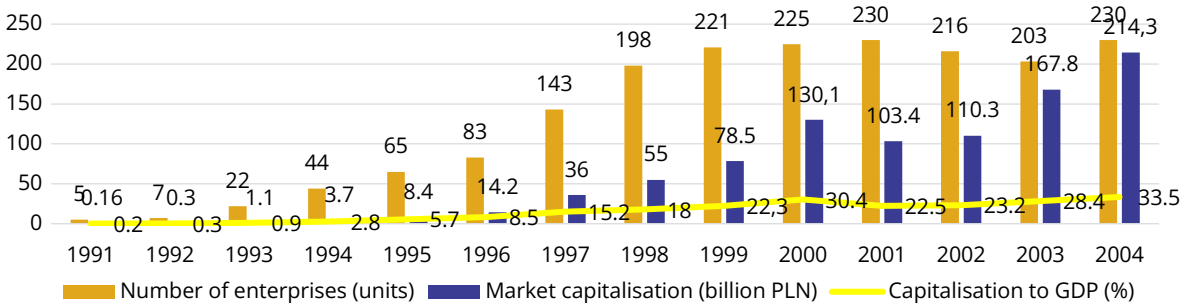

Figure 1. *Dynamics of the number of companies admitted to trading and market capitalisation of Poland's stock market in 1991-2004*

Note: *the left scale reflects the number of companies (units), the right scale – the level of capitalisation to GDP (%)*

Source: *compiled by the authors based on L. Balcerowicz (1995), World Bank (2002), K. Pistor et al. (2000), M.T. Bohl & J. Brzeszczyński (2006)*

The data presented in Figure 1 shows that during the 1990s, the number of companies admitted to trading on the stock exchange grew along with the development of privatisation programs. In 1995, 65 companies were represented on the stock exchange, and in 2000 the number increased to 225. Market capitalisation also showed growth. According to the World Bank (2002), it increased from less than 1% of GDP in the early 1990s to approximately 20% of GDP in the early 2000s. This indicated a gradual expansion of the role of the stock market in the financial system.

In the period 1991-2004, the Polish stock exchange infrastructure acquired the basic characteristics of an organised capital market. It ensured the circulation of financial instruments, formed the rules of interaction between participants and created the prerequisites for further growth. However, its ability to accumulate investment resources remained limited and depended on further institutional development and expansion of the investment base.

After 2004, the development of Poland's stock market took place in a different institutional environment. Accession to the European Union meant a transition to a regulatory model based on unified rules for the functioning of financial markets. The national regulatory system was brought into line with European legislation, in particular Directive No. 2004/39/EC of the European Parliament and of the Council (2004). This changed the conditions for admission to trading, disclosure requirements and the structure of interaction between market participants. The market became more standardised. Institutional risks decreased.

These changes were accompanied by a transformation of the structure of investors. The share of institutional participants increased. Pension and investment funds began to play a decisive role in shaping the demand for financial instruments. The presence of foreign capital increased, which changed the parameters of liquidity. Trading volumes grew faster than the number of issuers. The market ceased to be primarily a privatisation tool. It began to perform the function of attracting capital (Bohl & Brzeszczyński, 2006). Quantitative developmental parameters confirm this change (Fig. 2). The data presented in Figure 2 shows that in 2004-2013, the market capitalisation of Poland's stock market increased from PLN 214.3 billion in 2004 to PLN 638 billion in 2013. The peak of growth occurred in 2007 (PLN 509.9 billion), after which in 2008 there was a sharp decrease to PLN 267.4 billion. Later, a gradual recovery of the indicator was observed, which already in 2010 exceeded PLN 540 billion. The volume of stock trading showed similar dynamics: an increase to PLN 568.1 billion in 2007, a decline in 2008 to PLN 396 billion and a further recovery to a level of over PLN 500 billion. These fluctuations reflected the integration of the Polish market into the international financial environment. The reaction to external shocks became more pronounced. Meanwhile, the market's instrumental base expanded. The role of stock indices as indicators of market dynamics grew. The WIG20 index became a benchmark for assessing the state of the largest companies and general market trends. Its behaviour began to correlate with global financial cycles. This indicated an increase in the degree of integration of the Polish capital market into the international system.

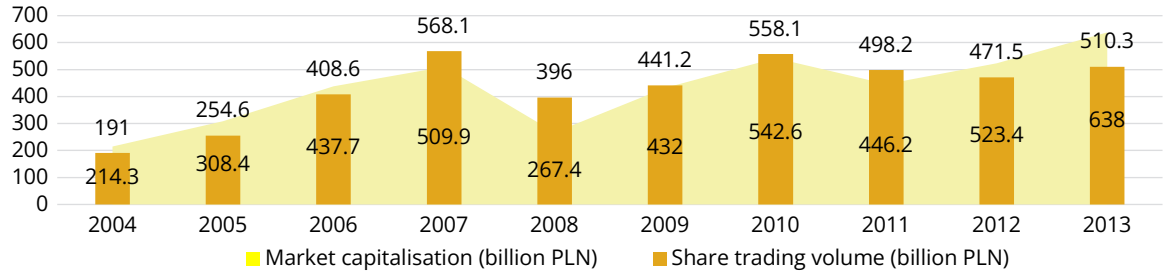

Figure 2. *Dynamics of market capitalisation and trading volumes of Poland's stock market in 2004-2013*
Note: *the left scale reflects the values of market capitalisation and trading volumes of shares, expressed in billion PLN*
Source: *compiled by the authors based on M.T. Bohl & J. Brzeszczyński (2006), European Bank for Reconstruction and Development (2015), M. Škare et al. (2019), WOOD & Company Financial Services, A.S. (2024)*

At the same time, the market structure remained heterogeneous. A significant part of new share placements were associated with state-owned companies. This meant that the state continued to play the role of a key issuer even after the completion of the main stage of privatisation. However, the nature of this participation changed. If in the 1990s it was aimed at creating a market, then in the 2000s it was used as a tool for raising capital through public offerings. In the period 2004-2013, Poland's stock market moved from the stage of institutional formation to the stage of functional consolidation. It integrated into the European financial space, expanded the investment base and increased the level of liquidity. This created the conditions for using the stock exchange infrastructure as a mechanism for attracting investment resources. After 2013, the development of Poland's stock market took place in conditions of stabilisation of the institutional environment and increased its sensitivity to external financial impulses. The key parameters of the market were no longer determined by internal processes of infrastructure formation. These parameters reflected the interaction with international capital flows and the pan-European dynamics of financial markets (European Bank for Reconstruction and Development, 2015). The market moved to a stage where changes were manifested not so much in quantitative expansion as in changes in the structure and nature of functioning (Fig. 3).

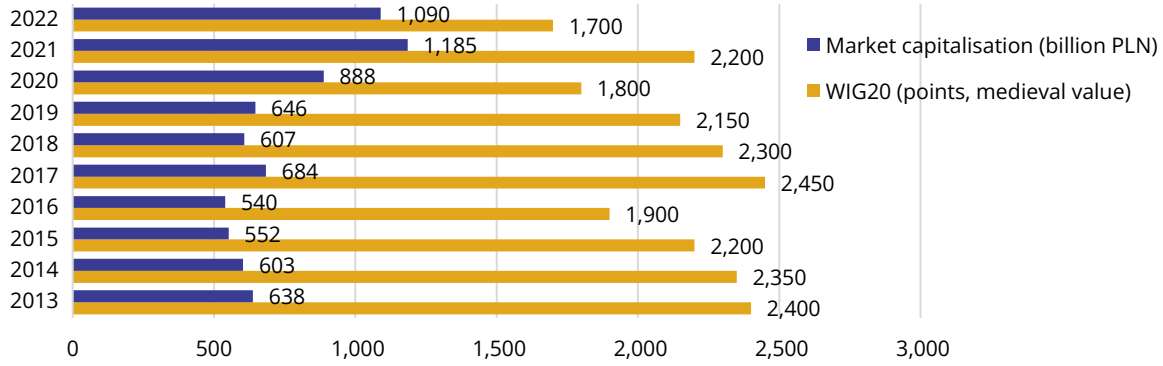

Figure 3. *Dynamics of market capitalisation and stock indices of Poland's stock market in 2013-2022*
Source: *compiled by the authors based on M. Škare et al. (2019), WOOD & Company Financial Services, A.S. (2024), GPW Benchmark (n.d.), Investing.com (n.d.)*

Based on the data presented in Figure 3, the market capitalisation of Poland's stock market in 2013-2022 was characterised by pronounced variability. In 2013, its volume was PLN 638 billion, after which a decrease was observed to PLN 540 billion in 2016. Later, a gradual recovery took place: in 2017, the indicator increased to PLN 684 billion, in 2019 it was PLN 646 billion, and in 2021 it reached PLN 1,185 billion. In 2022, the market capitalisation decreased slightly to PLN 1.090 billion. The dynamics of the WIG20 stock index demonstrate a similar sensitivity to changes in the market environment: from 2,400 points in 2013, the indicator decreased to 1,900 points in 2016, after which it increased to 2,450 points in 2017, and in 2021 it was 2,200 points with a further decrease to 1,700 points in 2022. Such dynamics reflect the dependence of the stock market on external financial conditions and changes in market valuations of assets. Such changes reflect the dependence of the market on global financial conditions and the dynamics of asset valuations.

The structure of investors underwent noticeable changes. The share of foreign participants in the total trading volume remained high, and in some periods exceeded 50%. This means that the formation of liquidity depended to a large extent on external capital. This configuration combined external sensitivity and internal liquidity support. The importance of stock indices as aggregate indicators of market dynamics increased. The WIG20 index reflected not only the state of large companies, but also the market's reaction to global shocks. The decline in 2020 was associated with the pandemic, and the subsequent recovery was accompanied by a rapid growth of indices. This indicated the integration of the Polish market into a broader financial context, in which dynamics are determined not only by national factors. In parallel, a segmented market structure developed. An alternative platform for small and medium-sized enterprises provided access to capital for companies that did not meet the requirements of the main market. This expanded the functional capabilities of the stock exchange infrastructure. It began to cover different types of issuers and different levels of risk. Such diversification increased the market's adaptability to changes in the economic environment.

After 2013, Poland's stock market acquired the characteristics of a functionally mature system. Its development is determined not by the expansion of the number of participants, but by changes in the structure of investors, the level of liquidity and interaction with international financial flows. The structural configuration of Poland's stock market underwent gradual changes during the transition from the formation stage to the stage of functional stabilisation. If in the early stages, enterprises undergoing privatisation dominated, then in the future the issuer structure became more differentiated. The main market retained the presence of large companies with state participation. At the same time, the share of private business grew. This indicated a change in the sources of supply of financial instruments and a gradual decrease in the role of the state as the primary supplier of assets.

Changes in the structure of investors were no less significant. In the 1990s, the market was characterised by limited participation of institutional participants. Later, the role increased. Pension funds, investment funds and insurance companies became key carriers of demand for financial instruments. According to the Warsaw Stock Exchange, in 2010 the share of institutional investors in the trading structure consistently exceeded the share of individual participants (WOOD & Company Financial Services, A.S., 2024). This meant a change in the behavioural model of the market. Investment decisions were increasingly determined not by short-term expectations, but by portfolio strategies. At the same time, the role of foreign capital remained significant. In different periods, its share in trading volumes fluctuated within 40-60%. This level of participation formed a double effect. On the one hand, it provided liquidity and access to external financial resources. On the other hand, it increased the market's sensitivity to external shocks and global changes in investor sentiment. This was reflected in the synchronous fluctuations of Poland's stock market indicators along with the dynamics of international financial markets (European Bank for Reconstruction and Development, 2015).

The changes also affected the level of liquidity. Over the entire period of market development, trading volumes grew faster than the number of issuers. This indicated a concentration of transactions within a limited group of the most liquid companies. Such a structure is typical for markets that reached the stage of functional maturity. It means that the stock exchange infrastructure is able to provide significant volumes of transactions without a proportional expansion of the list of participants. In parallel, market segmentation took place. Along with the main platform, alternative platforms for small and medium-sized enterprises operated. This expanded access to capital for companies with different levels of development and risk. This multi-level structure increased the flexibility of the market and allowed for the adaptation of financing instruments to the needs of different groups of issuers. As a result of the changes, Poland's stock market acquired the features of a structurally differentiated system. Its functioning is determined by the interaction of several groups of participants, different segments of instruments and a combination of internal and external sources of liquidity. This means that the stock exchange infrastructure performs not only the function of organising the circulation of assets, but also ensures the distribution of financial resources between different sectors of the economy depending on the investment attractiveness.

After 2022, the dynamics of Poland's stock market is characterised by a transition from a correction phase to a recovery growth with an increased level of volatility. Already in 2023, the WIG20 index showed an increase of approximately 30%, which reflected the return of investment activity after a period of declines (GPW Benchmark, n.d.). In 2024, there was some decline, which indicated the instability of the recovery and dependence on external macro-financial conditions. The most significant year was 2025, which saw an acceleration in market dynamics. The broad market index WIG rose by 47%, the highest increase in the entire period (GPW Benchmark, n.d.). The volume of stock trading reached around PLN 470 billion. The volume of capital raised exceeded PLN 20 billion. At the same time, the number of investment accounts increased to over 2.5 million, reflecting the expansion of the domestic investment base (Reuters, 2025). The dynamics of the beginning of 2026 confirm the continuation of this trend. The trading volume in January-February exceeded PLN 100 billion, and the average daily turnover reached about PLN 2.5 billion (Record-breaking year..., 2026). This indicates a high level of liquidity and intensity of operations, even in an

unstable global environment. The total market capitalisation exceeds PLN 2.3 trillion, which confirms a significant expansion of the market. At the same time, growth means greater vulnerability to external shocks. In 2025, indices experienced sharp short-term fluctuations that even led to the temporary suspension of trading because of the risks of instability (Reuters, 2025). This is a change in the way the market is working. It responds not only to domestic economic conditions but also to global financial signals.

The activation of the primary market requires special attention. In 2024-2025, companies will continue to show interest in public offerings of shares as a tool for raising capital, particularly in the technology and medical sectors. This indicates the restoration of the stock market's function as a channel for financing corporate development. In 2023-2026, the development of Poland's stock market is characterised by a simultaneous expansion of key financial parameters and increased sensitivity to external influences. An increase in liquidity, capitalisation, and investor activity is accompanied by increased volatility, reflecting the market's dependence on global financial fluctuations. Such dynamics indicate that the stock exchange infrastructure reached the stage of functional maturity, within which its stability is formed under the influence of both internal and external factors.

The evolution of the stock exchange infrastructure of Poland's stock market demonstrates a consistent transition from institutional construction to functional stabilisation. In the initial period, the market was formed as a tool for organising privatisation processes and creating basic mechanisms for the circulation of property rights. Its parameters were determined by a limited number of issuers, low liquidity and a significant role of the state in the formation of the institutional environment. The stock exchange infrastructure performed primarily a coordination function. It provided minimal conditions for the functioning of the market. Subsequently, a change in functional characteristics occurred. Integration into the EU led to the harmonisation of the regulatory environment and the expansion of the investment base. The role of institutional participants increased; trading volumes increased. The market began to perform the function of attracting capital. Its dynamics became dependent on external financial processes, which reflected integration into the international capital market.

At the stage of structural stabilisation, changes were manifested in the transformation of the internal configuration of the market. Quantitative growth gave way to changes in the structure of issuers and investors. The role of foreign capital increased. The concentration of liquidity within the largest companies increased. Market segmentation appeared, which made it possible to cover different groups of issuers. This means a transition to a model in which the stock exchange infrastructure ensures not only the circulation of assets, but also the distribution of financial resources between sectors of the economy. The combination of these changes indicates the formation of a functionally full-fledged stock market. Its infrastructure is able to ensure the mobilisation of capital, maintain liquidity and integrate the national economy into international financial flows. At the same time, the growing role of external investors and increased sensitivity to global shocks create additional risks of instability. This determines the need for further analysis of the relationship between the development of the stock exchange infrastructure and the dynamics of investment processes. The institutional and structural transformation of Poland's stock market created the prerequisites for using the stock exchange infrastructure as a mechanism for attracting investment. The assessment of this mechanism requires a transition from a description of the internal evolution of the market to an analysis of its interaction with macroeconomic indicators. At the same time, the macroeconomic dynamics of Poland during 2004-2022 is characterised by relative stability with clearly pronounced phases of cyclical fluctuations (Fig. 4). After joining the EU, the economy demonstrated steady growth.

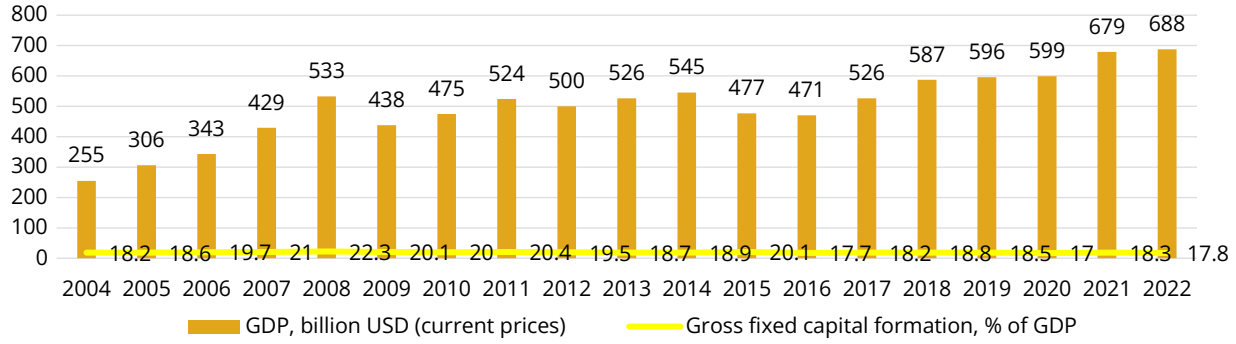

Figure 4. *Dynamics of GDP and GFCF in Poland in 2004-2022*
Note: *GDP is given in billions of US dollars (left scale), GFCF is shown as a percentage of GDP (right scale)*
Source: *compiled by the authors based on World Bank (n.d.), Organisation for Economic Co-operation and Development (n.d.), M. Škare et al. (2019), International Monetary Fund (2026)*

The data presented in Figure 4 shows that in the period 2004-2008, the average annual GDP growth rate exceeded 5%. This was accompanied by an increase in investment activity and an increase in the inflow of foreign capital. The global financial crisis of 2008-2009 did not lead to a deep recession. Poland remained one of the few economies in Europe that avoided recession. Growth rates slowed down, but remained positive. This reflected the internal resilience of the economy and the relatively low level of financial vulnerability. In 2010-2019, economic dynamics stabilised. During this period, GDP grew within 3-5% per year. Investment activity also showed growth, although its pace was less uniform.

At the same time, the period 2020-2022 is marked by a sharp change in macroeconomic parameters. GDP contracted by around 2% in 2020 due to the pandemic restrictions. Already in 2021, the economy recovered, with growth rates above 6 percent. In 2022 there was a slowdown to the level of 4-5% or so. Inflation meanwhile soared above 10%. This influenced the investment behaviour and the cost of capital (European Union, n.d.). Investment indicators show a more complex dynamic. GFCF rose until 2008. Then the indicators have declined. Investments recovered from 2009, but were sensitive to economic fluctuations. Foreign direct investment was volatile as well. The inflow was driven by global financial conditions and domestic economic policies (World Bank, n.d.).

To check the presence of a statistical relationship between the development of the stock market and investment activity, a correlation analysis was conducted based on data for the period 2004-2022. Market capitalisation and trading volumes normalised to GDP, as well as the dynamics of the stock index, were used as indicators of stock market development. GFCF (in % of GDP) was chosen as an indicator of investment activity. The results of the calculations are presented in Table 1.

Table 1. *Correlation matrix of stock market indicators and investment activity (2004-2022)*

Indicator	Capitalisation/GDP	Trading volume/GDP	WIG20	GFCF/GDP
Capitalisation/GDP	1	0.75	0.68	0.72
Trading volume/GDP	0.75	1	0.70	0.58
WIG20	0.68	0.70	1	0.49
GFCF /GDP	0.72	0.58	0.49	1

Source: *compiled by the authors*

The results of the calculations indicate that there is a positive statistical relationship between the parameters of the stock market and investment activity. The most pronounced correlation is observed between market capitalisation and GFCF, which indicates that the growth of the value of the stock market is accompanied by an increase in investment activity in the economy. Trading volumes also demonstrate a positive, but less stable relationship with investments, which may be due to the greater sensitivity to short-term market fluctuations.

The dynamics of stock indices reveal a moderate relationship with investment activity, which confirms the role as indicators of expectations, rather than a direct channel for attracting investments. During periods of stock market growth, investment activity increases, while during periods of decline this indicator decreases, which is consistent with the results of a previous qualitative analysis . At the same time, the results obtained indicate the nonlinear nature of the relationship. Although the overall trend is positive, the strength of the relationship varies depending on the phases of the economic cycle and the impact of external shocks. This confirms that the stock market performs not only the function of accumulating investment resources, but also the role of an indicator of changes in investment expectations. If investments are more volatile than GDP, then factors affecting investment activity can play a decisive role in shaping economic dynamics. In this context, the development of the stock market acquires particular importance. It can act as a channel through which financial resources are transformed into investments, or as an indicator of changes in investment expectations (Pradhan *et al*., 2020). This indicates that the macroeconomic dynamics of Poland in the period under study is characterised by relative stability with periodic shocks, while investment activity demonstrates higher volatility.

The dynamics of unemployment and inflation in Poland reflect the change in the macroeconomic conditions in which investment activity is formed. In the period after 2004, the unemployment rate showed a steady downward trend. If in 2004 it exceeded 19%, then by 2008 it had decreased to about 7%. This was accompanied by an increase in economic activity and an expansion of labour demand (World Bank, n.d.). During the global financial crisis, there was a temporary increase in unemployment. In 2010-2013, its level fluctuated within 9-10%. Later, the downward trend resumed. By 2019, the indicator had decreased to about 3-4%. This meant achieving a state of high employment, which created favourable conditions for the expansion of domestic demand and investment (Organisation for Economic Co-operation and Development, n.d.). Inflation dynamics were less stable. In 2004-2019, inflation remained relatively moderate and mostly did not exceed 3%. In some years, even deflation was recorded. The situation changed after 2020. In 2021-2022, inflation increased to double-digit values. This was due to global shocks, rising energy prices and disruptions in supply chains (European Union, n.d.).

Changes in these indicators have direct implications for investment processes. A decrease in unemployment reflects an expansion of economic activity and creates conditions for growth in income and demand. High inflation, on the contrary, increases uncertainty and affects the cost of capital. It also changes the structure of investment decisions. In such conditions, financial markets react faster than the real sector, which makes these markets an important indicator of changes in the economic environment (Pradhan *et al*., 2020). The overall dynamics of the indicators are of an asymmetric nature. Unemployment is slow to change and has a long-term downtrend. Inflation is marked by sharp fluctuations. (World Bank, n.d.). This is particularly true in 2021-2022, when inflation is rising sharply at a low unemployment rate. This setup suggests a change in macroeconomic equilibrium. The labour market is stable and price dynamics is the main source of uncertainty. The combination of low unemployment and high inflation forms a contradictory investment environment. On the one hand, there are prerequisites for increased economic activity. On the other hand, the risk of instability increases and the cost of financial resources changes. This creates conditions under which the role of the stock market as a mechanism for capital redistribution and an indicator of expectations is strengthened.

A comparison of the parameters of the stock market and macroeconomic indicators of Poland makes it possible to identify a stable relationship between the dynamics of the financial sector and investment activity. The growth of market capitalisation and trading activity in 2004-2007 was accompanied by an increase in the rate of economic growth and the expansion of investments. During this period, the stock market performed the function of accumulating financial resources, which were transformed into investments of the real sector. Periods of recession demonstrate a different configuration. In 2008-2009, the reduction in capitalisation and trading volumes was accompanied by a decrease in investment activity. Similar dynamics were observed in 2020. This indicates that the stock market responds to changes in the economic environment faster than the real sector. It functions as an indicator of expectations and a channel for transmitting financial shocks (Pradhan *et al*., 2020). At the same time, the relationship between the stock market and macroeconomic indicators is not linear. Investments demonstrate greater volatility compared to GDP. Inflationary fluctuations also affect investment decisions, changing the cost of capital. This means that the stock market not only reflects economic dynamics, but also influences it through changes in financing conditions and investment expectations.

The combination of these factors makes it possible to consider the stock market not only as an indicator of economic processes, but also as one of the mechanisms for investment support of the economy. In the case of Poland, this mechanism acquired a completed form after integration into the EU and stabilisation of the institutional environment. Further development is determined by the interaction of internal economic factors and global financial conditions. The analysis demonstrates the existence of a relationship between the development of the stock exchange infrastructure and investment dynamics. The stock market acts as a channel for transforming financial resources into investments, as well as a mechanism for forming expectations regarding economic development. In the case of Poland, the stock exchange infrastructure formed as a full-fledged channel for the redistribution of financial resources, however, its impact on investment processes is heterogeneous. On the one hand, the development of the stock market was accompanied by an increase in capitalisation, liquidity, and investor participation. On the other hand, the relationship between financial development and economic growth is not linear and depends on the market structure and the quality of the institutional environment (Boubakari & Jin, 2010; Nguyen *et al*., 2022).

The stock exchange infrastructure provides a set of interrelated mechanisms for attracting investment. It creates conditions for direct access of enterprises to capital through instruments of IPO of shares and additional issues, forming an alternative to bank financing and expanding the possibilities of investment activities. At the same time, the stock market performs the function of market valuation of companies: changes in capitalisation determine the investment attractiveness of enterprises and affect the cost of attracting financial resources. In parallel, the development of the stock exchange infrastructure is accompanied by increased transparency and standardisation of information, which reduces information barriers and increases the efficiency of investment decisions. This reduces information barriers for investors and contributes to the mobilisation of savings in the form of investments.

At the same time, the effectiveness of the stock exchange infrastructure as a mechanism for attracting investments is limited by a number of structural factors. One of these factors is the concentration of capital in a limited number of large companies. This means that a large part of the liquidity is concentrated in a few market segments, while access to financing for small and medium-sized enterprises remains limited. Another is the market's reliance on external capital. A high share of foreign investors brings liquidity, but at the same time it makes the market more sensitive to global financial fluctuations. In such conditions, the changes in the international financial environment are quickly transmitted to the dynamics of the national market. Special attention must be paid to the volatility of the stock market. Markets with greater degree of integration exhibit more significant response to external shocks and are characterised by persistent volatility (Oredegbe & Abioye, 2022). This has direct implications for the investment process.

In periods of instability, investors change their behaviour, which leads to a decrease in investment volumes or redistribution between sectors. Therefore, the stock market is not only a channel of attracting capital, but also a mechanism for transferring financial risks. Unequal access to stock market financing instruments also is one of the limitations for enterprises. The impact of alternative market segments on the overall investment volume is still minor, but there are more opportunities to attract capital in these market segments. This means that a large part of companies still depends on bank financing or internal resources. Thus, the stock market still plays a limited role as a universal mechanism for financing the economy.

Infrastructure of the Polish stock exchange plays an important role in attracting investment, but its effectiveness is not absolute. It ensures mobilisation of financial resources, forms market signals and integrates economy in global financial space. At the same time, its capacity is limited by the concentration of capital, dependence on external factors and unequal access to financing. This means that the stock market should be seen as one element of the investment system, not its sole driver. The stock exchange infrastructure of the Polish stock market has acquired the features of a functionally mature element of the financial system, ensuring the accumulation of capital, transmitting investment signals and supporting the inclusion of the national economy in the international financial space. However, the influence on investment dynamics comes indirectly and is determined by the internal structure of the market, parameters of the regulatory environment and the effect of external financial factors. Under such conditions it is advisable to consider the stock market not as a self-sufficient source of economic growth, but as an institutional mechanism, the effectiveness of which is determined by the level of financial integration and the characteristics of the country's economic model. Such an interpretation allows to consider the stock exchange infrastructure not only as an indicator of economic processes, but as a component of the system of development of long-term investment.

Discussion

The results of the study need to be compared with European empirical approaches to the analysis of the functioning of stock markets, which consider the stock exchange infrastructure as a complex mechanism that combines the processes of capital attraction, liquidity formation and transmission of financial impulses. In the case studies, the main attention is focused on the interaction of the primary and secondary markets, the role of investor behaviour, as well as the impact of global financial integration on volatility parameters and market efficiency. In this context, the analysis of Poland's stock market makes it possible to assess the extent to which the results obtained are consistent with international trends and whether these results reflect the specifics of the national development model or general patterns of the functioning of capital markets.

The results obtained indicate that the ability of the stock exchange infrastructure to ensure capital attraction is determined not only by the scale of the market, but also by liquidity parameters and institutional characteristics. In this context, the study by D. Mellouli & S. Ellouz (2023) found that the liquidity of shares after an IPO in emerging market countries is influenced by the institutional environment, demand structure and characteristics of the investment base. The authors proved that even in the presence of an active primary market, the efficiency of capital raising depends on the market's ability to maintain a stable circulation of securities after the placement. This makes it possible to consider liquidity as a key condition for the functioning of the stock market, and not as a derivative result of its development. The conclusions obtained are consistent with the results of the study, which found that in the case of Poland, the expansion of the number of issuers was not accompanied by a proportional increase in liquidity, and its concentration within a limited range of companies determines the real ability of the market to perform the investment function.

In the Polish economy, the growth of market capitalisation and trading volumes during periods of economic recovery is accompanied by increased investment activity. This is consistent with the results of research by A. Boubakari & D. Jin (2010), which show a positive relationship between stock market development and economic growth in emerging market countries. At the same time, H.M. Nguyen *et al*. (2022) indicated that this effect is enhanced in the presence of developed institutions and a stable macroeconomic environment. In the case of Poland, integration into the European financial space and harmonisation of the regulatory environment created the conditions for the implementation of these channels. I. Khan (2025) shows that the integration of stock markets of emerging countries into the global financial system is accompanied by increased volatility transmission effects between markets. The author found that the increase in the openness of financial systems leads to an increase in the sensitivity of national markets to external shocks, which is manifested in synchronous fluctuations of indices and changes in investor behaviour. This indicates that market integration simultaneously expands access to capital and increases the risks of instability. The dependence of Poland's stock market on external financial impulses established in the study confirms the above-mentioned patterns, since the high share of foreign investors and the synchronicity of the dynamics of indices with global markets reflect the inclusion of the stock exchange infrastructure in the international system of capital flows.

At the same time, the study by I. Demir *et al*. (2025) found that the activity of IPOs in stock markets is determined by the level of liquidity, macroeconomic stability

and the degree of development of the financial system. The authors proved that markets with higher liquidity and a deeper institutional structure demonstrate a greater ability to attract new companies and accumulate capital through IPOs. At the same time, the number of placements and the volume of resources raised directly depend on investor confidence and the quality of the market infrastructure, which creates conditions for the effective functioning of the primary market. These results correlate with the conclusions obtained, according to which in Poland the transition to the stage of functional maturity was accompanied by the activation of the primary market and the growth of the role of the stock exchange as a channel for financing corporate development, however, the effectiveness of this mechanism remains dependent on the liquidity and structure of the investment base.

In turn, the study by O.A. Adeosun *et al*. (2024) analysed the mechanisms of volatility transmission between financial markets in conditions of growing economic uncertainty and geopolitical risks. The authors found that changes in global risk and uncertainty indicators are quickly translated into the dynamics of financial assets, forming short-term fluctuations and changing investment behaviour. This indicates that stock markets function as channels for transmitting information and risks in the international financial environment. The results obtained in the study confirm this pattern, since the dynamics of Poland's stock market are characterised by increased volatility and rapid response to external financial impulses, which is manifested in sharp fluctuations in indices and changes in trading volumes in response to global economic signals. In contrast, the study by A. Albada *et al*. (2024) found that discrepancies in investor expectations during IPOs shape subsequent price dynamics and the level of market uncertainty. The authors, using machine learning approaches, convinced that information asymmetry and heterogeneity of investor assessments determine the behaviour of assets after listing on the stock exchange. This means that the efficiency of the primary market depends not only on the formal parameters of the offering, but also on the quality of the information environment and the structure of investor demand. These conclusions are consistent with the results of the study, which found that in Poland, the change in the structure of investors and the growth of the role of institutional participants are accompanied by a transformation of the behavioural characteristics of the market, which affects the liquidity and stability of price processes.

Y. Helhel (2026) studied the relationship between stock market development and economic growth in countries with vulnerable economies. The author determined that the growth of market capitalisation, liquidity, and circulation of financial instruments has a positive effect on economic dynamics, however, this effect depends on the institutional quality and level of development of the financial system. It was found that in countries with underdeveloped infrastructure, the impact of the stock market on economic growth is limited and unstable. The results confirmed the above-mentioned relationship, since in the case of Poland the relationship between stock market development and investment activity is nonlinear and is determined by a combination of internal structural characteristics of the market and external financial conditions. In this context, it is advisable to take into account that the efficiency of the stock exchange infrastructure is determined not only by the ability to accumulate capital, but also by the nature of its subsequent redistribution between different groups of issuers. The stock market may formally demonstrate high capitalisation, significant trading volumes and a stable presence of investors, but this does not mean that enterprises have equal access to financial resources. Analysis of the Polish experience has shown that the growth of liquidity and capitalisation has been associated with the concentration of market activity in the largest companies and the auxiliary role of alternative market segments. This allows to assert that the stock exchange infrastructure performs the investment function in a differentiated manner: it effectively helps to mobilise capital for the most attractive issuers, but does not completely eliminate the structural barriers for a wider range of companies. Therefore, for assessment of its influence on investment processes it is necessary to take into account not only the total size of the market, but also the internal structure of liquidity and capital distribution.

The combination of these factors determines the place of the stock market in the economic model of Poland. It functions as an institutional element that combines domestic sources of capital with international financial flows. Its development contributes to increasing financial openness and strengthening trust in the corporate sector. At the same time, its impact on investment dynamics is mediated by the structural characteristics of the market and global financial conditions. In contrast, S.H. Shala *et al.* (2025) pointed out the complex and multi-level nature of the relationship between financial development and economic growth. The generalisation of the above approaches makes it possible to consider the stock exchange infrastructure as a multi-level mechanism in which liquidity parameters, investor behaviour and external financial factors interact. In this context, the results of European researchers indicate that the efficiency of the primary market is determined not only by the ability to place securities, but also by the ability to maintain the circulation, form stable demand and ensure adequate asset valuation. At the same time, the studies under consideration emphasise that integration into the global financial environment increases the interdependence of markets and causes the transmission of volatility, which changes the nature of the functioning of national exchange systems.

The results obtained in the study make it possible to clarify these provisions using the example of Poland, where the development of the stock exchange infrastructure is accompanied by a simultaneous increase in its investment capacity and increased sensitivity to external financial impulses. This indicates that the new generation stock market functions as an open system in which capital mobilisation is combined with risk transmission, and the efficiency of the investment mechanism is determined by the balance between liquidity, institutional structure and the level of financial integration.

Conclusions

The study found that the stock exchange infrastructure of Poland's stock market underwent a consistent transformation from an instrument of institutional market formation to a functionally mature system of redistribution of financial resources. At the initial stage, its development was determined by privatisation processes, a limited number of participants and a low level of liquidity. Further integration into the European financial space was accompanied by the harmonisation of the regulatory environment, the expansion of the investment base and the growth of trading volumes, as a result of which the stock market began to perform the function of attracting capital. At the stage of functional stabilisation, key changes are manifested not in the quantitative growth of issuers, but in the transformation of the market structure. An increase in market capitalisation of over 1 trillion PLN indicates a transition to a model in which liquidity is concentrated in a limited group of companies, with the share of institutional and foreign participants exceeding 50% of trading volumes.

It was found that the current stage combines growth and increased volatility. The integration of the market into the global financial environment is marked by a significant increase in indices (up to 47%) and trading volumes (approx. PLN 470 billion) along with sharp short-term fluctuations. The results of the correlation analysis confirm a positive but nonlinear relationship between stock market parameters and investment activity: the strongest association is observed between market capitalisation and gross fixed capital formation ($r = 0.72$), while trading volumes ($r = 0.58$) and stock index dynamics ($r = 0.49$) show a more moderate relationship. During periods of recovery, capitalisation growth is accompanied by investment expansion; during crises, the stock market acts as a channel for the rapid transmission of financial shocks.

The effectiveness of the stock exchange infrastructure as a mechanism for attracting investments is limited by the concentration of liquidity within large companies, uneven access to stock exchange financing, and dependence on external capital. Thus, the stock market does not perform a universal function of financing the economy, but has a differentiated effect on investment processes. The limitations of the study include the use of aggregated statistical data and the lack of micro-level analysis. Prospects for further research include econometric causality models, analysis of market microstructure, and comparative studies of Central and Eastern European countries.

Acknowledgements

None.

Funding

None.

Conflict of Interest

None

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Роль біржової інфраструктури фондового ринку в залученні інвестицій в економіку країни на прикладі Республіки Польща (1989–2026)

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Анотація. Метою дослідження стало обґрунтування механізмів взаємодії біржової інфраструктури фондового ринку Польщі з інвестиційними процесами в умовах інституційної та структурної трансформації економіки. Методологічну основу дослідження становили економіко-статистичний аналіз, порівняльний метод, аналіз динамічних рядів, історико-логічний метод та метод узагальнення тематичних наукових досліджень. Встановлено, що розвиток фондового ринку Польщі супроводжувався переходом від інституційного формування до функціональної зрілості, що проявляється у зміні джерел формування ліквідності, структури інвесторів і характеру взаємодії з макроекономічними процесами. На ранньому етапі ринкова капіталізація зросла з рівня менш ніж 1 % валового внутрішнього продукту до близько 20%, що відображало створення базових умов функціонування ринку та його роль у приватизаційних процесах. Після інтеграції до Європейського Союзу, капіталізація збільшилася більш ніж удвічі та перевищила 600 мільярдів злотих, що супроводжувалося розширенням інвесторської бази, зростанням обсягів торгів і підвищенням ліквідності. У період структурної стабілізації встановлено зростання ринкової капіталізації до понад 1 трильйон злотих у 2021 році, а у період відновлювального зростання – до 2,3 трильйона злотих у 2026 році, що відображає значне розширення масштабів ринку. Обсяги торгів акціями досягли близько 470 мільярдів злотих на рік, а кількість інвестиційних рахунків перевищила 2,5 мільйона, що свідчить про активізацію внутрішнього попиту. Виявлено, що структура ринку визначається високою часткою іноземних інвесторів, яка перевищує 50 % обсягів торгів, а також концентрацією ліквідності у межах обмеженої групи найбільших компаній. Доведено, що динаміка фондового ринку демонструє високу чутливість до глобальних фінансових імпульсів, що проявляється у синхронних коливаннях індексів та зміні торговельної активності. Обґрунтовано, що ефективність біржової інфраструктури як механізму залучення інвестицій визначається поєднанням параметрів первинного ринку, ролі інституційних інвесторів, рівня ліквідності та ступеня інтеграції у глобальне фінансове середовище. Практичне значення дослідження полягає у можливості використання встановлених залежностей і структурних характеристик фондового ринку для обґрунтування рішень щодо розвитку інституційного середовища, диверсифікації інвесторської бази та підвищення стійкості ринку до зовнішніх фінансових імпульсів

Ключові слова: валовий внутрішній продукт; капіталізація; ліквідність; емітенти; волатильність

ECONOMIC FORUM
Journal homepage: https://e-forum.com.ua/en
Vol. 16, No. 2, 2026, 23-37
ISSN 2308-8559
e-ISSN 2415-8224
Article's History: Received: 04.02.2026 Revised: 01.05.2026 Accepted: 28.05.2026 Published: 25.06.2026

UDC 005.7:658.5:334.72(477)
DOI: 10.62763/ef/2.2026.23

Maturity models as a tool for diagnosing and improving management systems in Ukrainian enterprises

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Abstract. The purpose of the study was to justify the theoretical and methodological foundations of the use of maturity models to assess the level of development of enterprise management systems and to determine the directions for their improvement in the conditions of transformational changes. The research methodology implied the use of methods of theoretical generalisation and systematisation, historical-logical, structural, systemic and comparative analysis, economic and statistical analysis, as well as case studies of Ukrainian and foreign enterprises. The main findings of the study showed that Ukrainian enterprises operate under conditions of macroeconomic and military challenges: in 2022, gross domestic product fell by approximately 29%, and a significant proportion of enterprises curtailed their activities, whilst in 2023 most enterprises resumed operations, albeit with reduced turnover and continuing resource constraints. Under these conditions, the feasibility of using maturity models as a tool for the systematic assessment and development of enterprise management systems is justified. It has been established that their application ensures the formalisation of business processes, improved manageability and the integration of digital tools into the management system. The theoretical and methodological foundations for the use of maturity models have been substantiated, which envisage their combination with business diagnostics, a focus on data-driven approaches and adaptation to the conditions of an unstable environment. Case analysis has shown that the implementation of maturity models at Ukrainian enterprises (the National Joint-Stock Company "Naftogaz of Ukraine", the Joint-Stock Company "Ukrnafta", the Ukrainian Gas Transmission System Operator) ensured the formalisation of processes and the standardisation of management, whilst at Blue People, project delay rates fell from 80% to 1%, costs from 55% to 12%, and revenue increased by 440%. The approaches to adapting maturity models involved their phased implementation, integration with digital management tools, simplification of assessment procedures, and combining process standardisation with the flexibility of management systems. The practical significance of the study lies in the possibility of using appropriate approaches to assess the level of development of management systems and improve business processes in enterprises

Keywords: performance evaluation; business processes; digitalisation; transformation; strategies; risks

Introduction

In an unstable economic environment caused by military challenges, Ukrainian enterprises face the need to improve the effectiveness of their management systems. Many of them operate under conditions of limited resources, a high level of uncertainty and the need for rapid adaptation to change, which highlights the importance of systematic management improvement. In this context, the importance of tools for assessing the level of development of management systems is growing, as they enable the identification of weaknesses and the determination of directions for their further improvement.

The low level of integration of approaches to assessing and improving management practices, as well as the fragmented use of innovative tools in business

Suggested Citation:

Bieliaiev, O. (2026). Maturity models as a tool for diagnosing and improving management systems in Ukrainian enterprises. *Economic Forum*, 16(2), 23-37. doi: 10.62763/ef/2.2026.23.

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operations, complicate the development of effective management mechanisms. In the study by Y. Naumenko *et al.* (2025), models and methods of managerial decision-making were systematised, classified according to the specific nature of enterprises' activities, and key approaches were identified, notably customer-oriented, flexible and data-driven. The authors also justified the feasibility of using innovative tools, such as Big Data, artificial intelligence (AI), scenario planning and collective methods, demonstrating their impact on in enhancing the adaptability, efficiency and competitiveness of enterprises in the context of digitalisation and an unstable environment. The Scale-Up Maturity Model, developed by Y. Potiuk & A. Zaverbnyi (2025), covers managerial, financial, process, innovation and foreign economic criteria, and provides a five-level scale of enterprise development. The authors have also developed an integrated Scale-Up Readiness Index (SURI), which allows for a quantitative assessment of an enterprise's level of development, the identification of bottlenecks, and the justification of management decisions regarding further growth.

The current lack of consistency in approaches to assessing the digital maturity of enterprises, as well as the fragmented consideration of information and communication resources as an integral part of digital transformation, complicate the development of a comprehensive approach to analysing the relevant methodologies. In his study, A.R.K.B. Almansoori (2025) assessed the digital maturity of enterprises across key dimensions (processes, technologies, data, personnel, management), and conducted a comparative analysis of enterprises in various sectors in Ukraine and the United Arab Emirates. The author identified disparities in levels of digital maturity, notably the achievement of an integrated level of information technology (IT) by fintech enterprises and the predominance of the process level in the manufacturing sector, and substantiated the importance of information and communication resources as the foundation for enhancing adaptability, the effectiveness of management decisions, and the resilience of enterprises. The essence of business diagnostics as a tool for identifying internal constraints and "bottlenecks", as defined by V. Zamlynskyi *et al*. (2023), lies in identifying problems in enterprise operations; the authors justified the appropriateness of its application in the early stages of transformational change and developed a classification of diagnostic types (express, partial and comprehensive). The authors proposed a toolkit for assessing enterprises' readiness for digital transformation, emphasised the role of Enterprise Resource Planning (ERP) systems, digital ecosystems and platforms, and demonstrated the need for continuous monitoring and improvement of management processes to ensure effective development.

The insufficient level of formalisation in approaches to assessing the strategic maturity of project management, as well as the complexity of accounting for risks, resource constraints and the dynamic operating conditions of enterprises, necessitate the improvement of methodological tools. An economic-mathematical model for assessing project management maturity, based on linear programming methods for cost optimisation and the formation of an effective project portfolio, was developed by N. Prokopenko & K.-K. Krush (2025). The relationship between the level of maturity and the effectiveness of enterprises' operations is substantiated by demonstrating that a higher level ensures better adaptability, profitability and resilience to risks, and also involves the integration of digital technologies and management approaches. The essence of digital transformation as a comprehensive process of change encompassing technological, organisational and managerial aspects, as outlined by I. Rybak & O. Garafonova (2025), lies in enhancing the effectiveness of managerial decisions, flexibility and the competitiveness of enterprises. Key stages of digitalisation include strategy formulation, readiness assessment, integration of digital solutions into business processes and performance monitoring, whilst the use of Big Data, ERP, Customer Relationship Management (CRM) systems and AI enhances the productivity and adaptability of enterprises.

The adaptability of management systems to the conditions of the digital economy and the ability of enterprises to integrate digital technologies into strategic management require a rethinking of approaches to the organisation of management. The theoretical and methodological foundations of the digital transformation of management systems, as outlined by I.A. Verbovsky & K.S. Serdyukov (2025), involve identifying key challenges, in particular organisational, technological, human resource and information barriers that hinder effective digitalisation. The authors have also developed a model of adaptive management, which involves the use of flexible management approaches, data analytics, digital platforms and the integration of technologies (Big Data, AI, ERP, CRM) to improve decision-making efficiency and ensure the competitiveness of enterprises. L.M. Shymanovska-Dianych & O.V. Lozova (2024) summarised the main models for assessing the digital maturity of business processes in their study, identified their advantages and disadvantages, and highlighted the key factors influencing the level of digital maturity of enterprises. The components of business process management (design, modelling, implementation, monitoring and optimisation) were examined; the role of digital technologies in the transformation of enterprise activities was substantiated; and the results of assessing the level of digital maturity of leading Ukrainian companies were presented, demonstrating uneven development and varying degrees of adaptation to digital changes.

At the same time, issues regarding the adaptation of approaches to the specific characteristics of Ukrainian enterprises remain insufficiently addressed; there is a lack of a harmonised methodology for assessing the level of development of management systems;

and there is a need to resolve the tasks of universalising models, integrating them with business diagnostics and digital transformation, and developing unified approaches to assessing enterprise maturity in a dynamic environment. The aim of this study was to identify methodological approaches to diagnosing the development of enterprise management systems based on maturity models and to justify directions for their development in the context of transformational change. To achieve this objective, the following tasks were set: to analyse scientific approaches to assessing the level of development of management systems; to systematise and generalise existing models and diagnostic tools; and to investigate the specific features of applying maturity models and the practice of their implementation in the context of Ukrainian enterprises.

Materials and Methods

The study was of a theoretical and analytical nature. Within the scope of the study, a theoretical and methodological analysis of maturity models as a tool for assessing and developing management systems was applied. Approaches to interpreting them as structured conceptual frameworks were considered (Maturity model as a tool..., 2020). Using historical and logical analysis, the evolution of maturity models was investigated – from quality management concepts (Crosby, 1979) to the Capability Maturity Model (CMM) (Paulk *et al.,* 1993) and their subsequent integration into the Capability Maturity Model Integration (CMMI) (White, 2026). Using methods of systematisation and generalisation, a five-level structure of maturity models was identified and a generalised classification of levels was developed (Organizational maturity models..., 2020).

Based on the established theoretical principles and using the method of structural analysis, maturity models have been grouped according to the object of assessment; in particular, process-oriented models such as CMMI and the Business Process Maturity Model (BPMM) have been identified (Use our business..., 2025). Project-oriented models – the Organizational Project Management Maturity Model (OPM3) (Miller, 2004) and the Portfolio, Programme and Project Management Maturity Model (P3M3) (Buehring, 2024) – were considered separately, as this was necessary to investigate the specifics of their application in various areas of management activity. Furthermore, using a generalisation method, functional maturity models were examined, specifically the People Capability Maturity Model (PCMM) (What is PCMM..., 2025), the Cybersecurity Maturity Model Certification (CMMC) (Cisco Systems, Inc., n.d.) and the Big Data Maturity Model (BDMM) (n.d.). Furthermore, data management maturity assessment models were considered – the Data Management Capability Assessment Model (DCAM) and the Data Management Body of Knowledge (DMBOK) (Steenbeek, 2018). Using a comparative approach, a distinction was made between general-purpose and specialised maturity models, in particular CMMI and ISO 15504 (International Certification Center, n.d.), which was necessary to determine the specific features of their application in various organisational and sectoral contexts; using a comparative method, a comparison was carried out of the characteristics of maturity models based onthe object of assessment, specifically CMMI, BPMM, OPM3, P3M3, as well as functional models – PCMM, O-ISM3, CMMC, BDMM, DCAM and DMBOK. The comparison was carried out according to criteria such as the object of assessment, main focus, number of maturity levels and key features of the models. The application of this approach was aimed at systematising maturity models and determining the possibilities for their use in assessing various aspects of enterprise activities.

The next stage of the study involved examining the impact of the external environment on the functioning of enterprises. A method of analysis and generalisation was employed to identify the influence of macroeconomic, military and institutional factors (Moroz, 2025), which enabled the identification of key factors contributing to instability. The application of economic and statistical analysis made it possible to assess the role of micro, small and medium-sized enterprises (MSMEs) and the dynamics of their activities in 2022-2023 (United Nations Development Programme, 2024). Furthermore, systematic and structural analysis was used to examine the characteristics of digitalisation in management and data usage (Integral Solutions, n.d.), which helped to justify the feasibility of data-driven approaches. A comparative analysis was used to assess changes in the business environment in 2025 and early 2026 (Hoydenko, 2026).

Taking these conditions into account, a case study of Ukrainian enterprises was conducted, specifically the National Joint Stock Company (NJSC) 'Naftogaz of Ukraine' (Naftogaz received the international..., 2018) and the joint-stock company (JSC) "Ukrnafta" (Ukrnafta was the first..., 2025), which made it possible to identify the specific features of implementing maturity models. Using systematic analysis, the integration of the models into the activities of the Gas Transmission System (GTS) Operator of Ukraine was investigated (The GTS operator..., 2024). Generalisation and critical analysis made it possible to identify the limitations of their application in the Ukrainian context. To expand the comparative base, a case study of foreign companies was conducted, specifically Blue People (n.d.) and Bank of Montreal (n.d.), which allowed for an investigation into the use of the CMMI model. A comparative analysis of the case studies enabled a comparison of approaches across different sectors (CMMI Institute, 2018; Case study of CMMI..., 2022). The final stage involved summarising the results using a comparative method based on the following criteria: type of models, level of formalisation, availability of quantitative results, management orientation, integration into strategy, scale of implementation,

resource provision, level of process maturity, and publicity of the case studies. This made it possible to systematise the differences in approaches and identify the specific features of applying maturity models. On this basis, using a method of generalisation and systematic analysis, directions for their adaptation to the operating conditions of Ukrainian enterprises were developed.

Results

The essence and characteristics of applying maturity models in enterprise management

Maturity models are structured conceptual frameworks that reflect the gradual development of an organisation, its processes or functional subsystems through successive stages – from an informal state to a managed state focused on continuous improvement. Their essence lies in determining the current level of development of an enterprise and shaping a trajectory for further growth based on standardised criteria and practices. Thus, maturity models perform diagnostic and prognostic functions, ensuring the phased development of the organisation (Maturity model as a tool..., 2020). The evolution of maturity models is linked to the development of management concepts and the formalisation of processes. Their foundations were laid in the 1970s within the field of quality management, particularly in the works of P.B. Crosby (1979). Further development took place with the creation of the CMM by the Software Engineering Institute (n.d.), which proposed a five-level model for assessing process maturity and became the basis for further developments (Paulk *et al.,* 1993). This approach was expanded in the CMMI model, which covers various areas of activity, including project, quality and service management (White, 2026). Most maturity models are based on a five-level development logic: from the initial level with informal processes to the innovative level, which involves data-driven management and continuous improvement. This allows maturity models to be used as a tool for the systematic assessment and development of enterprise management systems. Typical characteristics of maturity levels are presented in Table 1.

Table 1. *Generalised characteristics of organisational maturity levels in process management*

Maturity level	Management characteristics	Process characteristics	Management tools
Initial	Lack of structure	Processes are informal and chaotic	Absent or minimal
Managed	Partial standardisation	Basic procedures in place	Regulations, instructions
Standardised	Systematic and formalised	Processes described and agreed	BPM systems, modelling
Predictable	Data-driven management	Processes are measured and analysed	Key Performance Indicators (KPIs), analytics, process mining
Innovative	Continuous improvement	Flexible, integrated processes	Digital platforms, AI

Source: *compiled by the author based on Organizational maturity models in the field of process management (2020)*

The classification presented demonstrates that the development of maturity is accompanied by a transition from intuitive management to data-driven management and continuous improvement. Higher levels of process management integration with digital and strategic technologies boost an organization's agility and flexibility. The diversity of models necessitates their systematisation according to key criteria – the object of assessment, sectoral focus and conceptual structure. This allows the feasibility of their use to be justified and their scope of application to be determined. At the same time, maturity models perform not only a diagnostic but also a strategic function, forming benchmarks for the development of management systems.

Based on the object of assessment, maturity models are divided into process-based, functional and sector-specific models. Process-based models include CMMI, BPMM, OPM3 and P3M3, which are used to assess the management of processes, projects, programmes and portfolios. CMMI is an integrated model covering various areas of activity (software development, project management, services) and comprises five maturity levels – from initial to optimised. Its application ensures process standardisation, risk reduction and improved performance (White, 2026). BPMM focuses on the development of business process management through incremental improvement and also employs a five-level model. It facilitates the identification of weaknesses, the alignment of processes with strategy, and the enhancement of operational efficiency (Use our business..., 2025). OPM3, developed by the Project Management Institute (n.d.), is designed to assess the maturity of project, programme and portfolio management based on best practices and performance indicators. It ensures alignment of project activities with strategy and provides for step-by-step improvement (Miller, 2004). P3M3 covers three areas (portfolio, programmes, projects) and enables a comprehensive assessment of an organisation's ability to implement change. The model is used for benchmarking and creating a development plan, and it consists of five maturity levels (Buehring, 2024).

Functional models form a separate group: the PCMM, the Operational Information Security Maturity Model (O-ISM3), CMMC, BDMM, DCAM and DMBOK. PCMM focuses on the development of human capital management systems across five maturity levels, covering workforce planning, competency development and performance management (What is PCMM..., 2025). O-ISM3 enables the assessment of information security maturity and its integration into the overall management system

(Beyond proprietary models..., n.d.). CMMC is aimed at standardising cyber defence and assessing the security level of information systems (Cisco Systems, Inc., n.d.).

The Big Data Maturity Model (n.d.) is used to assess analytical capabilities and the level of data utilisation in decision-making, facilitating the development of data-driven approaches. DCAM enables the assessment of data management maturity, specifically its quality, integration and architecture, whilst DMBOK systematises the principles and practices of data management, forming the basis for assessment (Steenbeek, 2018). Such models provide a deeper analysis of specific functional areas. Depending on their scope of application, models are divided into universal and specialised. Universal models (CMM, CMMI, ISO 15504 (International Certification Center, n.d.)) have a wide range of applications, whilst specialised models take into account industry-specific characteristics, regulatory requirements and the particularities of business processes. This enhances the accuracy of the assessment and the practical significance of the results. A comparative overview of maturity models is provided in Table 2.

Table 2. *Comparative characteristics of maturity models by assessment object*

Model	Assessment object	Main focus	Number of levels	Key feature
CMMI	Organisational processes	Improving process management	5	Integration of best practices in process management
BPMM	Business processes	Development of process management	5	Focus on process systematisation and optimisation
OPM3	Projects, programmes, portfolios	Aligning project management with strategy	5	Based on PMI best practices
P3M3	Projects, programmes, portfolios	Comprehensive assessment of change management	5	Covers three levels of management (P, P, P)
PCMM	Human capital	Development of HR systems	5	Focus on staff competence development
O-ISM3	Information security	IS Management	3–5	Integration of security into business processes
CMMC	Cybersecurity	Information Systems Protection	3-5	Cyber security standardisation
Big Data MM	Data analytics	Data-driven management	4-5	Big Data Maturity Assessment
DCAM	Data management	Data governance	5	Focus on data quality and architecture
DMBOK	Data management	Data management methodology	–	Systematisation of knowledge and practices

Source: *compiled by the author based on Beyond proprietary models: Open Information systems management maturity model (O-ISM3) (n.d.), Big Data Maturity Model (BDMM) – definition & overview (n.d.), B. Miller (2004), I. Steenbeek (2018), S. Buehring (2024), Use our business process maturity model to measure progress (2025), What is PCMM? – The people capability maturity model and its benefits (2025), S.K. White (2026)*

A comparison of the maturity models listed shows that they differ not only in the object of assessment but also in the depth of analysis and the scope of practical application. In particular, process-based models (CMMI, BPMM) focus on improving internal processes and ensuring their standardisation, whereas OPM3 and P3M3 aim to integrate project management with the organisation's strategic objectives. Functional models (PCMM, CMMC, DCAM) allow for a more detailed assessment of individual aspects of operations, but do not provide a holistic view of the management system. At the same time, universal models are characterised by broader coverage but may require adaptation to the specific characteristics of the enterprise. This necessitates the combined use of different models depending on the objectives of the assessment and the organisation's level of development.

Maturity models serve as a universal tool for assessing the level of development of management systems, enabling the identification of their current state and the determination of areas for further improvement. Their diversity in terms of the object of assessment, structure and scope of application ensures the possibility of adaptation to the specific nature of enterprises' activities and operating conditions. At the same time, the effectiveness of their use depends on the level of integration into the management system, resource provision and alignment with the organisation's strategic goals. Thus, maturity models form the methodological basis for the systematic development of enterp-+rises in a dynamic environment.

Management challenges facing Ukrainian enterprises and an assessment of the effectiveness of implementing maturity models

Ukrainian enterprises work in the conditions of multidimensional instability, which is formed by the interrelated economic, military and institutional factors. Macroeconomic volatility, in particular gross domestic product (GDP), inflation and exchange rate fluctuations, limits the scope for long-term planning and increases the degree of risk associated with business activities. The investment activity of enterprises and their access to liquidity are hindered by financial instability, increased by the volatility of international financial markets and

limited access to credit. An additional factor is the decline in the purchasing power of the population and businesses, which leads to a contraction in demand and an increase in commercial risks. Military and geopolitical factors are affecting the operations of enterprises. The destruction of infrastructure, loss of production capacity and disruption of supply chains complicate operational activities and increase costs. Disruptions in the supply of raw materials, restrictions on transport routes and high security risks are forcing enterprises to review the organisation of their business processes. The high level of uncertainty necessitates the use of contingency scenarios, including relocation, diversification of activities or asset reduction, which diverts resources away from strategic objectives (Moroz, 2025).

MSMEs play a key role in Ukraine's economy, accounting for 99.98% of all enterprises, providing 74% of jobs and generating 64% of value added as of 2023. As a result of the full-scale invasion in 2022, the economy suffered a sharp downturn: GDP contracted by approximately 29%, and 64% of enterprises temporarily suspended or scaled back their operations. Throughout 2023, a gradual recovery of business activity was observed: around 91% of enterprises resumed operations, whilst as of October 2023 only 9.6% remain inactive or are on the verge of closure. At the same time, even among operating enterprises, a decline in economic performance was recorded in 2022-2023 – in particular, the average fall in turnover was 31.2% compared with 2021. Data from surveys conducted in late 2023 and early 2024 indicated that significant constraints on business development remain. The most common problems are the unpredictability of the economic environment (58.3% of enterprises), the risk of unpredictable government actions (50.7%), and low consumer purchasing power (49.4%). Additional constraints include insufficient manpower (42.1%) and inadequate financial resources (33%). Structural constraints are also long-term: in 2023 only 17.9% of MSMEs are involved in export activities, over 57.2% operate only in the domestic market and over 71% are not integrated in international supply chains. This means limited scope for risk diversification and greater reliance of firms on domestic economic conditions (United Nations Development Programme, 2024).

This, in can be noticed that digitalisation of management allows to take decisions in real time. The integrated information systems usage becomes a premise of effective enterprises functioning. In this context data is becoming a key strategic resource, as its use allows increasing productivity, improving customer interaction and creating competitive advantages. The effective interconnection of the data coming from the different sources provides a holistic view of the enterprise's operations and creates the conditions for its flexibility and innovation. While, on the other hand, enterprises face a number of challenges in the field of data management, such as limited resources, lack of skilled personnel, growing volume and diversity of data, and technical complexity of its integration. Other challenges are the increasing costs of data processing and the increasing requirements for information security, which make the development of effective analytical systems more difficult and slow down the development of data-driven management. Another challenge is human capital management, which needs flexible working conditions, staff support and effective communication due to the instability of the environment. At the same time, the financial management is transforming to a regime of continuous monitoring of liquidity, risks and sources of funding (Integral Solutions, n.d.).

Persistence of a high level of uncertainty in the business environment

The Small Business Sentiment Index has stabilised, but most entrepreneurs in Ukraine are still moving carefully, trying to maintain their position and using internal resources. Only 21% think their business is good, 31% say it is neutral, and 48% say it has gotten worse compared to 2025. The trend for the period September 2025 – January 2026 is again negative, with 56% of entrepreneurs reporting a deterioration in business conditions, 32% of entrepreneurs reporting no change and 12% of entrepreneurs reporting an improvement. Also low are the expectations for the second half of 2026: 48% of entrepreneurs expect a deterioration of the situation, 31% do not expect any changes, and only 21% expect an improvement. In general, 76% of respondents believe that the economic situation in Ukraine is unfavourable or critical, while only 4% believe it is favourable. In such uncertainty businesses are developing cautious strategies of development, on the basis of own resources mainly. It is increasing the share of entrepreneurs who consider their own funds the main source of financing – to 51%, the intentions to attract external financing are decreasing. In particular, the share of entrepreneurs planning to attract additional resources is decreasing, access to bank credit is still limited, a considerable part of entrepreneurs has problems with it. However, businesses are not abandoning development, but are moving in more cautious and controlled directions. The key priorities are to increase the customer base (63%) and to refresh or extend the product range (42%). A heightened emphasis on global markets indicates a pursuit of alternate economic prospects due to domestic uncertainty. The increasing importance of digital channels in business operations should also be emphasised. A significant share of companies actively use marketplaces and social media, and about one third of companies operate primarily in the digital environment. This allows businesses to adapt more quickly to changes and find new opportunities even in conditions of high uncertainty. Despite some signs of adaptation, entrepreneurs continue to face a range of systemic challenges, the key ones being military risks, energy instability, rising costs, economic

uncertainty and low purchasing power among the population. This further complicates the process of managerial decision-making and hampers the active growth of enterprises (Hoydenko, 2026).

The identified management challenges are directly linked to the need to use structured tools for assessing and developing management systems. In particular, macroeconomic instability and resource constraints complicate long-term planning, necessitating the implementation of maturity models as a tool for phased development and prioritisation. The high level of uncertainty and risk highlights the need to formalise processes and implement systematic risk management, which aligns with the logic of transitioning to higher levels of management maturity. Insufficient digitalisation and fragmented data usage limit the quality of management decisions, whereas maturity models enable the integration of data-driven approaches and ensure the development of the organisation's analytical capabilities. Furthermore, personnel and organisational barriers require the standardisation of management practices and the improvement of their consistency, which is also achieved by the implementation of appropriate models. Therefore, maturity models are a way to systematically address the key challenges of enterprises that operate in an uncertain environment.

In these circumstances, a practical assessment of the effectiveness of the implementation of maturity models in Ukrainian enterprises is necessary. The analysis of practical case studies of Ukrainian enterprises shows that the introduction of maturity models, especially based on ISO standards, mainly provides an improvement of management efficiency and the quality of business processes, although this effect is mainly indirect. In particular, in Naftogaz of Ukraine, the introduction of a quality management system in accordance with DSTU ISO 9001:2015 (2015) contributed not only to the formalisation of management procedures, but also to the stricter control of the execution of production processes, which made it possible to increase the transparency of the company's activities and reduce the risks of inefficient use of resources (Naftogaz received the international..., 2018). Here the maturity model functions as a tool for institutionalising management, ensuring a transition from ad hoc decisions to standard procedures and regulations.

The implementation of the industry standard DSTU EN ISO 29001:2021 (2021) based on the principles of DSTU ISO 9001:2015 (2015) at the JSC "Ukrnafta" made it possible to systematise quality management processes in the oil and gas sector under increased technological and operational risks (Ukrnafta became the first..., 2025). Not only has this stabilised the product quality and minimised operational risks, but also improved the alignment of operations with international requirements which has, in turn, expanded the company's opportunities to participate in international projects and cooperate with foreign partners. Thus, the effectiveness of the maturity model in this case is shown by the increased reliability and predictability of the business processes.

The experience of the Gas Transmission System Operator of Ukraine demonstrates the full-scale implementation of maturity models the integration of DSTU ISO 9001:2015 (2015), DSTU ISO 14001:2015 (2015) and DSTU ISO 45001:2019 (2019) has ensured the formation of a unified management system for quality, environmental safety and occupational health and safety (The GTS operator of Ukraine..., 2024). This approach allows to ensure the consistency of internal processes and their compliance with international requirements in the operations of an energy sector enterprise. Here the maturity model works as an integrator, integrating the different management domains into one system.

At the same time, a generalisation of the cases presented allows for a more critical conclusion regarding the effectiveness of implementing maturity models in the Ukrainian context. Despite their positive impact on process standardisation, improved management quality and compliance with international requirements, these models rarely have a direct impact on the financial performance of enterprises. This is due to the fact that their implementation is often limited to the formalisation of procedures without deep integration into strategic management, and also depends on the enterprise's resource capabilities, the level of management culture and the stability of the external environment. Thus, in Ukrainian practice, maturity models demonstrate the greatest effectiveness as a tool for streamlining and systematising management; however, their transformational potential is realised only under conditions of comprehensive and consistent implementation.

An analysis of the practice of implementing maturity models in Ukraine reveals an asymmetry between the use of standardised approaches, such as ISO, and specialised maturity models focused on specific management or technological areas. Whilst there are publicly documented implementation case studies for ISO standards at the level of specific enterprises, no such case studies are available in open sources for other maturity models, such as CMMI, BPMM, OPM3, P3M3, PCMM, O-ISM3, CMMC, BDMM, DCAM and DMBOK. This situation can be explained by a number of factors. Firstly, most of the models mentioned require a high level of organisational maturity, as well as significant financial and human resources, which limits their application primarily to large companies. Secondly, the lack of institutional support and widespread certification practices complicates their integration into business operations. Thirdly, the instability of the external environment leads businesses to focus on short-term solutions, which reduces interest in implementing comprehensive development models. Thus, it can be concluded that in Ukraine, maturity models that differ from ISO standards are either applied to a limited extent or their use lacks a

sufficient level of public verification. This, in turn, complicates the assessment of their effectiveness and points to the need for further research and the promotion of practices for their implementation in the Ukrainian business environment.

Thus, the current conditions of the enterprises' operation of Ukraine are characterised by a high degree of instability, which necessitates the improvement of management systems based on systematic approaches. Maturity models enable a structured assessment of the level of management development, ensuring the formalisation of processes and the incorporation of digital and analytical tools into business activities. The experience of their implementation in Ukraine has a positive influence on standardisation and improvement of management quality. However, their effectiveness depends to a considerable extent on the level of integration into strategic management and resource provision. At the same time, the limited use of specialised maturity models and their low prevalence indicate the need for further development of methodological approaches and expansion of their implementation in the Ukrainian business environment.

The practice of implementing and adapting enterprise maturity models

A good example of the application of maturity models in international practice is the work of the IT company Blue People (n.d.) (Mexico), specialised in software development and consultancy services. In the phase of rapid growth, the company encountered limitations in the use of the agile Scrum methodology, which was not scalable enough to ensure process stability and effective knowledge transfer between employees. This required the development of a more formal management approach and led to the use of the CMMI. The CMMI was implemented to increase the maturity of the processes, to ensure standardisation of management procedures and to formalise the business processes, while still maintaining the flexibility of the organisation. The company has been able to achieve Maturity Level 3 (Defined) (ML3) and Maturity Level 5 (Optimising) (ML5) consistently. ML3 and ML5 have taken the company from defined and standardised processes to quantitative measurement and statistical control. A distinctive feature of the implementation was the synthesis of CMMI practices with agile approaches (Scrum, Kanban), which made it possible to adapt the model to the specifics of the company's operations and avoided excessive bureaucratisation (CMMI Institute, 2018).

The implementation of the maturity model resulted in a metrics system to measure process effectiveness, internal management tools creation (such as process monitoring platforms and knowledge documentation), and a move towards data-driven management. This allowed to predict the results of the projects, optimise the use of the resources and improve the quality of the decision-making in management. As a result of implementing the CMMI model, the company achieved improvements in operational performance. In particular, the project schedule deviation rate was reduced from 80% to 1%, and cost deviation from 55% to 12%. Furthermore, the company demonstrated a 440% increase in revenue and achieved a return-on-investment ratio of 6:1, which attests to the high effectiveness of implementing the maturity model. At the same time, this resulted in greater predictability of operations, improved project delivery quality, and higher customer satisfaction levels. Thus, Blue People's experience confirms that the implementation of maturity models, in particular CMMI, enables the systematisation of management, improves the efficiency of business processes, and achieves significant improvements in business performance, provided they are adapted to the organisation's specific context and combined with flexible management approaches (CMMI Institute, 2018).

Another example of the implementation of a maturity model is the work of the Bank of Montreal (n.d.) (Canada), which adopted the CMMI approach to improve its software development processes. The reasons for the implementation included the presence of unstructured processes, low predictability of timelines and costs, a significant number of changes in projects, and the lack of systematic data collection and analysis within software development. Furthermore, documentation and knowledge management processes were insufficiently formalised, which complicated the coordination of activities. The implementation of CMMI was carried out in stages and included staff training, conducting to assess the current state of processes (gap analysis), developing improvement plans, and establishing an independent quality assurance team. Particular attention was paid to establishing a requirements management process, which involved engaging various roles and stakeholders in the development process. During implementation, configuration management practices, peer review, and the use of metrics to assess process effectiveness were also introduced. The results of the implementation demonstrated improvements in performance indicators. In particular, the number of defects related to requirements decreased by approximately 50%. As part of the further development of the management system, maintenance productivity increased by a factor of 3.8 and development productivity by more than a factor of 2, whilst the number of defects per release was reduced from 6-12 to 2. Furthermore, a comparative analysis of project performance indicators revealed an increase in the proportion of projects delivered on time and within budget (Case study of CMMI..., 2022).

At the same time, an analysis of international experience in implementing maturity models reveals an uneven representation of practical case studies depending on the type of model. While there are documented examples of implementation with quantitative results for the CMMI model (notably at Blue People and BMO Financial Group), for other maturity models – BPMM,

OPM3, P3M3, PCMM, O-ISM3, CMMC, BDMM, DCAM and DMBOK – there are no systematic empirical case studies with measurable performance indicators available in open sources. This complicates their comparative assessment and indicates limited public verification of the results of their practical application. This situation may be due to the complexity of implementing these models, their high resource intensity, and their focus on companies' internal processes, the results of which are not always subject to public disclosure. To systematise the research findings and conduct a comparative analysis of the practice of implementing maturity models in foreign companies and Ukrainian enterprises, the summarised characteristics are presented in Table 3.

Table 3. *Comparative analysis of the practice of implementing maturity models in foreign companies and in Ukraine*

Criterion	CMMI cases	Ukrainian enterprises
Type of models	Predominantly CMMI (high maturity levels ML3-ML5)	Predominantly ISO-like approaches
Level of formalisation	High (structured processes, metrics, control)	Medium (formalisation of procedures without full integration)
Availability of quantitative results	Yes (productivity ×2-3.8; defects -50%; lead times 80→1%)	Limited (mainly qualitative effects)
Management focus	Data-driven, statistical management	Reactive / partially systematic
Integration into strategy	High (link to business results)	Partial or none
Scale of implementation	Organisational level (enterprise-wide)	Local or functional
Resource allocation	Significant investment, specialised teams	Limited resources
Process maturity level	High (Quantitatively managed, optimising)	Lower (managed/partially standardised)
Publicity of case studies	High (case studies, reports)	Limited

Source: *compiled by the author*

A comparative analysis reveals differences in the implementation of maturity models between foreign companies and Ukrainian enterprises. International practice shows a more systematic use of maturity models, with a focus on quantitative indicators and integration into strategic management. In Ukraine, however, their application is predominantly piecemeal and limited to the formalisation of individual processes. This necessitates the expansion of the implementation of comprehensive maturity models and an increase in their integration into enterprise management systems.

Adapting maturity models to the operating conditions of Ukrainian enterprises requires taking into account the specific nature of the national business environment, which is characterised by a high level of uncertainty, limited resources, instability of the institutional environment, and the influence of external risks. In such conditions, directly adopting foreign maturity models without modification is insufficiently effective, as they are geared towards stable economies with developed management infrastructure and a high level of digitalisation. This necessitates the development of adapted approaches that take into account both structural constraints and the development potential of domestic enterprises. One approach to adaptation is the phased implementation of maturity models, taking into account the enterprise's current level of development. For most Ukrainian companies, it is advisable to focus on the basic levels of maturity, which involve the formalisation of processes, the definition of roles and responsibilities, and the introduction of control mechanisms. The transition to higher levels of maturity, involving the use of analytics and process optimisation, is carried out gradually in line with available resources and competencies.

A separate area of focus is the integration of maturity models with digital management tools. The use of information systems, data analytics and digital platforms enables greater process transparency and supports management decision-making. In this context, the development of data-driven approaches involves using data to monitor the company's operations, assess performance and forecast changes. Another area is the adaptation of maturity models to enterprises' resource constraints. This involves simplifying assessment procedures, using accessible analytical tools, and focusing on the processes that have the greatest impact on performance. In this context, the application of a modular approach allows for the implementation of individual elements of maturity models without a complete transformation of the entire management system.

The development of managerial competencies and the formation of a process management culture accompany the implementation of maturity models and involve a transition to more structured management approaches. The implementation of maturity models is accompanied by a transition to more structured management approaches, which involve the use of analytical tools and formalised procedures. This is linked to the need for staff training, the development of management skills and the establishment of internal expert functions. The application of maturity models also encompasses securing the flexibility of management systems towards environmental changes. The author employs a combination of standardised procedures and the adaptability to modify these procedures in response to internal and external changes. In this context, flexible management approaches provide the opportunity to maintain the balance between the formalisation of processes and the

flexibility of the enterprise's operations. Thus, adaptation of maturity models to the operating conditions of Ukrainian enterprises involves the integration of phased implementation, digitalisation of management, taking into account resource constraints, the development of management competencies and the provision of flexibility of management systems. It creates conditions for improvement of management organisation effectiveness and internal processes alignment with the requirements of the external environment.

Therefore, maturity models serve as a tool for assessing and developing enterprise management systems under various operating conditions. Their application enables the structuring of processes, ensures the consistency of management decisions, and enhances the manageability of operations. At the same time, the practice of using such models varies depending on the level of enterprise development and the availability of resources. Adapting maturity models involves taking into account the specific nature of the environment in which enterprises operate and the characteristics of the management organisation.

Discussion

In an unstable economic environment, exacerbated by military challenges, digital transformation and growing uncertainty, enterprises face the need to improve the effectiveness of their management systems and their ability to adapt quickly. In particular, similar to the findings of L. Lai (2022), it was established that the implementation of maturity models facilitated a transition from informal processes to data-driven, systematic management and continuous improvement. At the same time, unlike L. Lai, where the main focus was on the technological component of Industry 4.0, this study showed that the effect of implementing maturity models was manifested primarily in an increase in the level of management formalisation and process standardisation, rather than in direct financial results.

The results also partially corroborated the findings of D.R. Domínguez *et al.* (2025) regarding the growing role of digital technologies and data in the development of maturity models. However, whilst D.R. Domínguez *et al.* emphasised the evolution of models towards Industry 5.0 and human-centredness, this study found that, in the context of Ukrainian enterprises, the key constraint remained the insufficient integration of maturity models into strategic management, which reduced their transformational potential. A comparison with the findings of G. Korsten *et al.* (2024) showed that, unlike studies where maturity models (in particular the Advanced Data Analytics Capability Maturity Model (ADA-CMM)) demonstrated a quantitatively measurable impact on the development of analytical capabilities, this study revealed the limited applicability of quantitative results in the practice of Ukrainian enterprises. This was confirmed by the absence of publicly verified performance indicators for most models, with the exception of individual CMMI cases.

Similarly, the results were consistent with the findings of J. Gomes & M. Romão (2025) and A.F.S. Pino *et al.* (2024), who emphasised the importance of industry-specific adaptation of maturity models. This study found that universal models were applied in Ukrainian conditions predominantly in a simplified or partial format, which was due to resource constraints and an unstable environment. The most significant difference was observed when comparing with T.-C. Lin & K.J. Wang (2021), where the implementation of maturity models was accompanied by clear quantitative improvements in efficiency. This study demonstrated that, for Ukrainian enterprises, the effect of implementing maturity models was predominantly indirect in nature and manifested itself through improved manageability, process standardisation and a reduction in operational risks, rather than through a direct increase in financial indicators.

A comparison of the results of this study with the conclusions of E.T. Skupień (2025) showed that in both cases, maturity models were viewed as a tool for the phased development of systems with a multi-level structure. At the same time, whilst E.T. Skupień established the effectiveness of maturity models in the context of sectoral systems, this study demonstrated their universal nature for the assessment and development of enterprise management systems. The results also corresponded with the findings of T. Mettler & O. Ballester (2021), who identified methodological limitations in maturity models. In this study, these limitations manifested themselves through an insufficient level of integration of the models into strategic enterprise management and the absence of direct quantitative results of their application, which partially confirmed the authors' critical remarks.

A comparison with the results of K. Kimita *et al.* (2022) showed that, although both studies were based on the evolutionary logic of maturity development, K. Kimita *et al.* obtained more specific results through the definition of the competencies required for servitisation. In this study, however, it was found that in the Ukrainian context, the application of maturity models is limited primarily to the formalisation of processes without in-depth detailing of the competency component. A similar difference was observed when comparing with the results of U. Şener *et al.* (2026), where quantitative assessments of digital maturity were obtained based on an index approach. This study revealed the limitations of quantitative measurement of the results of implementing maturity models, indicating the dominance of a qualitative approach in assessing their effectiveness.

A comparison with the findings of D. Kato *et al.* (2025) showed that, when specialised maturity models are applied, it is possible to achieve clearly measurable improvements in efficiency. In contrast, this study found that for Ukrainian enterprises, the effect of

implementing maturity models was predominantly indirect in nature and manifested itself through process standardisation and improved manageability, rather than through direct quantitative results. The results were also consistent with the findings of D. Vavpotič *et al.* (2026), who argued for the need to adapt maturity models to the specific operating conditions of enterprises. This study confirmed that the effectiveness of maturity models in the Ukrainian context depended on their adaptation to resource constraints and an unstable environment.

A comparison with the studies by S. Ollis *et al.* (2024) and S. Njah *et al.* (2026) showed that, in international practice, maturity models ensured the attainment of quantifiable results, in particular an increase in the efficiency of system operations. This study found that such results are limited, and the application of maturity models primarily brings about qualitative changes in management. At the same time, the results were partly consistent with the findings of D.R. Domínguez *et al.* (2026) and T. Thordsen & M. Bick (2023), who pointed to the limitations of applying maturity models and the lack of empirical verification of their effectiveness. This study confirmed that the lack of publicly available quantitative results and the limited use of specialised maturity models complicate the assessment of their impact on business operations.

A comparison with the study by A. Ouazzani-Chahidi *et al.* (2023) allowed us to specify the practical dimension of the use of maturity models, as in both approaches, they were considered as a tool for phased assessment and improvement of management effectiveness based on a process-oriented approach. Another common feature was the focus on a multi-level maturity structure and its role in improving management decisions. At the same time, in the work by A. Ouazzani-Chahidi *et al.,* this approach was developed into a practical toolkit through the creation of a CMMI-based model with clear assessment criteria and empirical validation, whereas in the present study the emphasis remained on the theoretical generalisation and systematisation of maturity models. The need to enhance the objectivity of comparing maturity models became central to the study by B. Cognet *et al.* (2023), which logically continued the previous discussion on their practical application. Similar to this study, the authors acknowledged the multidimensionality of the models and their diversity, but went a step further by proposing a formalised approach to their comparison based on KPIs and quantitative coverage indicators. Against this backdrop, the approach used in this study remained analytically generalised, highlighting the distinction between quantitative formalisation and qualitative systematisation.

A further expansion of the context occurred in the study by S. Ferraro *et al.* (2023), where maturity models were considered within an industry-specific context – in the field of supply chains and logistics. As in this study, they were treated as a tool for assessment and continuous improvement, combining diagnostic and strategic functions. However, S. Ferraro *et al.* focused on identifying global trends in the development of maturity models based on a systematic review of a significant number of studies, which allowed them to identify key gaps, in particular insufficient validation of models and limited integration of individual processes. In this study, however, the focus has shifted from identifying global trends to analysing the potential for the practical application of models in a specific management environment.

As a result, it was established that maturity models are an effective tool for assessing and developing enterprise management systems, ensuring the structuring of business processes and enhancing their level of formalisation and coherence. It has been demonstrated that, in an unstable environment, their application contributes to improved manageability of operations, the integration of digital and analytical tools, and the creation of conditions for the phased development of enterprises. At the same time, it has been established that in Ukrainian practice, the effect of implementing maturity models is predominantly indirect in nature and manifests itself through the standardisation of management and the reduction of operational risks, whilst the direct quantitative results of their use are limited.

Conclusions

A summary of the research findings indicates that maturity models are used as a tool for the structured assessment and development of corporate management systems in an unstable external environment. The functioning of Ukrainian business is accompanied by significant macroeconomic and military impacts, which were reflected in a reduction in GDP of approximately 29% in 2022 and the cessation or restriction of operations at 64% of enterprises. In 2023, a partial recovery took place: around 91% of enterprises resumed operations, whilst 9.6% remain inactive or are on the verge of ceasing operations. At the same time, the average decline in enterprise turnover stood at 31.2% compared to 2021. MSMEs account for 99.98% of the total number of business entities, provide 74% of employment and generate 64% of added value. However, their operations are constrained by a number of factors, including the unpredictability of the economic environment (58.3%), risks associated with government policy (50.7%), low consumer purchasing power (49.4%), labour shortages (42.1%) and limited access to financial resources (33%). Furthermore, only 17.9% of enterprises are engaged in export activities, over 57.2% are focused exclusively on the domestic market, and over 71% are not integrated into international supply chains.

Data on business expectations for 2025 – early 2026 indicate that instability persists: 48% of entrepreneurs report a deterioration in business conditions, 31% assess them as neutral, and 21% as positive. At the same time, 56% reported a deterioration in operating conditions, and 76% assess the overall economic situation

as unfavourable or critical. The proportion of enterprises relying on their own financial resources stands at 51%. The practice of implementing maturity models in Ukraine is illustrated by case studies of management standards. At NJSC Naftogaz of Ukraine, the implementation of DSTU ISO 9001:2015 ensured the formalisation of management procedures. At JSC "Ukrnafta", the use of DSTU EN ISO 29001:2021 was aimed at systematising quality management processes. In the activities of the Ukrainian GTS Operator, the integration of DSTU ISO 9001:2015, DSTU ISO 14001:2015 and DSTU ISO 45001:2019 ensured the consolidation of functional management areas within a single system.

International practice is illustrated by case studies of the implementation of maturity models based on CMMI. Blue People (Mexico) achieved a transition to maturity levels ML3 and ML5, which was accompanied by a reduction in project delivery time variances from 80% to 1% and cost variances from 55% to 12%, as well as a 440% increase in revenue and a return-on-investment ratio of 6:1. At BMO Financial Group (Canada), the application of CMMI was linked to process standardisation, the introduction of a metrics system, and the harmonisation of project management. Adapting maturity models to the operating conditions of Ukrainian enterprises involves phased implementation in line with the enterprise's level of development, integration with digital management tools, the use of data-driven management approaches, simplifying assessment procedures to account for resource constraints, applying a modular approach to the implementation of individual model elements, developing managerial competencies, and ensuring the flexibility of management systems by combining process standardisation with the ability to adapt them to changes in the environment.

The limitation of the study lies in its focus on generalising theoretical and methodological approaches and analysing individual practical cases without conducting large-scale empirical verification. Prospects for further research relate to expanding the empirical base and developing applied tools for assessing the maturity of management systems, taking into account the specific characteristics of Ukrainian enterprises.

Acknowledgements

None.

Funding

None.

Conflict of Interest

None.

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Моделі зрілості як інструмент діагностики та вдосконалення управлінських систем українських підприємств

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Анотація. Метою даного дослідження було обґрунтування теоретико-методичних засад використання моделей зрілості для оцінювання рівня розвитку управлінських систем підприємств та визначення напрямів їх удосконалення в умовах трансформаційних змін. Методологія дослідження ґрунтувалася на застосуванні методів теоретичного узагальнення та систематизації, історико-логічного, структурного, системного та порівняльного аналізу, економіко-статистичного аналізу, а також кейс-аналізу українських та іноземних підприємств. Основні результати дослідження засвідчили, що функціонування українських підприємств відбувається в умовах макроекономічних і воєнних викликів: у 2022 році внутрішній валовий продукт скоротився приблизно на 29 %, а значна частина підприємств обмежила діяльність, тоді як у 2023 році більшість підприємств відновили роботу, однак із зниженням обороту та збереженням ресурсних обмежень. За таких умов обґрунтовано доцільність використання моделей зрілості як інструменту системного оцінювання та розвитку управлінських систем підприємств. Встановлено, що їх застосування забезпечує формалізацію бізнес-процесів, підвищення керованості та інтеграцію цифрових інструментів у систему управління. Обґрунтовано теоретико-методичні засади використання моделей зрілості, що передбачають їх поєднання з бізнес-діагностикою, орієнтацію на data-driven підходи та адаптацію до умов нестабільного середовища. Аналіз кейсів показав, що впровадження моделей зрілості на підприємствах України (Національної акціонерної компанії «Нафтогаз України», акціонерного товариства «Укрнафта», Оператора газотранспортної системи України) забезпечувало формалізацію процесів і стандартизацію управління, тоді як у компанії Blue People відхилення термінів виконання проєктів зменшилося з 80 % до 1 %, витрат – з 55 % до 12 %, а доходи зросли на 440 %. Напрями адаптації моделей зрілості передбачали їх поетапне впровадження, інтеграцію з цифровими інструментами управління, спрощення процедур оцінювання та поєднання стандартизації процесів із гнучкістю управлінських систем. Практичне значення дослідження полягає у можливості використання відповідних підходів для оцінювання рівня розвитку управлінських систем і вдосконалення бізнес-процесів підприємств

Ключові слова: оцінювання ефективності; бізнес-процеси; цифровізація; трансформація; стратегії; ризики

ECONOMIC FORUM
Journal homepage: https://e-forum.com.ua/en
Vol. 16, No. 2, 2026, 38-51
ISSN 2308-8559
e-ISSN 2415-8224
Article's History: Received: 10.01.2026 Revised: 08.04.2026 Accepted: 28.05.2026 Published: 25.06.2026

UDC 658.012.4:005.336
DOI: 10.62763/ef/2.2026.38

Role of leadership and creative management in shaping sustainable business models

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Abstract. The study aimed to substantiate a management mechanism for combining leadership and creative management in the process of updating a company's business model, as well as to determine how these factors contribute to its adaptability, innovativeness and competitiveness in a changing economic environment. The research was conducted as a theoretical and analytical study using methods of content analysis of academic sources, comparative analysis, secondary analysis of international analytical reports, systematisation, synthesis, generalisation and conceptual modelling. Examples of the Ukrainian enterprises Rozetka, Prom.ua and Nova Poshta were used to demonstrate that the renewal of sustainable business models is achieved through the platformisation of trade, the development of digital infrastructure for small and medium-sized enterprises, logistical optimisation, automated tracking and the expansion of channels for interaction with consumers. The study established that leadership shaped the strategic framework of a sustainable business model through defining the direction of development, coordinating resources, supporting change, managing knowledge, and developing the organisation's capacity for renewal. Creative management was identified as a mechanism for the practical renewal of the value proposition, business processes, partnerships, channels of interaction with consumers, and sources of value creation. The study determined that a sustainable business model is not formed as a static framework for a company's operations, but rather as a management system that combines leadership, innovation, knowledge, adaptability and competitiveness. The study noted that 86% of employers expect artificial intelligence and data processing to have a transformative impact on business, 39% of existing skills are changing or becoming obsolete, and 63% of employers identify the skills gap as the main barrier to transformation. It was also shown that 42% of executives consider the company's current model to be unsustainable in the long term without a change of course, confirming the need for managerial renewal of business models. The results can be used by business leaders, development managers, strategic management specialists and business owners to review business models, enhance managerial adaptability and improve the competitiveness of the enterprise

Keywords: organisational adaptability; business competitiveness; dynamic capabilities; open innovation; management decisions

Introduction

Business operations are influenced by shifts in demand, technological advancements, competitive pressures, and requirements regarding environmental and social responsibility. In such circumstances, the sustainability of

Suggested Citation:
Pavlenchyk, N., & Tsizdyn, V. (2026). Role of leadership and creative management in shaping sustainable business models. *Economic Forum*, 16(2), 38-51. doi: 10.62763/ef/2.2026.38.

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a business model depends on the organisation's ability to adapt its value proposition, organisational processes, resource base, and methods of engaging with customers in line with changes in the economic environment. Leadership provides strategic direction for these changes, coordinates management decisions, develops knowledge and supports staff innovation. Creative management performs an applied function: it facilitates the search for new solutions in the areas of products, services, business processes, distribution channels, partnerships and value creation. In this combination, leadership determines the direction of business model transformation, whilst creative management ensures its practical implementation and enhances the enterprise's competitiveness.

Studies from 2021 to 2026 address the interrelationship between leadership, innovation, sustainable development and the transformation of business models. H.I. Duh *et al.* (2026) investigated the impact of sustainable business model innovations and green competencies on business sustainability in the extractive sector. The authors demonstrated that a company's sustainability is linked to a combination of an updated value proposition, green knowledge, skills, attitudes and creativity among employees, which is crucial for analysis of managerial dimension of sustainable business models. The leadership competencies required to combine innovation and sustainable development were examined by M. Portuguez-Castro & I.M. Castillo Martínez (2025). The study emphasised that preparing managers for the modern business context requires the development of competencies that ensure organisations' ability to create innovative solutions following sustainability principles. M. Bashir & S. Pradhan (2023) investigated the impact of knowledge-oriented leadership on business model innovation and open innovation. The study highlighted the relevance of an enterprise's absorptive capacity, i.e. the ability to perceive, assimilate and utilise external knowledge to update the business model.

M. Bashir *et al.* (2022) developed and validated a scale for assessing innovations in sustainable business models. The researchers identified components such as innovation in the sustainable value proposition, innovation in value creation and delivery, and innovation in value capture, which specified the structure of a sustainable business model. A framework approach to business model innovation for sustainability was proposed by R. Ferlito & R. Faraci (2022). The study found that innovation in a sustainable business model involves changing the way an enterprise operates to reduce negative impacts on society and the environment and to develop new ways of creating value. The relationship between leadership styles, employee creativity and organisational innovation was investigated by N.T. Nguyen *et al.* (2021). The researchers found that transformational leadership is positively associated with employee creativity and organisational innovation, whereas transactional leadership has a different nature of influence on these processes. Digital innovation of a sustainable business model from the perspective of dynamic capabilities was analysed by N. Hajiheydari *et al.* (2023). The researchers argued that an enterprise requires the ability to adapt internal competencies and processes in line with digital transformations and external changes.

The Ukrainian academic context for research into this topic is defined by studies on creative management and the transformation of business models. V.V. Tomakh *et al.* (2023) demonstrated that creative management is not a supporting element of management, but a factor in a company's competitiveness, as it influences innovation, adaptability and the ability to respond quickly to changes in the market environment. V. Levytskyi (2024) examined creative management as a set of practices, strategies and models that ensure the development of creative thinking, support for innovation and the management of strategic changes within an enterprise. V. Havran *et al.* (2025) specified the Ukrainian context of business model transformation using the examples of Rozetka, Prom.ua and Nova Poshta. The study demonstrated that Rozetka expanded its business model from the sale of electronics to an e-commerce platform, Prom.ua provided digital infrastructure for small and medium-sized businesses, and Nova Poshta strengthened its logistics model through automated tracking and delivery optimisation. These examples confirm the importance of digital technologies, customer focus and operational flexibility for the renewal of business models.

The data from the analysed sources indicate that the studies provide a comprehensive overview of specific aspects of sustainable business models, green innovation, digital transformation, leadership competencies and employee creativity. At the same time, the integrated managerial link between leadership, creative management, business model adaptability and the enhancement of enterprise competitiveness remains insufficiently specified. This relationship requires further analysis within the field of management, as the sustainability of a business model is shaped not only by the implementation of innovations, but also by the management system's ability to transform new ideas, knowledge and market signals into practical solutions. Therefore, the study aimed to determine how leadership and creative management influence the formation of sustainable business models and ensure their adaptation to changes in the economic environment and the maintenance of competitiveness. To achieve this aim, the following research objectives were identified: to explore the managerial significance of leadership as a factor in strategic direction, organisational adaptability and the development of a sustainable business model for an enterprise; to determine the role of creative management in updating the value proposition, business processes, partnerships and mechanisms for creating competitive advantages; to substantiate the interrelationship

between leadership, creative management, the sustainability of the business model and the enterprise's competitiveness in a changing economic environment.

Materials and Methods

The study was conducted as a theoretical and analytical investigation, as it aimed to summarise contemporary approaches to interpretation of the role of leadership and creative management in shaping a sustainable business model for an enterprise. This structure corresponded to the content of the results, which combined an analysis of academic papers and analytical reports, a comparison of management approaches, and the construction of an integrative model of the influence of leadership and creative management on the sustainability of a business model. The research source base was compiled according to thematic, temporal and typological criteria. The analysis included scientific articles, systematic reviews, empirical studies, theoretical and conceptual works, and international analytical reports that addressed issues of leadership, creative management, business model innovation, organisational adaptability, dynamic capabilities, open innovation, digital transformation and business competitiveness. The main publication period covered 2020-2026, which addressed contemporary approaches to managing sustainable business models. To illustrate the theoretical propositions, the study utilised examples of business model transformations, specifically including Rozetka, Prom.ua and Nova Poshta as enterprises whose activities are linked to the digitalisation of business processes, the development of platform-based interaction, logistical optimisation, the expansion of communication channels with consumers and the renewal of the value proposition. These enterprises were not regarded as subjects of independent empirical case studies, but rather as illustrative examples of the practical application of business model adaptability, creative management and managerial coordination of change.

The method of theoretical analysis was used to clarify the meaning of the key concepts of the study: "sustainable business model", "sustainable leadership", "creative management", "dynamic capabilities", "organisational adaptability" and "enterprise competitiveness". The role of creative management was analysed by identifying its managerial functions within the structure of a sustainable business model: generating new ideas, updating the value proposition, restructuring business processes, developing partnerships, utilising external knowledge, and transforming innovative solutions into sources of competitive advantage. To explore the concept of sustainable leadership and its link to sustainable entrepreneurial behaviour, the systematic review by G.K. Ribeiro & J. Leitão (2024) was utilised. The study by M. Coffay *et al.* (2024) was used to explain the link between innovations in sustainable business models, dynamic capabilities and organisational design. To clarify the role of dynamic capabilities in ensuring the organisational sustainability of small and medium-sized enterprises, the study by V. García-Valenzuela *et al.* (2024) was used. The impact of knowledge-oriented leadership on organisational sustainability in crisis conditions was analysed based on the study by N. Oo & S. Rakthin (2025). The role of open innovation in enhancing organisational adaptability and sustainable development of enterprises was examined in the work by K. Saemaldaher & O.L. Emeagwali (2025). The mechanism by which dynamic capabilities and leadership style influence the sustainability of a business model in an enterprise's interaction with users was clarified based on the study by H. Zhang *et al.* (2025).

A secondary analysis method was used to characterise the external management environment, which drives the need to update companies' business models. International reports were considered not as evidence of a direct impact of leadership on the business model, but as a source of data on factors relating to digital, human resources, innovation, macroeconomic and risk transformation. Indicators of the impact of artificial intelligence on business, changes in professional skills, skills gaps, macroeconomic and inflationary risks, cyber risks, shortages of workers with the required skills, geopolitical threats, the viability of current business models, innovation priorities and the innovation readiness of enterprises. To determine the impact of digitalisation, artificial intelligence and changes in professional skills, The Future of Jobs Report 2025 (World Economic Forum, 2025) was used. PwC's (2025) 28th Annual Global CEO Survey was used to characterise macroeconomic, inflationary, cyber, human resources and geopolitical risks. To analyse the gap between the priority of innovation and companies' actual readiness to implement it, analytical material from the Boston Consulting Group (2024) on the innovation readiness of enterprises was used. To assess the long-term factors of innovation performance, the Boston Consulting Group's (2025) analytical material on twenty years of innovation competition trends was utilised. The State of Organisations 2023 report (Guggenberger *et al.*, 2023) was used to characterise organisational shifts, management complexity and the need for leadership development.

A comparative analysis was used to compare six academic approaches to explaining the sustainability of a company's business model: the dynamic capabilities and organisational design approach, the innovation-oriented approach, the knowledge-oriented leadership approach, the open innovation interaction approach, the consumer-oriented approach, and the creative management approach. The dynamic capabilities and organisational design approach explain the sustainability of a business model through an enterprise's ability to reconfigure resources, processes and organisational structure in response to changes in the environment. The innovation-oriented approach focuses on an enterprise's ability to create new products, processes and ways of

generating value. The knowledge-oriented leadership approach views leadership as a factor in organisational learning, knowledge sharing and the promotion of innovative behaviour among employees. The open innovation approach links the sustainability of a business model to the incorporation of external knowledge, partnerships and engagement with stakeholders. The consumer-oriented approach explains business model renewal through user feedback, analysis of their needs and the incorporation of consumer experience into management decisions. The creative management approach defines business model sustainability through the generation, selection and implementation of new management, product, process and partnership solutions.

A systematisation method was used to group external factors influencing the development of a sustainable business model for the enterprise. As part of this method, data was summarised on digitalisation, the spread of artificial intelligence, changes in professional skills, skills gaps among employees, macroeconomic instability, inflationary risks, cyber threats, a shortage of skilled personnel, geopolitical conflicts, the need to redefine business models, the level of innovation priority, innovation readiness and the long-term innovation performance of companies. The systematised data was used to construct summary tables regarding the external factors of business model transformation, their managerial implications, and the impact of leadership and creative management on the components of a company's competitiveness.

Methods of synthesis and generalisation were employed to integrate the results of theoretical analysis, content analysis, secondary analysis of international reports, comparative analysis and systematisation. Synthesis combined provisions on leadership, creative management, dynamic capabilities, open innovative interaction, organisational adaptability and competitiveness into a single explanatory framework. The generalisation was used to formulate conclusions regarding how the combination of leadership and creative management factors ensures the renewal, adaptability and sustainability of an enterprise's business model. The method of conceptual modelling was applied to construct an integrative model of the influence of leadership and creative management on a sustainable business model. Within the model, leadership was viewed as a factor in strategic direction, knowledge development, resource coordination and support for organisational adaptability. Creative management was viewed as a mechanism for renewing the value proposition, processes, partnerships, innovative solutions and methods of creating competitive value. These methods were used to form a research logic: from the theoretical clarification of concepts and content analysis of academic sources – to a secondary analysis of analytical reports, the systematisation of factors in business model transformation, and the development of an integrated model of the influence of leadership and creative management on the sustainability, adaptability and competitiveness of an enterprise.

Results and Discussion

A sustainable business model is shaped not only by changes in the product, technology or sales market, but also by the management system's ability to continually align the value proposition, resources, organisational structure, customer interactions and sources of economic performance. Within this approach, the resilience of a business model should be viewed as the result of managerial coordination between the company's strategic objectives and its ability to adapt internal processes in response to external challenges. If a business model lacks a mechanism for regularly reviewing resources, competencies, partnerships and value creation channels, it gradually loses its adaptability even in the presence of a competitive product or technological advantage. Therefore, leadership in this logic is not a separate management function, but a mechanism of strategic direction that determines the priorities for change, allocates responsibility, supports organisational learning and ensures the transition from a general idea of renewal to practical management decisions.

Three levels of leadership's impact on the sustainability of a business model can be identified. At the strategic level, leadership determines which external changes are critical for the organisation and require a review of the business model. At the organisational level, it ensures the alignment of resources, competencies, management structure and internal processes. At the operational level, leadership influences employees' ability to embrace change, participate in innovative decision-making, and apply knowledge to update products, services, or ways of interacting with consumers. It is the combination of these levels that can interpret leadership as the foundation of a business model's managerial adaptability. This approach is consistent with research in which sustainable leadership is viewed as a factor that supports responsible entrepreneurial practices, innovative solutions and the creation of economic and social value (Ribeiro & Leitão, 2024). This conclusion also aligns with the findings of N.M. Bocken & T.H. Geradts (2020), who established that innovations in sustainable business models within large corporations depend on organisational design and dynamic capabilities. The authors identified barriers and drivers of such innovations at the institutional, strategic and operational levels, which highlights the role of leadership as a factor in aligning external requirements, strategic decisions and day-to-day management practices. Therefore, sustainability of a business model is not determined solely by stated strategy but requires management decisions to be translated into organisational rules, procedures, the allocation of responsibilities and practices for the use of resources.

An analysis of the Ukrainian companies Rozetka, Prom.ua and Nova Poshta identified how leadership and creative management influence the transformation of business models in practice. In the case of Rozetka, the value proposition was expanded from the sale of individual product categories to a multi-category online hypermarket and marketplace model, combining a wide range of products, digital interaction with consumers and opportunities for external sellers. The role of creative management was evident in the shift in the management approach from traditional retail logic to a platform model, within which value is created not only through the sale of goods but also through the organisation of digital infrastructure, service interaction and the partnership-based participation of sellers. Adaptation to changes in the economic environment was achieved through the expansion of online sales channels, flexible updating of the product range and a focus on changing consumer behaviour in the context of digitalisation. The competitive advantages of this model were scalability, the breadth of the value proposition, the convenience of digital access for consumers, and the ability to respond quickly to changes in demand (Havran *et al*., 2025).

In the case of Prom.ua, the value proposition includes the creation of a digital environment for interaction between sellers and buyers, which is relevant for small and medium-sized businesses. Creative management in this business model was demonstrated through the transition from individual online sales tools to a comprehensive marketplace infrastructure that combines product listing, customer communication, digital promotion and the organisation of business activities in the online environment. Adaptation to changes in the economic environment took place through support for businesses requiring a rapid entry into e-commerce, the lowering of barriers to access digital sales channels, and the expansion of opportunities for online sales. Through a combination of leadership coordination and creative management, Prom.ua has established competitive advantages in the form of network effects, a broad base of sellers, the availability of digital tools for business, and the ability to sustain entrepreneurial activity in changing market conditions (Havran *et al*., 2025).

Nova Poshta's value proposition is based on fast, convenient and technologically supported delivery, combining a network of branches, parcel lockers, door-to-door delivery, digital tracking and international logistics services. Creative management was demonstrated by a shift in the management approach from a traditional logistics model to a service-digital model, in which competitive value is created through the automation of operations, route optimisation, the development of digital channels for customer interaction, and the continuous updating of the service offering. Adaptation to changes in the economic environment was achieved through the scaling of the logistics network, increased service speed, the development of international operations, and the ability to maintain delivery continuity amid high market volatility. Competitive advantages included speed, operational flexibility, digital transparency of logistics processes, consumer trust, and the ability to combine physical infrastructure with digital services (Havran *et al*., 2025).

The results of the content analysis of academic sources highlighted six recurring thematic categories that explain the managerial mechanism for developing a sustainable business model. The category of "knowledge-oriented leadership" was elaborated based on the study by M. Bashir & S. Pradhan (2023), where leadership is linked to the organisation of learning, knowledge sharing, absorptive capacity, and support for employees' innovative behaviour. The category "open innovation interaction" was specified based on the research by K. Saemaldaher & O.L. Emeagwali (2025), which emphasises the significance of external knowledge, partnerships and interaction with stakeholders for enhancing the enterprise's adaptability. The category "enterprise interaction with consumers" was substantiated in the study by H. Zhang *et al.* (2025), where user feedback is viewed as a source for updating the value proposition and developing the enterprise's dynamic capabilities. The category "dynamic capabilities" was elaborated based on the study by M. Coffay *et al.* (2024), in which the sustainability of a business model is linked to the enterprise's ability to reconfigure resources, competencies, processes and organisational design in response to changes in the environment. The category of "organisational adaptability" was refined based on a study by V. García-Valenzuela *et al.* (2024), where the adaptability of an enterprise is viewed as a prerequisite for maintaining organisational stability in a turbulent environment. The category of "innovative quality" was explored based on a study by N. Oo & S. Rakthin (2025), in which innovation is interpreted not merely as the generation of ideas, but as their translation into practical managerial, product and process solutions. A synthesis of these categories revealed that the sustainability of a business model is shaped not by a single factor, but by a combination of knowledge leadership, open innovation interaction, customer orientation, dynamic capabilities, organisational adaptability, innovative quality and creative managerial renewal.

To conduct a comparative analysis, academic approaches to explaining the sustainability of a business model were compared using a set of common criteria: the key factor of sustainability, the role of leadership, the significance of innovation and creative management, the mechanism of organisational adaptation, and the source of competitive advantages. This comparison avoids the need to summarise individual sources and highlights which managerial factors are most frequently associated with the development of a sustainable business model for an enterprise (Table 1)

Table 1. *A comparison of academic approaches to explaining the sustainability of a company's business model*

Key factor in the sustainability of a business model	Role of leadership	Role of innovation/ creative management	Adaptation mechanism	Competitive advantages	Nature of interaction with the external environment
Dynamic capabilities and organisational design	Leadership ensures the alignment of strategic decisions, resources and organisational structure	Innovations in a sustainable business model depend on a company's ability to adapt its organisational processes	Redesigning organisational structures, developing dynamic capabilities and overcoming internal barriers	Flexible management, rapid reallocation of resources, and the ability to maintain stability in the context of change	Active response to changes in the market, technology, regulatory requirements and the competitive environment
Organisation's capacity for innovation	Leadership creates the conditions for utilising resources and maintaining organisational resilience	Innovative capacity is one of the key factors in a company's sustainability	Adaptation through the development of innovative capabilities, the reallocation of resources and responding to changes in the environment	Development of new products, processes and solutions that strengthen the company's market position	Priority of technological change, new consumer needs and evolving market opportunities
Knowledge-driven leadership and the quality of innovation	Leadership facilitates training, knowledge sharing, the review of outdated approaches, and the promotion of innovative behaviour	Innovative quality facilitates the transition from knowledge to practical solutions	Adaptation through knowledge management, organisational learning and the rejection of outdated management assumptions	Improvement of the quality of management decisions, development of staff competencies, and enhancement of innovation performance	Selective incorporation of external knowledge, professional expertise, market information and feedback
Open innovation and organisational adaptability	Leadership sets the rules for drawing on external expertise and coordinating partnerships.	Open innovation broadens access to ideas, technologies, partnership solutions and external expertise.	Adaptation through the breadth and depth of open innovation collaboration and the integration of external knowledge	Expansion of innovative potential, reduction of reliance on internal resources, acceleration of business model renewal	Cooperation with partners, suppliers, customers, professional bodies and other stakeholders
The company's interaction with customers, its adaptability and leadership style	Leadership strengthens the connection between user engagement and the development of dynamic capabilities	Innovative improvements are formed through customer feedback	Adaptation through the constant alignment of management decisions with user needs	Improvement of alignment of value proposition with market needs, strengthening of customer loyalty	Constant feedback from customers, analysis of their needs, and incorporation of user experience into business model updates
Creative management as a factor in competitiveness and strategic change	Leadership ensures that creative solutions are aligned with the company's development objectives	Creative management supports generation, selection and implementation of new management, product and process solutions	Adaptation through the development of creative thinking, a culture of innovation, strategic change and practical overhaul of the business model	Development of non-standard solutions, strengthening the company's competitive edge, and creating new sources of value	Flexible engagement with the market, partners and consumers through the exploration of new product formats, services and business processes

Source: *compiled based on V.V. Tomakh et al. (2023), M. Coffay et al. (2024), V.M. García-Valenzuela et al. (2024), N. Oo & S. Rakthin (2025), K. Saemaldaher & O.L. Emeagwali (2025), H. Zhang et al. (2025)*

A comparison of these approaches shows that the sustainability of a company's business model is not determined by a single factor, but rather by a combination of dynamic capabilities, knowledge-oriented leadership, open innovation collaboration, customer focus and creative management. Common to the analysed approaches is the perception of a sustainable business model as a system capable not only of responding to external changes, but also of transforming knowledge, innovation, partnerships and management decisions into sources of competitive advantage.

The external environment is highlighting the importance of precisely this type of leadership. According to the World Economic Forum (2025), by 2030 digital access, artificial intelligence, automation, rising living costs, economic slowdown, climate adaptation and geo-economic fragmentation will transform the structure of employment, professional skills and

business processes. The same report notes that 39% of existing employee skills will change or become obsolete between 2025 and 2030, whilst 63% of employers identify the skills gap as the main barrier to business transformation. Table 2 summarises the external factors that drive the need for sustainable business models and are reshaping the role of leadership in business management.

Table 2. *External factors influencing the transformation of business models and the managerial implications for organisation*

External factor	Confirmed figure/trend	Management implications for business model
Digitalisation and spread of artificial intelligence	86% of employers expect artificial intelligence and data processing to transform business by 2030	Requirement to review processes, staff competencies, and methods of creating and delivering value
Changes in staff skills	39% of skills will change or become obsolete between 2025 and 2030	Strengthening the role of leaders in training, upskilling and knowledge management
Skills gap	63% of employers identify it as the main barrier to transformation	Business model requires a built-in mechanism for developing human capital
Macroeconomic instability	29% of company executives in a global PwC survey cite it as a threat of significant financial losses	Scenario planning, flexible cost management and a review of revenue streams are required
Inflation	27% of managers identify inflation as a threat of financial loss	Relevance of price flexibility, operational efficiency and review of supply chains is growing
Cyber risks	24% of executives identify cyber risks as a threat	Robust business model incorporates digital security as a key component of operational continuity
Shortage of staff with necessary skills	23% of managers identify this factor as a threat	Competitiveness depends on staff development and knowledge acquisition
Geopolitical conflicts	22% of managers regard this factor as a threat	Businesses need to diversify their markets, suppliers and partnerships
Technological market disruptions	20% of managers identify this factor as a threat	Leadership must ensure that products, services and processes are updated promptly
Requirement to redefine business models	42% of executives believe that the company will not be viable for more than 10 years unless it changes its current course	Sustainability of a business model is directly linked to management's ability to adapt

Source: *generalised based on World Economic Forum (2025) and PwC (2025)*

The indicators presented in Table 2 do not directly measure the impact of leadership on business performance; however, they highlight the conditions under which strategic leadership, organisational learning, competence development, business process adaptation and creative change management become increasingly relevant. The results indicate that the sustainability of a business model is formed as a managerial attribute rather than a one-off strategic change. Whilst a traditional business model focuses primarily on generating current profits, a sustainable business model encompasses the ability to review the resource base, update competencies, maintain consumer trust, ensure operational continuity, and adapt to technological and market changes. In such a structure, leadership serves to integrate strategic vision, organisational culture, knowledge and change management practices. A comparison of the results obtained with the approach of K. Manninen *et al.* (2023) shows that a sustainable business model should be viewed as a mechanism for creating long-term value, combining economic, social, environmental and managerial outcomes. The authors identified five elements of sustainable value creation: forms of value, stakeholders, the temporal dimension, the spatial dimension, as well as tensions and conflicts arising in the process of reconciling the various objectives of the business model.

Creative management in the development of a sustainable business model serves a structural rather than a decorative function. It consists of an organisation's ability to create new combinations of resources, knowledge, technologies, partnerships and channels of interaction with consumers. In this context, managerial creativity manifests itself not only in the generation of ideas, but in the transformation of ideas into replicable management decisions that change the way value is created, delivered and received. Research into innovation resilience confirms that companies with a greater capacity for systematic innovation demonstrate a better ability to respond to crises. A report by the Boston Consulting Group (2025) summarised the results of a twenty-year analysis of the ranking of the 50 most innovative companies for the period 2005-2023. Companies that consistently maintained high positions in innovation rankings had higher total shareholder returns and, on average, outperformed the broader market by 2.4 percentage points each year. The report also notes that between 2005 and 2023, 178 unique companies appeared in the BCG rankings, but only 14% of them were "serial innovators", meaning they appeared in the ranking ten or more times. The companies that appeared most frequently in the BCG rankings during this period include Google, IBM, Samsung, Amazon, Apple and Microsoft. This suggests that innovative resilience is determined

not only by the level of expenditure on research and development, but also by a company's ability to invest systematically in digital capabilities, managerial competencies, decision-making speed and the commercialisation of new solutions.

Creative management ensures the sustainability of a business model through three interrelated areas. The first area involves updating the value proposition, whereby a company adapts its product or service to new consumer needs, changes in purchasing power, digital channels, and demands for environmental or social responsibility. The second area involves the restructuring of internal processes, specifically the reduction of redundant operations, the use of digital tools, the acceleration of decision-making, and the minimisation of resource wastage. The third area concerns the development of partnership models, in which the company utilises the expertise of suppliers, consumers, research institutions, professional communities, and digital platforms. This finding is substantiated by the conclusions of L.C. Comin *et al.* (2020), who established that sustainable business models rely on the direct participation of stakeholders, particularly users, in the creation of sustainable value. In the practices analysed by the authors, the sustainability of business models was linked to technological solutions, clean energy, the efficient use of materials and energy, repair and maintenance rather than planned obsolescence, the reuse of waste, service formats and networked collaboration. Consequently, within the scope of the topic under investigation, creative management should be interpreted as a system of managerial actions aimed not only at generating new ideas, but also at changing the way users, resources, technologies and partners are engaged in the value creation process.

The relevance of creative management is particularly evident in situations where innovation is recognised as a priority, but organisational readiness to implement it remains limited. According to BCG, 83% of executives identify innovation as one of their companies' top three priorities, yet only 3% of firms will meet the innovation readiness benchmark by 2024; over half of executives cite an unclear strategy as one of the top three challenges for innovation teams (Boston Consulting Group, 2024). These figures highlight a management gap between the declared priority of innovation and the actual organisational readiness to implement innovations. This gap shows that creativity and the presence of new ideas do not ensure the sustainability of a business model if they are not linked to strategy, resource allocation, the distribution of responsibilities, performance indicators, and the company's ability to consistently implement changes. This is precisely why creative management in a sustainable business model acts as a transformer: it translates non-standard solutions from the level of proposals to the level of organisational practices. This conclusion is consistent with the findings of M.P. Pieroni *et al.* (2019), who, based on a systematic review, identified 94 publications and 92 approaches to business model innovation for the circular economy and sustainability. The authors identified the fragmented nature of existing approaches and a lack of comprehensive solutions covering several stages of the innovation process. This clarifies the conclusion reached: creative management should not be limited to the initial generation of ideas, but should ensure a seamless transition from identifying opportunities to designing, implementing, evaluating and refining changes to the business model.

By synthesising contemporary approaches, an integrated model of the impact of leadership and creative management on the sustainability of a business model has been developed. Its essence lies in the fact that leadership sets the strategic direction and ensures managerial coherence, whilst creative management develops tools for updating processes, products, organisational structure and interaction with the external environment. A sustainable business model emerges at the intersection of these two components. In the academic literature, this link is confirmed through the concept of an organisation's dynamic capabilities. M. Coffay *et al.* (2024) demonstrated the interrelationship between innovations in sustainable business models, dynamic capabilities and organisational structure. The study emphasised that barriers and drivers at the organisational level can both facilitate and hinder the development of dynamic capabilities for the continuous renewal of the business model. Table 3 combines the results of theoretical analysis, a comparison of scientific approaches and a systematisation of managerial factors. In the model, leadership is viewed as a framework for strategic direction and coordination of change, whilst creative management is viewed as a framework for the practical renewal of products, processes, partnerships and value creation methods.

Table 3. *Integrative model of the impact of leadership and creative management on a sustainable business model*

Influence component	Management contents	Changed business model element	Sustainability result
Strategic leadership	Establishment of direction of development, priorities and acceptable levels of risk	Value proposition, target markets, revenue streams	Business model is set to undergo a revamp
Knowledge-based leadership	Promotion of knowledge sharing, training, upskilling and analytical decision-making	Staff competencies, knowledge management, organisational memory	Company identifies changes more quickly and responds to them

Table 3, Continued

Influence component	Management contents	Changed business model element	Sustainability result
Creative management	Generation, selection and implementation of creative management, product and process solutions; fostering a culture of innovation and strategic change	Products, services, processes, distribution channels, organisational practices	Company is creating new value propositions and improving adaptability of its business model.
Open innovation collaboration	Incorporation of external expertise from customers, partners, suppliers, and academic and professional communities	Partnership network, innovation process, value chain	Business model reduces dependence on internal resource constraints
Organisational adaptability	Flexible reallocation of resources, changes in roles, and process reorganisation	Organisational structure, operating model, costs	Company maintains functionality despite the changes
Competitiveness management	Balancing innovation, costs, quality, responsiveness and customer value	Market position, customer relations, performance indicators	Business model maintains a competitive position

Source: *compiled based on V.V. Tomakh et al. (2023), V. Levytskyi (2024), G.K. Ribeiro & J. Leitão (2024), M. Coffay et al. (2024), H. Zhang et al. (2025), K. Saemaldaher & O.L. Emeagwali (2025), N. Oo & S. Rakthin (2025)*

The model developed shows that the sustainability of a business model depends on a sequence of managerial actions. At the first level, leadership provides a strategic vision and determines which changes in the external environment are significant for the organisation. At the second level, creative management ensures the development of alternative solutions regarding products, processes, partnerships and resources. At the third level, organisational adaptability puts these solutions into practice. At the fourth level, competitiveness is manifested through the enterprise's ability to maintain or strengthen its market position without losing operational stability. The resulting integration model can be refined using the findings of F. Cosenz *et al.* (2020), who proposed dynamic business modelling for sustainability based on a combination of an adapted sustainable business model canvas and system dynamics. The authors demonstrated that environmental, social and economic factors of value creation should be considered as a cause-and-effect structure of feedback loops. Within the scope of this article, this approach confirms that leadership and creative management shape a sustainable business model not linearly, but through the interaction of strategic decisions, resource constraints, consumer demand, organisational competencies and the outcomes of competitive behaviour. Data from H. Zhang *et al.* (2025) clarify this mechanism through the interaction between the enterprise and consumers. The authors established that more frequent interaction between a firm and its users is associated with greater business model sustainability, and that dynamic capabilities act as a mediator between this interaction and sustainability. Furthermore, knowledge-oriented leadership strengthens the link between user interaction and dynamic capabilities. This finding demonstrates that a resilient business model is shaped not only by internal managerial will, but also by the constant alignment of managerial decisions with consumer needs. Leadership ensures the ability to hear external signals, whilst creative management transforms these signals into a new configuration of value.

The adaptability of a business model depends on the quality of the knowledge utilised in management. Knowledge-oriented leadership ensures not only the accumulation of information, but also its transformation into management decisions. A study by N. Oo & S. Rakthin (2025), based on data from 213 small and medium-sized enterprises in Thailand, shows that knowledge-oriented leadership influences enterprises' ability to overcome crises and adapt, whilst the quality of innovation is a mediating element in shaping the ability to anticipate. The importance of organisational "unlearning" – that is, discarding outdated knowledge – to enhance adaptability is also emphasised. For sustainable business models, this means that the accumulation of experience does not always ensure competitiveness. If knowledge is not reviewed, a firm may replicate outdated solutions that do not correspond to new market conditions. Therefore, an effective business model requires not only learning but also a mechanism for regularly reviewing managerial assumptions, technological solutions, consumer segments and revenue streams. Research by V. García-Valenzuela *et al.* (2024), using the example of small and medium-sized commercial enterprises in Mexico, confirms that dynamic capabilities have a positive impact on organisational resilience, and that innovative capacity proves to be the most influential factor among the capabilities analysed. This can define creative management as a practical manifestation of an enterprise's dynamic capabilities, aimed at updating the business model in a turbulent environment.

Within the framework of a sustainable business model, knowledge fulfils three functions. The first function is diagnostic: knowledge identifies changes in the environment before they escalate into a crisis. The second function is design-oriented: knowledge is used to create new solutions in products, services, processes and partnerships. The third function is corrective: knowledge can be used to revise decisions following feedback from consumers, employees, partners and the market (Pavlenchyk *et al*., 2023). The findings also show that creative

management becomes more effective when a company is not limited to internal sources of ideas. Open innovation collaboration broadens access to knowledge, technologies, consumer experience and partner solutions. K. Saemaldaher & O.L. Emeagwali (2025) argue that the depth of open innovation interaction directly influences organisational resilience, whilst the breadth of such interaction influences resilience through organisational adaptability. The study also established that both components of open innovation interaction influence indicators of sustainable development in enterprises.

This finding highlights the role of creative management: it is not only responsible for internal idea generation, but also for managing the flow of external knowledge. A company establishes a sustainable business model when it can combine internal resources with external expertise. Such competencies include partners' technological solutions, consumer behavioural data, the expert knowledge of professional communities, suppliers' experience and practices within the competitive environment. At the same time, open innovative collaboration does not automatically ensure sustainability. Its outcome depends on whether the organisation can integrate external knowledge into internal processes. Therefore, the role of leadership lies in establishing the rules for such integration: defining partnership goals, allocating responsibilities, protecting data, evaluating results, and preventing the dispersion of resources. Without this, external ideas may remain unsystematised and fail to transform the business model. Thus, a company's competitiveness in an unstable economic environment is shaped by a combination of three outcomes: the adaptability of the business model, the efficiency of resource management, and the ability to create distinctive consumer value. Leadership ensures the strategic alignment of these outcomes, whilst creative management develops the tools to achieve them. P. Guggenberger *et al.* (2023) note in their report on the state of organisations that businesses are simultaneously facing economic volatility, geopolitical instability, technological change and organisational challenges. According to the survey results, 50% of executives consider their organisations to be well-prepared to anticipate and respond to external shocks, whilst around 67% of executives assess their organisations as overly complex and inefficient. In this context, the need to develop talent and invest in leadership capable of driving the organisation forward is emphasised.

Competitiveness, therefore, is not simply a matter of price, quality or productivity taken in isolation. It arises from a company's managerial ability to ensure alignment between its strategy, people, processes, innovation and market offering. If the business model is not updated, the company loses its ability to respond to changes in consumer needs, technological standards and the cost of resources. If, however, the update takes place without leadership coordination, there is a risk of management efforts becoming fragmented (Table 4). The practical implications of this finding are evident in the study by M. Breier *et al.* (2021), who analysed six hospitality businesses in Austria during the COVID-19 crisis. The authors found that business model innovations were implemented during and after the crisis to generate new revenue streams and maintain liquidity, whilst regular customers served as a psychological and financial support for the enterprises. This finding substantiates the proposition regarding business model resilience: in crisis conditions, competitiveness is sustained not by a general readiness for change, but by the ability to rapidly restructure revenue streams, channels of interaction with consumers, and methods of maintaining cash flow.

Table 4. *The impact of leadership and creative management on the components of a company's competitiveness*

Key factor in competitiveness	Role of leadership	Role of creative management	Expected result for business model
Adaptability	Defines the strategic priorities for change	Offers alternative solutions for products, processes and communication channels	Business model responds more quickly to changes in the environment
Operational performance	Aligns resources, responsibilities and objectives	Streamlines unnecessary processes and modernises working methods	Corporate resource vulnerability is decreasing
Innovativeness	Supports a culture of knowledge and decision-making	Turns ideas into products, services or management practices	Creates new sources of value
Customer emphasis	Highlights strategic significance of feedback	Uses customer data to update its offering	Product or service is being better tailored to market needs
Resilience to risks	Defines response scenarios and acceptable risk limits	Develops flexible options for organising processes	Company ensures business continuity
Long-term value	Combines economic, social, human resources and technological objectives	Creates new ways of engaging with partners and the market	Business model retains its potential for growth

Source: *generalised based on T. Clauß et al. (2021), P. Guggenberger et al. (2023), K. Manninen et al. (2023), K. Saemaldaher & O.L. Emeagwali (2025)*

A synthesis of the findings provides grounds for defining a sustainable business model as one possessing five characteristics: the capacity for strategic renewal, the presence of a knowledge development mechanism,

openness to external innovation partnerships, organisational adaptability, and a link between innovation and competitive performance. Leadership ensures the direction of these characteristics, whilst creative management ensures their practical implementation. This conclusion is supported by the empirical findings of T. Clauß *et al.* (2021), who, based on data from 432 German companies in the electronics industry, established a positive link between strategic flexibility and business model innovation. The authors also showed that this relationship is strengthened under conditions of environmental turbulence, and that value proposition innovation and value creation are positively associated with firm performance. At the same time, value-capturing innovations were negatively correlated with performance, indicating the need for careful managerial alignment of new revenue mechanisms with consumer expectations and the company's capabilities. Based on the findings, a framework for developing a sustainable business model has been formulated, reflecting the interrelationship between leadership, innovation, knowledge, adaptability and competitive dimensions (Fig. 1).

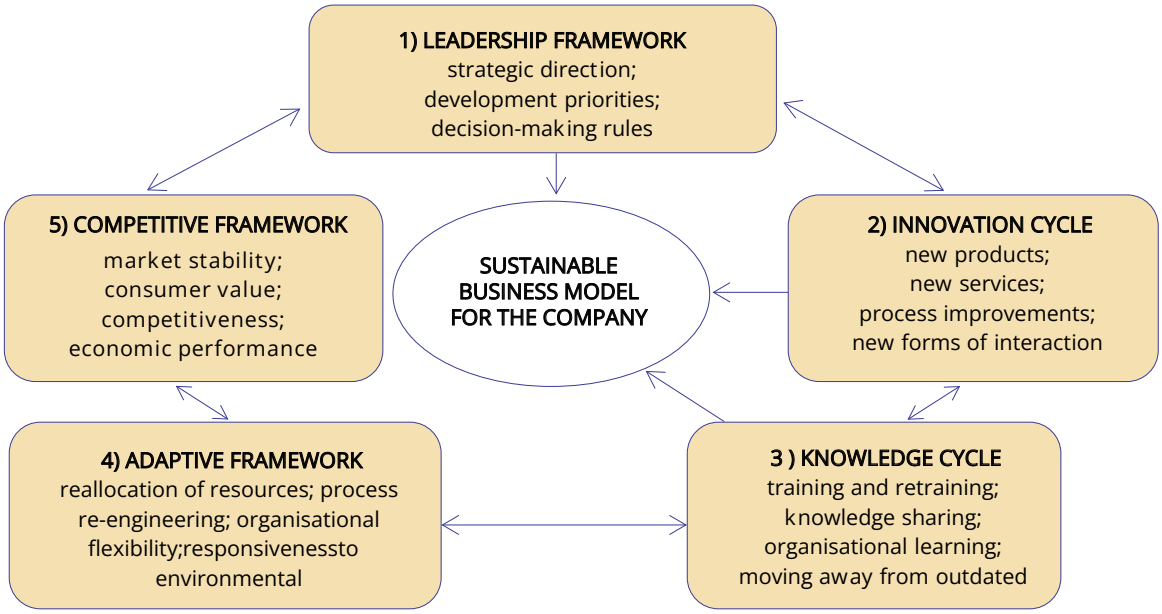

Figure 1. *Framework for developing a sustainable business model for an enterprise*
Source: *compiled based on T. Clauß et al. (2021), V.V. Tomakh et al. (2023), V. Levytskyi (2024), G.K. Ribeiro & J. Leitão (2024), M. Coffay et al. (2024), H. Zhang et al. (2025), K. Saemaldaher & O.L.Emeagwali (2025), N. Oo & S. Rakthin (2025)*

The significance of this framework is determined by the fact that it combines leadership and creative management not as separate managerial phenomena, but as complementary factors in the sustainability of a business model. Leadership without creative management sets a strategic direction, but does not always provide a sufficient number of practical solutions for innovation. Creative management without leadership generates ideas, but does not guarantee their alignment with the company's strategy, resources and competitive position. The combination of the two components shapes a company's ability to adapt in a changing economic environment. Further clarification of this framework is provided by the findings of M. Geissdoerfer *et al.* (2020), who systematised the concepts of the circular business model and circular business model innovation. The authors identified four strategies for circular business models – closing, slowing down, intensifying and dematerialising resource flows – and demonstrated that these strategies influence the value proposition, the creation and delivery of value, and the capture of value. Within the scope of the research topic, this implies that a sustainable business model must encompass not only managerial adaptability but also a concrete restructuring of resource flows, operational processes, and methods of generating economic outcomes. Thus, the results demonstrate that leadership shapes the managerial foundation of a sustainable business model through strategic direction, knowledge development, support for change and resource coordination. Creative management ensures a substantive renewal of the business model through new solutions, open and innovative collaboration, process flexibility, and the transformation of external changes into sources of competitive advantage. In this context, a sustainable business model is not a static framework for a company's operations, but a constantly evolving management system capable of maintaining economic performance, adaptability and competitiveness.

Conclusions

The study found that leadership and creative management form distinct yet complementary dimensions of a

sustainable business model. Leadership provides the strategic, coordination and knowledge dimensions, as it determines the direction of development, coordinates resources, supports organisational change, the development of competencies and the making of management decisions in line with the enterprise's long-term goals. Creative management forms the innovation and application dimension of the business model, linked to the renewal of the value proposition, business processes, partnerships, channels of interaction with consumers, and methods of creating competitive advantages.

A sustainable business model should be viewed as a dynamic management system in which strategic direction, knowledge management, innovation, organisational adaptability and competitive performance interact with one another. Under this approach, leadership sets the logic of change and ensures its coherence, whilst creative management transforms new ideas, external signals and internal resources into practical management, product and process decisions. The quantitative indicators examined in the study confirmed not a direct impact of leadership and creative management on enterprise performance, but the presence of external conditions that heighten the need for business model renewal. In particular, the transformative impact of artificial intelligence, changes in professional skills, a skills gap and managers' doubts regarding the long-term viability of current business models point to the need for the development of leadership, organisational learning, adaptation and creative management. A limitation of the study is its theoretical and analytical nature, as the conclusions are based on the generalisation of scientific approaches and secondary analysis of international reports, rather than on empirical measurement of a specific enterprise's activities. Further research should conduct an empirical verification of the proposed model in specific sectors, a comparison of enterprises of different sizes, and quantification of the impact of leadership practices and creative management on financial performance, innovation activity and market resilience.

Acknowledgements

None.

Funding

None.

Conflict of Interest

None.

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Роль лідерства та креативного менеджменту у формуванні стійких бізнес-моделей

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Анотація. Метою роботи було обґрунтувати управлінський механізм поєднання лідерства та креативного менеджменту в процесі оновлення бізнес-моделі підприємства, а також визначити, як ці чинники сприяють її адаптивності, інноваційності та конкурентоспроможності в умовах змінного економічного середовища. Дослідження було виконано як теоретико-аналітичне із застосуванням методів контент-аналізу наукових джерел, порівняльного аналізу, вторинного аналізу міжнародних аналітичних звітів, систематизації, синтезу, узагальнення та концептуального моделювання. На прикладі українських підприємств Rozetka, Prom.ua та «Nova Poshta» було показано, що оновлення стійких бізнес-моделей реалізується через платформізацію торгівлі, розвиток цифрової інфраструктури для малого й середнього бізнесу, логістичну оптимізацію, автоматизоване відстеження та розширення каналів взаємодії зі споживачами. Було встановлено, що лідерство формувало стратегічний контур стійкої бізнес-моделі через визначення напряму розвитку, координацію ресурсів, підтримку змін, управління знаннями та розвиток організаційної здатності до оновлення. Креативний менеджмент було визначено як механізм практичного оновлення ціннісної пропозиції, бізнес-процесів, партнерських зв'язків, каналів взаємодії зі споживачами та джерел створення цінності. Було виявлено, що стійка бізнес-модель формується не як статична схема діяльності підприємства, а як управлінська система, що поєднує лідерський, інноваційний, знаннєвий, адаптаційний і конкурентний контури. У дослідженні було враховано, що 86 % роботодавців очікують трансформаційного впливу штучного інтелекту й оброблення інформації на бізнес, 39 % наявних навичок змінюються або втрачають актуальність, а 63 % роботодавців визначають розрив у навичках як головний бар'єр трансформації. Також було показано, що 42 % керівників вважають поточну модель компанії нежиттєздатною в довгостроковій перспективі без зміни курсу, що підтвердило необхідність управлінського оновлення бізнес-моделей. Результати можуть бути використані керівниками підприємств, менеджерами з розвитку, фахівцями зі стратегічного управління та власниками бізнесу для перегляду бізнес-моделі, посилення управлінської адаптивності та підвищення конкурентоспроможності підприємства

Ключові слова: організаційна адаптивність; конкурентоспроможність підприємств; динамічні здібності; відкриті інновації; управлінські рішення

ECONOMIC FORUM
Journal homepage: https://e-forum.com.ua/en
Vol. 16, No. 2, 2026, 52-65
ISSN 2308-8559
e-ISSN 2415-8224
Article's History: Received: 17.01.2026 Revised: 13.04.2026 Accepted: 28.05.2026 Published: 25.06.2026

UDC 336.64:336.671.1:658.14/.15(477)
Doi: 10.62763/ef/2.2026.52

The impact of capital structure on the profitability of enterprises in the real sector of the economy

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Abstract. The purpose of this study was to determine the impact of capital structure on the profitability and financial stability of enterprises in the real sector of the economy of Ukraine. The study was based on an empirical comparative financial analysis, within which the methods of financial analysis, ratio analysis, comparative analysis and correlation analysis were applied to assess the relationship between capital structure and profitability indicators of enterprises. The results of the study showed that the debt-to-equity ratio of Private Joint Stock Company "Interpipe NTRP" decreased from 3.08 in 2022 to 0.83 in 2024, while equity increased from UAH 7.5 billion to UAH 27.2 billion, and net profit increased from UAH 9.2 billion to UAH 11.8 billion. For Joint Stock Company "Ukrzaliznytsia", an increase in the debt-to-equity ratio was established from 0.31 in 2023 to 0.65 in 2025 and the preservation of unprofitability, with the largest net loss of UAH 7.7 billion in 2025. Analysis of the Joint Stock Company "Construction Company "Ukrbud" showed that even with a high level of financial autonomy, the company remained unprofitable, while net loss increased to UAH 13.5 million in 2024. Correlation analysis confirmed a strong direct relationship between the Debt-to-Equity Ratio and Return on Equity at 0.96, as well as between the Debt-to-Equity Ratio and Return on Assets at 0.82. The results confirmed that moderate use of debt capital contributed to increasing the profitability of enterprises, however, the effectiveness of financial leverage depended on the level of operating profitability, financial costs and overall financial stability of enterprises. The practical significance of the study lies in the possibility of using the obtained results by enterprise managers, financial analysts and investors to optimise the ratio of equity and borrowed capital and improve financial stability under conditions of economic instability

Keywords: financial leverage; debt financing; equity ratio; return on assets; firm value; net loss

Introduction

Amid the transformation of the Ukrainian economy, financial market instability, rising credit costs, and stronger competition, forming an effective capital structure for enterprises in the real sector becomes especially important. The rational ratio of equity and debt capital is a key factor in ensuring financial stability, investment attractiveness, and long-term enterprise development. The formation of an effective capital structure is especially important under economic instability, as the ratio of equity and debt financing affects profitability, financial zstability, and enterprise efficiency. The study by O.O. Lemishko & A.M. Blazhevych (2022) examined the influence of management decisions on capital structure optimisation and its role in ensuring profitability. The authors found that effective capital management aims to form an optimal structure, while increasing the profitability of equity and total capital is a key indicator of management effectiveness. Theoretical approaches to capital structure formation and optimisation were studied by S.M. Didukh & T.S. Fedorova (2022), who summarised scientific interpretations of "capital," identified the features of equity and debt financing, and substantiated

Suggested Citation:
Levaieva, L. (2026). The impact of capital structure on the profitability of enterprises in the real sector of the economy. *Economic Forum*, 16(2), 52-65. doi: 10.62763/ef/2.2026.52.

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the importance of financial leverage for enterprise efficiency. The authors proved that capital structure affects profitability, financial stability, solvency, and enterprise value, while wartime conditions require reducing borrowed funds, optimising costs, and improving receivables and payables management.

In conditions of growing financial risks and economic instability, forming an optimal capital structure becomes an important element of enterprise financial strategy. Practical approaches to optimising financial resources were studied by N. Dubrova *et al.* (2025), who proved that the ratio of equity and debt capital directly affects profitability, financial stability, and solvency of enterprises. The authors also proposed a methodological approach to determining the optimal capital structure based on the "profitability-financial risk" criterion and found that the most effective ratio for the studied enterprise is 80% equity and 20% debt capital. The relationship between the real and financial sectors of the economy was investigated by V. Vydobora (2022), who substantiated that the financial sector transforms savings into investments, ensuring the flow of financial resources into the real sector. The author proved that enterprise efficiency depends on the balance between financial resources and production processes, while excessive dominance of the financial sector may lead to capital outflow from production, higher financial risks, and slower economic growth.

Amid military instability, limited access to long-term financial resources, and growing dependence on bank lending, the impact of liabilities structure on enterprise profitability becomes especially important. The relationship between bank lending and enterprise efficiency was studied by I.V. Zayukov (2024), who proved that the structure of attracted financial resources directly affects financial stability, liquidity, and profitability. The author found that increasing the share of short-term loans in current liabilities negatively affects profitability, while a 1% increase in short-term bank loans reduces the profitability of Ukrainian enterprises by 2.71%. Approaches to capital structure management were studied by N. Hrynyuk *et al.* (2023), who proposed a model for optimising corporate capital structure based on maximising return on equity (ROE) while considering the relationship between profitability and financial risk. The authors substantiated the use of financial leverage as a tool for managing financial resources and proved that the optimal combination of equity and debt capital increases both return on equity and corporate market value.

Under economic instability, rising borrowing costs, and stronger competition, enterprises require a capital structure that ensures profitability and financial stability. The impact of capital structure on financial leverage efficiency was studied by M. Slatvinska (2026), who argued that optimising the ratio of equity and debt capital is a strategic financial management tool. The author proved that balanced debt and equity financing increases return on equity, minimises weighted average cost of capital, and supports long-term financial stability. The study also found that Debt-to-Equity Ratio (D/E), ROE, and Weighted Average Cost of Capital (WACC) are key indicators of capital structure efficiency, while lower debt burden under rising interest rates improves profitability. The impact of sectoral determinants on enterprise financial decisions was studied by L. Shkvarchuk *et al.* (2026), who analysed the dependence of capital structure on profitability, operating cycle, accounts payable, and asset volume across sectors of the Ukrainian economy. Using multivariate regression analysis, the authors proved that asset volume and accounts payable are the key factors influencing capital structure formation. The study found that agricultural and mining enterprises rely more on internal financing, while transport and information enterprises depend more on accounts payable.

At the same time, further research is needed to determine the optimal capital structure of enterprises in Ukraine's real sector and assess the impact of financing sources on enterprise profitability under economic instability and military risks. The purpose of this study was to substantiate approaches to optimising the ratio of equity and debt capital in order to improve the profitability and financial stability of enterprises in the real sector of the economy of Ukraine. To achieve the goal, the following tasks were identified: to investigate theoretical approaches to the formation and management of the capital structure of enterprises; to analyse the impact of the ratio of equity and debt capital on the profitability, financial stability and efficiency of financial resource use of enterprises in the real sector of the economy of Ukraine.

Materials and Methods

The study was an empirical comparative financial and analytical study. The time frame of the study covered 2022-2025 since this period was characterised by a high level of economic instability, war risks, inflationary pressure, changes in the cost of credit resources and significant transformations in the financial activities of enterprises in the real sector of the economy of Ukraine, which made it possible to assess the peculiarities of the formation of the capital structure and its impact on the financial results of enterprises in crisis conditions. The use of this period was also due to the availability of complete official financial reports of enterprises after the start of full-scale military operations, which ensured the relevance and comparability of the study results. Preliminary financial reporting data for 2025 available in the public domain were additionally used for JSC "Ukrzaliznytsia" (n.d.) to trace recent changes in the enterprise's capital structure and financial results.

The methodological basis of the study was the generalisation method, which was used to study the theoretical foundations of the formation of the capital structure of enterprises, determine its main components

and assess the impact of the ratio of equity and debt capital on the financial results of enterprises in order to determine the features of the formation of an effective capital structure in modern economic conditions. The use of financial analysis made it possible to study the impact of financial leverage, debt load and financing structure on indicators of profitability, financial stability and efficiency of capital use of enterprises to substantiate directions for optimising the capital structure of enterprises in the real sector of the economy of Ukraine. Within the framework of the empirical analysis, three enterprises of the real sector of the economy of Ukraine were selected, representing the industrial, transport and construction sectors: PJSC "Interpipe NTRP" (n.d.), JSC "Ukrzaliznytsia" (n.d.) and JSC "Construction Company "Ukrbud" (n.d.). The choice of these enterprises was due to their belonging to different sectors of the economy, high capital intensity of activities, significant needs in financing long-term assets, as well as the availability of official financial statements in open access, which allowed for a comparative analysis of the capital structure and profitability indicators of enterprises in conditions of economic instability.

For PJSC "Interpipe NTRP", the consolidated financial statements for 2022-2024 were analysed Interpipe Holdings PLC (2022; 2023; 2024). The financial indicators of the enterprise were converted into thousands of hryvnias to ensure data comparability and unification of the analysis results. For JSC "Ukrzaliznytsia", separate financial statements for 2022-2025 were used: Joint Stock Company "Ukrainian Railways" (2022; 2023; 2024). Data for 2025 were included in the study due to their availability in the public domain for this enterprise Joint Stock Company "Ukrainian Railways" (2025). For JSC "Construction Company "Ukrbud", the consolidated financial statements for 2022-2024 were analysed JSC "Construction Company "Ukrbud" (2023; 2024). In the process of research using the financial analysis method, the following indicators were analysed: Total assets, Total equity, Total liabilities, Current liabilities, Revenue, Gross profit, Operating profit (loss), Net profit (loss), Cash and cash equivalents. The analysis of these indicators was carried out in order to assess the capital structure of enterprises, the level of financial stability, liquidity, debt burden and the effectiveness of operating activities of enterprises in the real sector of the economy. In addition, to assess the efficiency of the use of financial resources and the impact of capital structure on the profitability of enterprises, the following financial ratios were calculated:

$$\text{Debt-to-Equity Ratio} = \text{Total liabilities} - \text{Total equity}. \quad (1)$$

The indicator was calculated to assess the level of debt burden and the ratio of debt to equity of enterprises. Return on Assets (ROA) was calculated using the formula:

$$\text{ROA} = \text{Net profit} - \text{Total assets} \times 100\%, \quad (2)$$

where ROA – indicator characterising the efficiency of asset use; Net profit – financial result after taxation; Total assets – total value of enterprise assets. This was done to assess the efficiency of the company's asset use and ability to generate profit from available resources. Return on Equity (ROE) was calculated using the formula:

$$\text{ROE} = \text{Net profit} / \text{Total equity} \times 100\%, \quad (3)$$

where ROE – indicator reflecting the profitability of equity capital; Total equity – amount of equity capital. The calculation of the indicator was carried out in order to determine the efficiency of using equity capital and the level of profitability for the owners of the enterprise. Equity ratio was calculated using the formula:

$$\text{Equity ratio} = \text{Total equity} / \text{Total assets}. \quad (4)$$

Equity ratio – indicator reflecting the share of equity in the financing structure. This was done to assess the level of financial independence of enterprises and the share of equity in the overall structure of financing sources. To determine the relationship between the capital structure and profitability indicators, a correlation analysis was conducted between the Debt-to-Equity Ratio, Equity ratio, ROA and ROE indicators for three enterprises. Correlation analysis was used to assess the strength and direction of the relationship between the level of debt load, the share of equity and profitability indicators of enterprises in the real sector of the economy of Ukraine.

Using the method of comparative analysis and generalisation of the results of the empirical study, the impact of the level of debt load, financial leverage, liquidity and the structure of financing sources on the profitability and financial stability of enterprises in the industrial, transport and construction sectors was analysed. Based on the results obtained, the main directions for optimising the ratio of equity and loan capital were determined, approaches to financial risk management were substantiated and practical recommendations were developed to increase the profitability of enterprises in the real sector of the economy of Ukraine. The limitation of this study is the use of a limited number of enterprises representing only three sectors of the real economy of Ukraine and the restricted availability of comparable official financial reporting data under wartime conditions.

Results and Discussion

Theoretical foundations of the formation of the capital structure of enterprises

The capital structure of an enterprise determines the ratio of sources of financing for the operating, investment and financial activities of a business entity. It affects the financial stability, liquidity, profitability and market value of the enterprise. The economic essence of the capital structure is to determine the optimal ratio between own and borrowed financial resources to

maximise the value of the enterprise and minimise financial risks. The capital structure reflects the financial policy of the enterprise, the level of dependence on external sources of financing and the efficiency of resource use (Berest & Sablina, 2022).

The main components of the capital structure are equity and debt capital. Equity capital includes authorised capital, reserve capital, retained earnings and other internal sources of financing. Its advantages are the absence of mandatory payments and a lower level of financial risk, however, the cost of such capital is relatively high due to investors' expectations of profitability. Debt capital includes bank loans, bond loans, financial leasing and accounts payableIts use allows enterprises to expand activities and implement investment projects without increasing equity investments, while interest expenses provide a tax effect. However, excessive use of debt financing increases debt servicing costs and financial risks. The capital structure also includes hybrid instruments, in particular convertible bonds, preferred shares and mezzanine financing, which combine the features of equity and debt capital. Their use allows enterprises to diversify sources of financing and increase the flexibility of financial policy. The formation of the capital structure depends on the profitability of the enterprise, the cost of financial resources, asset liquidity, stage of the life cycle, industry specifics and macroeconomic conditions. Capital-intensive enterprises are characterised by a higher level of use of debt capital due to significant needs in financing long-term assets (Loth, 2026).

The ratio of equity and debt capital directly affects the financial results of the enterprise. A rational capital structure ensures the efficient use of financial resources, maintains the stability of cash flows and creates conditions for development. Debt financing also makes it possible to implement investment projects without expanding the circle of owners and helps reduce the weighted average cost of capital due to the tax effect. At the same time, an increase in the share of borrowed funds increases interest expenses, which negatively affects the profitability of assets, liquidity and solvency of the enterprise. A significant debt load reduces financial flexibility and investment attractiveness, especially in conditions of economic instability. The predominance of equity capital reduces financial risk, but can restrain development due to limited resources and a higher cost of equity capital. The optimal ratio of equity and borrowed funds allows minimising the weighted average cost of capital (WACC) and increasing the efficiency of the enterprise. After reaching a certain level of debt burden, financial risks begin to outweigh the benefits of using borrowed resources, which leads to an increase in the cost of capital and a decrease in the efficiency of the enterprise. Studies of enterprise capital structure management also show that maintaining a high share of equity capital contributes to financial independence, liquidity and resilience to external economic shocks, while a balanced combination of equity and borrowed funds ensures flexibility in financing and supports the implementation of investment projects. In addition, the effectiveness of capital structure management is assessed through indicators of return on equity, return on total capital, financial leverage ratio, interest coverage ratio and the ratio of borrowed to equity capital, which characterise the enterprise's ability to maintain solvency and profitability under market instability (Hramatovych, 2026).

The effect of financial leverage is based on the use of borrowed funds to increase the profitability of equity. Important components of financial leverage are the ratio of borrowed and equity capital, as well as the difference between the profitability of assets and the cost of debt financing. Attracting borrowed resources allows financing investment projects even with a limited amount of own funds and provides a tax effect by attributing interest expenses to the expenses of the enterprise. At the same time, excessive use of financial leverage leads to an increase in debt servicing costs and financial risks. If the cost of credit resources exceeds the profitability of assets, the effect of financial leverage becomes negative and reduces the profitability of equity. The most sensitive to the use of borrowed resources is the ROE indicator, while the profitability of assets and net profitability of sales may decrease due to an increase in interest expenses. A high level of debt burden also increases the risk of loss of liquidity and financial stability of the enterprise in conditions of economic recession, inflationary pressure or decrease in income. Research results also confirm that financial leverage directly affects the indicators of ROA, Debt to Asset Ratio (DAR) and Debt to Equity Ratio (DER), which are widely used to assess the effectiveness of capital structure management and the level of financial risk of enterprises. Empirical studies conducted on enterprises in the food and beverage sector showed that the Debt to Equity Ratio has a statistically significant positive effect on ROA, while the Debt to Asset Ratio may negatively affect profitability due to the growth of debt dependence and interest costs. It was also established that excessive debt financing increases the dependence of enterprises on external creditors and reduces financial flexibility in conditions of market instability (Moridu, 2024). Therefore, the capital structure is one of the key factors determining the financial stability, profitability and financial flexibility of enterprises in the real sector of the economy. A balanced ratio of equity and debt capital contributes to maintaining liquidity, reducing the cost of capital and supporting investment activity. At the same time, the effectiveness of financial leverage depends on the level of debt burden, operating profitability and the ability of enterprises to control financial risks under conditions of economic instability.

This study and the study by R.A. Alhamdan & G.F. Almatarneh (2024) were similar in general scientific logic, since in both works capital structure was considered as an important factor in the efficiency of enterprises. In

both studies it was emphasised that the ratio of equity and debt capital affected the financial stability, risk level and development of enterprises. Also, both works focused on the importance of financial leverage and the need to form an optimal capital structure. In the work of R. A. Alhamdan & G. F. Almatarneh (2024) the impact of capital structure on corporate governance of Jordanian industrial companies, in particular on the sise and independence of the board of directors and the audit committee, was studied. The study covered 35 enterprises for the period from 2017 to 2022 and was based on multiple regression. In contrast, in this study the main focus was on the impact of capital structure on the profitability, financial stability and efficiency of capital use of enterprises.

Another approach was presented in the work of B.T.T. Loan *et al.* (2024), which analysed 277 newly established enterprises in Vietnam during the first five years of their operation. The authors found that the average level of financial leverage was 42.6%, and the share of bank loans in the capital structure was 21%. At the same time, an increase in financial leverage by 1% was accompanied by an increase in profitability by approximately 0.051%, which indicated a positive impact of debt financing on the development of new enterprises. This study also recognised the importance of financial leverage, but emphasised the need to maintain a balanced ratio of equity and debt capital to minimise financial risks and ensure the stability of enterprises in conditions of economic instability. A similar problem was observed in the study of X. Tian *et al.* (2024), but the authors supplemented the analysis of the impact of capital structure with an examination of the role of business model innovation. Using data from 374 high-tech companies in China's Growth Enterprise Market (GEM) from 2016 to 2022 and the system generalised method of moments (sys-GMM), they found that the average debt burden was 36%, short-term debt was 29.7%, and ownership concentration was 51.5%. They also found a U-shaped relationship between debt and firm performance. In contrast, this study focused on the risks of excessive debt, which could lead to reduced liquidity and financial stability.

At the same time, the study by J.M.F. Gomes dos Passos *et al.* (2026) allowed considering the problem of capital structure in a broader scientific context. The authors conducted a bibliometric analysis of 308 scientific papers for 2000-2024 and found a significant increase in the number of studies after 2015. The highest level of citations was observed in 2010 – about 1400 citations. The researchers identified two main areas of modern scientific research: classical theories of capital structure and practical models of optimising financial decisions. In contrast to such a generalised bibliometric approach, this study was focused on the theoretical substantiation of the influence of financial leverage, financing structure and debt burden on the profitability and financial stability.

Therefore, the capital structure is one of the key factors that determine the financial stability, liquidity, profitability and efficiency of enterprises in the real sector of the economy. It has been established that a rational ratio of equity and debt capital allows to increase the efficiency of the use of financial resources, minimise the weighted average cost of capital and ensure the financial flexibility of the enterprise. It has been proven that the use of financial leverage can contribute to the growth of the profitability of equity capital provided that the profitability of assets exceeds the cost of attracted resources, however, excessive debt burden increases financial risks and reduces the level of financial stability.

Analysis of capital structure impact on enterprise profitability

PJSC "Interpipe NTRP" (n.d.) is one of the largest industrial enterprises in Ukraine, specialising in the production of steel pipes, railway wheels, wheel sets and steel billets. The enterprise operates in the industrial sector of the economy and sells products both in the domestic and foreign markets. The company is characterised by high capital intensity of production, significant needs in financing long-term assets and active use of borrowed capital to support operating and investment activities. In conditions of military instability, logistical constraints and increasing cost of credit resources, analysis of the capital structure of PJSC "Interpipe NTRP" allows to assess the impact of the ratio of equity and borrowed capital on the indicators of profitability and financial stability of the enterprise. To assess the impact of the capital structure on the indicators of profitability and financial stability of the enterprise, the main financial indicators of PJSC "Interpipe NTRP" for 2022-2024 were analysed (Table 1).

Table 1. *Main indicators of capital structure and profitability of Interpipe in 2022-2024*

Indicator	2022	2023	2024
Total assets, ths. UAH	30,712,155	42,080,440	49,787,892
Total equity, ths. UAH	7,523,946	20,161,546	27,154,470
Total liabilities, ths. UAH	23,188,209	21,918,894	22,633,422
Long-term borrowings, ths. UAH	12,788,199	11,994,472	12,670,182
Current liabilities, ths. UAH	8,892,928	8,333,004	8,497,986
Revenue, ths. UAH	37,680,034	37,570,828	44,116,422
Net profit, ths. UAH	9,248,054	9,610,134	11,780,118
Finance costs, ths. UAH	3,982,356	2,922,010	1,673,616

Table 1, Continued

Indicator	2022	2023	2024
Cash and cash equivalents, ths. UAH	5,623,331	9,403,974	11,991,168
Debt-to-Equity Ratio	3.08	1.09	0.83
ROA, %	30.1	22.8	23.7
ROE, %	122.9	47.7	43.4
Equity ratio	0.25	0.48	0.55

Source: *compiled by author based on Interpipe Holdings PLC (2022; 2023;2024)*

Analysis of the performance of PJSC "Interpipe NTRP" in 2022-2024 showed a gradual improvement in the capital structure and a decrease in the debt burden of the enterprise. In 2022, the company was characterised by a high dependence on borrowed capital, as evidenced by the Debt-to-Equity Ratio at 3.08 and a low autonomy coefficient of 0.25. In subsequent years, the volume of equity increased from UAH 7.5 billion in 2022 to UAH 27.2 billion in 2024, while the total volume of liabilities decreased from UAH 23.2 billion to UAH 22.6 billion. This contributed to increasing the financial stability of the enterprise and reducing dependence on external sources of financing. At the same time, financial expenses decreased from UAH 4.0 billion in 2022 to UAH 1.7 billion in 2024, which had a positive impact on the net profit of the enterprise. Net profit increased from UAH 9.2 billion in 2022 to UAH 11.8 billion in 2024, and the autonomy ratio increased to 0.55. Return on assets during the period under review remained at a high level, while return on equity gradually decreased due to an increase in the share of equity and a reduction in the effect of financial leverage. The growth in cash and cash equivalents from UAH 5.6 billion in 2022 to UAH 12.0 billion in 2024 also indicated an improvement in the liquidity and solvency of the enterprise.

JSC "Ukrzaliznytsia" (n.d.) is the largest enterprise in the transport sector of Ukraine and performs the functions of the national railway carrier. The main areas of activity of the company are freight and passenger transportation, provision of logistics services, operation and maintenance of railway infrastructure, repair of rolling stock and ensuring the functioning of the state transport system. The enterprise is characterised by high capital intensity, a significant share of non-current assets and significant needs in financing long-term investment programs. Under martial law, JSC "Ukrzaliznytsia" ensured the stability of transport connections, evacuation transportation and support for the logistics processes of the Ukrainian economy. To assess the impact of the capital structure on the financial results and the level of financial stability of the enterprise, the main financial indicators of JSC "Ukrzaliznytsia" for 2022-2025 were analysed (Table 2).

Table 2. *Main indicators of capital structure and profitability of JSC "Ukrzaliznytsia" in 2022-2025*

Indicator	2022	2023	2024	2025
Total assets, ths. UAH	259,373,726	249,560,123	279,038,815	298,892,591
Total equity, ths. UAH	190,567,716	190,621,186	193,952,363	180,775,880
Total liabilities, ths. UAH	68,806,010	58,938,937	85,086,452	118,116,711
Long-term liabilities / loans, ths. UAH	43,665,610	45,624,463	54,523,529	21,403,305
Current liabilities / financial liabilities, ths. UAH	25,140,400	13,314,474	4,775,015	36,765,750
Revenue, ths. UAH	77,410,627	92,617,631	102,870,908	88,979,794
Gross profit (loss), ths. UAH	1,364,052	8,668,023	5,685,302	(11,470,604)
Operating profit (loss), ths. UAH	9,943	382,124	(1,121,549)	(3,258,519)
Net profit (loss), ths. UAH	(5,642,827)	(5,644,093)	(2,710,810)	(7,663,426)
Finance costs / financial expenses, ths. UAH	10,395,573	8,050,118	4,822,649	5,365,823
Cash and cash equivalents, ths. UAH	7,574,579	7,895,874	13,020,303	10,957,460
Debt-to-Equity Ratio	0.36	0.31	0.44	0.65
ROA, %	-2.2	-2.3	-1.0	-2.6
ROE, %	-3.0	-3.0	-1.4	-4.2
Equity ratio	0.73	0.76	0.69	0.60

Source: *compiled by author based on Joint Stock Company "Ukrainian Railways" (2022; 2023; 2024; 2025)*

Analysis of the indicators of JSC "Ukrzaliznytsia" in 2022-2025 showed that the company maintained a relatively high level of financial independence due to a significant share of equity in the structure of liabilities. In 2022-2023, the autonomy ratio exceeded 0.70, and the Debt-to-Equity Ratio remained at a moderate level, which indicated a relatively low dependence of the company on debt financing. At the same time, in 2024-2025, an increase in the debt load was observed, as a result of which the Debt-to-Equity Ratio increased from 0.31 in 2023 to 0.65 in 2025, and the autonomy ratio decreased to 0.60. This indicated an increase in

the company's dependence on external sources of financing in conditions of military instability and the need to maintain investment activities. The company's financial results remained unprofitable throughout the period under study. The largest net loss was recorded in 2025 – UAH 7.7 billion, which was accompanied by a deterioration in the indicators of profitability of assets and equity. Despite the growth of income in 2023-2024, significant financial expenses, inflationary pressure, currency risks and costs of maintaining the functioning of the infrastructure negatively affected the profitability of the enterprise. At the same time, the company maintained a high volume of assets and a sufficient level of liquidity, which allowed it to maintain the continuity of operations even in conditions of significant economic and military risks.

JSC "Construction Company "Ukrbud" (n.d.) is one of the enterprises of the construction sector of Ukraine, which operates in the field of construction of residential and non-residential facilities, design, engineering and construction works and real estate transactions. The company operates in the form of a state joint-stock company, and its activities are characterised by significant dependence on investment activity and the general state of the construction market. To assess the impact of the capital structure on the financial results of the enterprise, the main performance indicators of Joint Stock Company "Construction Company "Ukrbud" for 2022-2024 were analysed (Table 3).

Table 3. *Main indicators of capital structure and profitability of JSC "Construction Company "Ukrbud" in 2022-2024*

Indicator	2022	2023	2024
Total assets, ths. UAH	273,228	266,626	255,437
Total equity, ths. UAH	246,685	243,192	229,720
Total liabilities, ths. UAH	26,543	23,434	25,717
Current liabilities, ths. UAH	26,543	23,434	25,717
Revenue, ths. UAH	54,034	125,683	66,653
Gross profit, ths. UAH	8,309	7,572	9,661
Operating profit (loss), ths. UAH	(4,133)	(2,853)	(14,322)
Net profit (loss), ths. UAH	(3,833)	(3,493)	(13,472)
Cash and cash equivalents, ths. UAH	7,199	9,459	5,630
Debt-to-Equity Ratio	0.11	0.10	0.11
ROA, %	-1.40%	-1.31%	-5.27%
ROE, %	-1.55%	-1.44%	-5.86%
Equity ratio	0.90	0.91	0.90

Source: *compiled by author based on JSC "Construction Company "Ukrbud" (2023; 2024)*

Analysis of the indicators of JSC "Construction Company "Ukrbud" showed that in 2022-2024 the company maintained a high level of financial independence, since the share of equity in the structure of assets remained at about 90%. Equity decreased from UAH 246.7 million in 2022 to UAH 229.7 million in 2024, while total liabilities fluctuated within UAH 23.4 million and UAH 26.5 million. As a result, the Debt-to-Equity Ratio remained low and stable at 0.10 and 0.11, which indicated a low level of dependence on borrowed capital. At the same time, the Equity ratio remained at 0.90 and 0.91 throughout the analysed period, confirming the predominance of own sources of financing in the company's capital structure. Revenue increased from UAH 54.0 million in 2022 to UAH 125.7 million in 2023, but in 2024 decreased to UAH 66.7 million. Gross profit also changed unevenly, amounting to UAH 8.3 million in 2022, UAH 7.6 million in 2023 and UAH 9.7 million in 2024. At the same time, operating and net losses increased significantly in 2024. Operating loss reached UAH 14.3 million in 2024 compared to UAH 2.9 million in 2023, while net loss increased to UAH 13.5 million in 2024. This led to deterioration in profitability indicators, since ROA decreased from -1.31% in 2023 to -5.27% in 2024, and ROE from -1.44% to -5.86%, respectively. The reduction in cash and cash equivalents from UAH 9.5 million in 2023 to UAH 5.6 million in 2024 also indicated a decline in liquidity reserves and financial flexibility.

A comparison of the capital structure and profitability indicators of the studied enterprises showed the presence of different financing models depending on the specifics of the economic sector. The highest level of financial leverage was characteristic of PJSC "Interpipe NTRP", where the Debt-to-Equity Ratio in 2022 was 3.08, which was accompanied by the highest return on equity (122.9%). At the same time, enterprises with a lower level of debt load, in particular JSC "Construction Company "Ukrbud", demonstrated negative ROE and ROA indicators despite maintaining high financial autonomy. This indicated that a low share of borrowed capital does not always ensure high efficiency in the use of financial resources. The results of the analysis also showed that the positive effect of financial leverage was observed only under conditions of sufficient operating profitability and effective control of financial expenses. In PJSC "Interpipe NTRP", the reduction of financial expenses from UAH 4.0 billion to UAH 1.7 billion was accompanied by an increase in net profit and an improvement in financial stability indicators. In contrast, in JSC "Ukrzaliznytsia" even a moderate level of debt load did not ensure an

increase in profitability due to the unprofitability of operating activities and significant debt servicing costs. This indicated that the efficiency of using borrowed capital depends not only on its volume, but also on the enterprise's ability to generate stable cash flows and maintain positive operating results. To assess the relationship between the capital structure and profitability indicators of enterprises in the real sector of the economy of Ukraine, a correlation analysis was conducted based on data from enterprises in the industrial, transport and construction sectors for 2022-2025. The results of the correlation analysis are presented in Table 4.

Table 4. *Correlation matrix of the relationship between capital structure and profitability indicators of enterprises in the real sector of the economy*

Indicators	Debt-to-Equity Ratio	ROA	ROE	Equity ratio
Debt-to-Equity Ratio	1.00	0.82	0.96	-0.91
ROA	0.82	1.00	0.92	-0.85
ROE	0.96	0.92	1.00	-0.87
Equity ratio	-0.91	-0.85	-0.87	1.00

Source: *calculated by author*

The results of the correlation analysis showed a strong direct relationship between Debt-to-Equity Ratio and ROA, since the correlation coefficient was 0.82. This indicated that an increase in the share of borrowed capital in some cases was accompanied by an increase in the profitability of assets, primarily under conditions of more active use of financial leverage. An even stronger direct relationship was found between Debt-to-Equity Ratio and ROE, where the correlation coefficient reached 0.96. This indicated a significant relationship between the level of debt financing and the profitability of equity capital. A high positive correlation was also observed between ROA and ROE at the level of 0.92, indicating that changes in asset profitability were closely associated with changes in return on equity.

At the same time, a strong inverse relationship was established between Equity ratio and ROA, with a correlation coefficient of -0.85. This indicated that enterprises with a higher share of equity financing were characterised by lower profitability of assets. A similarly strong inverse relationship was observed between Equity ratio and ROE at the level of -0.87, which reflected a weakening of the financial leverage effect under conditions of a predominance of equity capital in the financing structure. In addition, a strong negative relationship was identified between Equity ratio and Debt-to-Equity Ratio, where the correlation coefficient was -0.91, which corresponded to the inverse economic nature of these indicators. Overall, the results of the analysis indicated that the efficiency of capital use in the studied enterprises depended not only on the volume of borrowed resources, but also on the ability to maintain operating profitability and effectively manage financial obligations. Thus, the results of the correlation analysis confirmed the presence of a close relationship between the capital structure and profitability indicators of enterprises in the real sector of the economy of Ukraine. Moderate use of borrowed capital contributed to increasing profitability, however, the effectiveness of financial leverage depended on the level of operating profitability, financial costs and overall financial stability of enterprises.

The results of this study were generally consistent with the conclusions of F. Ndruru & P. Ananda (2025), who also considered capital structure as an important factor in the profitability and financial stability of enterprises. The authors found that emerging market companies were characterised by a high level of debt financing: the Debt-to-Equity Ratio often exceeded 1.0-2.0, while the average profitability of enterprises remained at only 5-10%. They paid special attention to the relationship between liquidity, profitability and debt load. For example, PT A.I. Tbk with an ROE of 17.7% had a Debt-to-Equity Ratio of less than 1, while PT M.D.S. Tbk had a debt load of 447% even with an ROE of 15%. A similar trend was observed in this study: the decrease in the Debt-to-Equity Ratio of PJSC "Interpipe NTRP" from 3.08 in 2022 to 0.83 in 2024 was accompanied by strengthening financial stability and increasing equity. At the same time, the examples of JSC "Ukrzaliznytsia" and JSC "Construction Company "Ukrbud" showed that even a high share of equity did not guarantee profitability in conditions of significant financial costs and economic instability.

Similar conclusions regarding the role of financial leverage were obtained in a study by H. Jiang (2024) on 76 high-tech companies in China. The author found that the average debt burden was 40.84%, and a 1% increase in debt was accompanied by an increase in Tobin's Q of approximately 0.98%, confirming the positive impact of debt financing on the value of companies. In this study, this effect was also evident in the example of PJSC "Interpipe NTRP", where the Debt-to-Equity Ratio of 3.08 in 2022 was combined with a high return on equity of 122.9%. However, Ukrainian enterprises also demonstrated the other side of financial leverage: the results of JSC "Ukrzaliznytsia" and JSC "Construction Company "Ukrbud" confirmed that even a moderate level of debt did not ensure profitability in conditions of high financial costs and an unstable economic environment.

The practical aspect of using debt financing was revealed in more detail in the work of S. Liu (2024), which analysed the activities of Alibaba and Chinese e-commerce enterprises. The author found that the company's Debt Ratio in 2020-2023 was within 33-42%, while ROA increased from 8.73% to 37.41%, and ROE from 15.45% to 58.40%. On this basis, it was determined that the optimal level of debt load for Alibaba was 40-50%, since it was this range that allowed combining the tax benefits of debt financing with financial risk control. In this study, a similar positive effect of financial leverage was also observed in PJSC "Interpipe NTRP", however, the analysis of Ukrainian enterprises at the same time showed a high sensitivity of profitability to macroeconomic instability, inflationary pressure and the cost of credit resources.

Another aspect of capital structure was presented in the study by R.L. Putri & A.P. Willim (2024), which focused on the relationship between asset structure, financial flexibility, and debt financing in Indonesian consumer sector companies. A study of 39 companies on the Indonesian Stock Exchange showed that asset structure and financial flexibility had a positive effect on capital structure, while earnings volatility had no statistically significant effect. The average Debt Assets Ratio was 0.44, and financial flexibility was 0.36. Similar patterns were partially confirmed in this study, as the most capital-intensive enterprises – PJSC "Interpipe NTRP" and JSC "Ukrzaliznytsia" – used debt financing more actively. However, the results of the analysis showed that not only asset structure was crucial, but also the ability of enterprises to generate stable cash flows and control financial costs.

A study by Y. Yohanes (2025), devoted to 26 food industry enterprises in Indonesia, also confirmed the ambiguous impact of debt financing on the performance of enterprises. The author found that the increase in Debt-to-Equity Ratio negatively affected ROA and net profitability of sales, but at the same time positively affected ROE: an increase in the indicator by one unit reduced ROA by 0.0165 points and increased ROE by 0.2103 points. It was also proven that high liquidity weakened the positive impact of financial leverage on the profitability of equity. A similar relationship was observed in this study, where the high level of financial leverage of PJSC "Interpipe NTRP" was accompanied by high ROE indicators, but at the same time increased the risks of financial dependence and loss of stability in conditions of military risks. A general approach to the issue of capital structure was presented in the work of I. Sihombing *et al*. (2025), where the authors, based on a synthesis of previous studies, concluded that profitability, enterprise sise and capital structure in most cases had a positive impact on the value of companies. At the same time, excessive use of debt financing, in their opinion, increased financial risks and the likelihood of financial difficulties. The authors attached particular importance to the Debt-to-Equity Ratio and Debt-to-Asset Ratio indicators as the main indicators for assessing the capital structure. Similar results were obtained in this study, where the high financial leverage of PJSC "Interpipe NTRP" provided significant profitability of equity, while the examples of JSC "Ukrzaliznytsia" and JSC "Construction Company "Ukrbud" demonstrated that even a moderate debt load did not exclude the loss of enterprises under conditions of high financial costs and economic instability.

Therefore, the analysis showed that the capital structure significantly affects the indicators of profitability, financial stability and efficiency of use of financial resources of enterprises in the real sector of the economy of Ukraine. It was found that moderate use of debt capital provided a positive effect of financial leverage and contributed to the growth of return on equity under conditions of sufficient operating profitability of enterprises. The results of correlation analysis confirmed the presence of a strong direct relationship between Debt-to-Equity Ratio and ROA and ROE indicators, while the growth of the share of equity capital was accompanied by a decrease in the level of profitability. The results obtained indicated the need to form a balanced capital structure taking into account industry specifics, financial risks and conditions of economic instability.

Directions for optimising the capital structure of enterprises

The results of the analysis confirmed that the effectiveness of the capital structure of enterprises in the real sector of the economy of Ukraine depends on the ability to ensure a balance between the level of debt burden, profitability and financial stability. It was established that both excessive use of borrowed capital and excessive focus exclusively on own financial resources can negatively affect the financial results of enterprises. The results obtained indicated the feasibility of forming a balanced capital structure that would ensure the maintenance of profitability and at the same time limit financial risks. The analysis of PJSC "Interpipe NTRP" showed the effectiveness of moderate use of financial leverage under conditions of stable operating profitability and control of financial costs. This confirmed the feasibility of optimising the capital structure by gradually reducing expensive credit resources, refinancing liabilities and increasing the share of equity at the expense of retained earnings. For industrial enterprises, optimisation of the capital structure should include the use of long-term financing for the modernisation of production, renewal of fixed assets and maintenance of investment activities. At the same time, excessive growth in short-term liabilities may lead to deterioration of liquidity and increased dependence on external creditors.

The results of the analysis of JSC "Ukrzaliznytsia" indicated the need to strengthen control over debt servicing costs and the efficiency of using attracted financial resources. The growth in the volume of liabilities without

a corresponding increase in operating efficiency was accompanied by deterioration in profitability and financial stability indicators. For transport sector enterprises, important areas of capital structure optimisation are the reduction of short-term financial liabilities, diversification of financing sources and attraction of long-term investment resources. It is also advisable to use state support mechanisms and international financing to modernise infrastructure without an excessive increase in the debt burden.

For JSC "Construction Company "Ukrbud", the results of the analysis showed that a high level of financial autonomy did not provide a sufficient level of profitability of the enterprise. This indicated the need for more active use of debt financing for the implementation of investment projects and expansion of the scale of activities. For enterprises in the construction sector, optimisation of the capital structure may involve the use of long-term lending, project financing and partner investment mechanisms. At the same time, excessive debt burden for enterprises in the construction industry remains risky due to the high dependence of the sector on investment activity and macroeconomic instability. The conducted correlation analysis confirmed the presence of a close relationship between the capital structure and indicators of enterprise profitability. The established direct relationship between Debt-to-Equity Ratio and ROA and ROE indicators indicated the positive impact of moderate use of debt capital on enterprise profitability. At the same time, the strong inverse relationship between the Equity ratio and profitability indicators confirmed that excessive focus exclusively on equity can limit the efficiency of financial resources and inhibit the development of enterprises. This indicated the need to form a flexible financing structure depending on the level of operating profitability, the cost of credit resources and the specifics of the industry.

One of the key areas of optimising the capital structure is managing financial risks and ensuring the financial stability of enterprises. The analysis showed that the growth of the debt burden was accompanied by an increase in the dependence of enterprises on external sources of financing and an increase in financial costs. In such conditions, control of liquidity, solvency and financial leverage indicators becomes important. For enterprises in the real sector of the economy, it is advisable to maintain a sufficient level of liquidity reserves, diversify sources of financing and limit the share of expensive short-term credit resources in the capital structure. In conditions of economic instability and military risks, an important area of ensuring financial stability is increasing the efficiency of managing cash flows and financial costs. Enterprises with higher liquidity levels have a greater ability to maintain business continuity and reduce the risk of solvency loss. This confirmed the feasibility of forming cash reserves, controlling the volume of credit burden, and increasing the efficiency of working capital use.

Practical recommendations for increasing the profitability of enterprises in the real sector of the economy should take into account the industry specifics of the enterprises' activities. For industrial enterprises, it is advisable to use moderate financial leverage to finance the modernisation of production and investment activities. For enterprises in the transport sector, the priority areas remain the optimisation of debt service costs, increasing operational efficiency and attracting long-term financing. For construction enterprises, it is important to expand sources of investment financing and intensify the use of loan capital, provided that financial risks are controlled. Thus, the results of the analysis confirmed that the optimisation of the capital structure of enterprises in the real sector of the economy of Ukraine should be based on maintaining a balanced ratio of equity and loan capital, controlling financial risks and ensuring a sufficient level of liquidity. Moderate use of loan financing contributed to increasing the profitability of equity and expanding opportunities for financing investment activities, however, the effectiveness of financial leverage depended on the level of operating profitability, the cost of credit resources and the overall financial stability of enterprises.

The issue of optimal capital structure in this study largely echoed the findings of I. Akin *et al.* (2025), who analysed Financial Times Stock Exchange (FTSE) 100 companies for 2019-2023. The authors proved that a higher level of debt financing and a larger sise of companies had a positive impact on enterprise value (EV). The average capital structure indicator was 0.65, Tobin's Q was 0.96, and the correlation between EV and company sise reached 0.923. At the same time, this study showed that the positive effect of financial leverage was not universal. For example, for PJSC "Interpipe NTRP" Debt-to-Equity Ratio 3.08 in 2022 was accompanied by ROE at the level of 122.9%, while for JSC "Ukrzaliznytsia" and JSC "Construction Company "Ukrbud" even moderate debt load did not provide high profitability due to significant financial costs and instability of the economic environment.

A similar relationship between debt financing and enterprise performance was also observed in the study by A. Stoiljković *et al.* (2024), dedicated to Serbian manufacturing companies. The authors found that leverage performed a disciplinary function, reduced agency costs and positively affected the efficiency of enterprises. However, they also emphasised that excessive debt increased the risks of underinvestment and financial instability. This duality of effect was also observed in this study: the high financial leverage of PJSC "Interpipe NTRP" provided a significant return on equity, but at the same time increased the company's dependence on external financing. More restrained conclusions regarding the effectiveness of debt financing were obtained by T.N. Tesema (2024) on the example of 85 manufacturing enterprises in Ethiopia for 2017-2021. Using the Total Debt Ratio (TOD) and Long-Term Debt Ratio (LTD) indicators, the author proved that the increase in debt

negatively affected Net Operating Profitability (NOP) and ROA, which was consistent with the provisions of the pecking order theory. Similar trends were partially confirmed by the results of this study, since the examples of JSC "Ukrzaliznytsia" and JSC "Construction Company "Ukrbud" showed that even a relatively low level of debt did not guarantee profitability under conditions of significant financial costs and military risks. At the same time, the example of PJSC "Interpipe NTRP" showed that the effective use of borrowed capital could still have a positive impact on ROE.

The practical aspect of the relationship between profitability and capital structure was more pronounced in the study by T. Siahaan & A.F. Putra (2024), which analysed 14 banks on the Indonesian Stock Exchange. The authors found that the average level of ROA was 2.09%, ROE – 11.79%, and Debt-to-Equity Ratio – 4.57. In addition, an increase in ROA by 1% was accompanied by an increase in Price-to-Book Value by 57.967, while an increase in DER by 1% increased the market value of companies by 0.104. This study also observed a positive effect of financial leverage on the return on equity, but the results of Ukrainian enterprises showed that a high level of debt in conditions of economic instability significantly increased financial risks. The issue of finding the optimal ratio of equity and debt capital was considered in detail in the work of R. Arhinful *et al.* (2025), which analysed 750 non-financial companies on the New York Stock Exchange. The authors compared three options for the capital structure – 70/30, 61.8/38.2 and 50/50 – and concluded that a high level of debt financing had a positive effect on both ROA and ROE. In this study, a similar effect was confirmed by the example of PJSC "Interpipe NTRP", where significant financial leverage ensured high profitability of equity capital. At the same time, the gradual decrease in the Debt-to-Equity Ratio to 0.83 in 2024 contributed to strengthening the financial stability of the enterprise, which indicated the need to balance profitability and risk.

Unlike most of the reviewed works, the study by M. Wu *et al.* (2024) was devoted not to industrial enterprises, but to Chinese banks and the impact of income diversification on profitability and risk. The authors found that the average level of ROA of banks decreased from 1.28% in 2008 to 1.03% in 2019, while the share of non-interest income increased from 0.12 to 0.30. The study showed that diversification could increase the efficiency of state-owned banks, but at the same time increased risks by excessively complicating the income structure. In this study, a similar risk was manifested due to the excessive dependence of enterprises on debt financing: a high level of financial leverage ensured short-term growth in ROE, but at the same time reduced financial flexibility and increased dependence on external sources of capital.

Thus, the results of the study confirmed that the capital structure had a significant impact on the profitability, financial stability and efficiency of the use of financial resources of enterprises in the real sector of the economy of Ukraine. The analysis showed that moderate use of debt capital contributed to increasing ROA and ROE indicators, while excessive debt burden increased financial risks and worsened liquidity and solvency indicators. The conducted correlation analysis confirmed the presence of a strong relationship between the ratio of equity and debt capital and the profitability indicators of enterprises in the industrial, transport and construction sectors. The results obtained indicated the need to form a balanced and flexible capital structure taking into account industry specifics, the cost of financial resources and the level of financial risks in conditions of economic instability.

Conclusions

The study confirmed that capital structure significantly affected the profitability and financial stability of enterprises in the real sector of the economy of Ukraine. The analysis of Private Joint Stock Company "Interpipe NTRP" showed that moderate use of financial leverage contributed to maintaining high profitability indicators. The Debt-to-Equity Ratio decreased from 3.08 in 2022 to 0.83 in 2024, while equity increased from UAH 7.5 billion to UAH 27.2 billion. Net profit increased from UAH 9.2 billion to UAH 11.8 billion. The analysis of Joint Stock Company "Ukrzaliznytsia" showed that even a moderate level of debt burden did not ensure profitability under wartime instability. During 2022-2025, the Debt-to-Equity Ratio increased from 0.31 in 2023 to 0.65 in 2025, while the Equity ratio decreased from 0.76 to 0.60. The enterprise remained unprofitable, and the largest net loss was recorded in 2025 at UAH 7.7 billion despite assets exceeding UAH 298.9 billion. The analysis of Joint Stock Company "Construction Company "Ukrbud" showed that a high level of financial autonomy did not ensure profitability. During 2022-2024, the Equity ratio remained high at 0.90-0.91, while the Debt-to-Equity Ratio remained low at 0.10-0.11.

The correlation analysis indicated a strong direct relationship between Debt-to-Equity Ratio and Return on Equity (0.96), as well as between Debt-to-Equity Ratio and Return on Assets (0.82). A strong inverse relationship was found between Equity ratio and Return on Equity (-0.87), while a strong negative relationship was identified between Equity ratio and Debt-to-Equity Ratio (-0.91). Overall, the study showed that the effectiveness of capital structure depended on the ability of enterprises to maintain profitability and control financial costs. Prospects for further research involve expanding the sample of enterprises and assessing the long-term impact of capital structure changes on profitability and financial resilience under post-war economic recovery conditions.

Acknowledgements

None.

Funding

None.

Conflict of Interest

None.

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Вплив структури капіталу на рентабельність підприємств реального сектору економіки

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Анотація. Метою цього дослідження було визначення впливу структури капіталу на рентабельність та фінансову стійкість підприємств реального сектора економіки України. Дослідження базувалося на емпіричному порівняльному фінансовому аналізі, у межах якого було застосовано методи фінансового, коефіцієнтного, порівняльного та кореляційного аналізу для оцінювання взаємозв'язку між структурою капіталу та показниками рентабельності підприємств. Результати дослідження показали, що коефіцієнт співвідношення позикового та власного капіталу Приватного акціонерного товариства «Інтерпайп» знизився з 3,08 у 2022 році до 0,83 у 2024 році, тоді як власний капітал зріс із 7,5 млрд грн до 27,2 млрд грн, а чистий прибуток збільшився з 9,2 млрд грн до 11,8 млрд грн. Для Акціонерного товариства «Укрзалізниця» встановлено зростання коефіцієнта співвідношення позикового та власного капіталу з 0,31 у 2023 році до 0,65 у 2025 році та збереження збитковості з найбільшим чистим збитком у розмірі 7,7 млрд грн у 2025 році. Аналіз Державної акціонерної компанії «Будівельна компанія «Укрбуд» показав, що навіть за високого рівня фінансової автономії компанія залишалася збитковою, а чистий збиток зріс до 13,5 млн грн у 2024 році. Кореляційний аналіз підтвердив наявність сильного прямого зв'язку між коефіцієнтом співвідношення позикового та власного капіталу і рентабельністю власного капіталу на рівні 0,96, а також між коефіцієнтом співвідношення позикового та власного капіталу і рентабельністю активів на рівні 0,82. Результати підтвердили, що помірне використання позикового капіталу сприяло підвищенню рентабельності підприємств, однак ефективність фінансового важеля залежить від рівня операційної рентабельності, фінансових витрат та загальної фінансової стійкості підприємств. Практичне значення дослідження полягає в можливості використання отриманих результатів керівниками підприємств, фінансовими аналітиками та інвесторами для оптимізації співвідношення власного та позикового капіталу й підвищення фінансової стійкості в умовах економічної нестабільності

Ключові слова: фінансовий важіль; позикове фінансування; коефіцієнт автономії; рентабельність активів; вартість підприємства; чистий збиток

ECONOMIC FORUM
Journal homepage: https://e-forum.com.ua/en
Vol. 16, No. 2, 2026, 66-79
ISSN 2308-8559
e-ISSN 2415-8224
Article's History: Received: 28.12.2025 Revised: 30.03.2026 Accepted: 28.05.2026 Published: 25.06.2026

UDC 657.3:336.5
DOI: 10.62763/ef/2.2026.66

The impact of the updated sections of IFRS for SMEson the quality, transparency and comparabilityof financial reporting of enterprises

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Abstract. The purpose of this study was to determine the impact of the updated provisions of International Financial Reporting Standards for Small and Medium-sized Enterprises on the quality, transparency, and comparability of financial reporting. The methodology was based on theoretical, normative, and comparative analysis of the updated International Financial Reporting Standards for Small and Medium-sized Enterprises with case-study analysis. It was established that before the update, financial statements could contain material misstatements related to incomplete recognition of liabilities, which at enterprises with a high share of lease transactions could be underestimated by 27-32%. The results showed that harmonisation of the International Financial Reporting Standards for Small and Medium-sized Enterprises with full International Financial Reporting Standards improved the reliability and analytical value of financial information and reduced information asymmetry. A practical assessment was conducted using HECOTEC and Azerişıq Açıq Səhmdar Cəmiyyəti. For HECOTEC, the updated requirements improved the transparency of financial information through enhanced disclosure of accounting estimates, management judgements and economically significant business relationships. Analysis of Azerişıq Açıq Səhmdar Cəmiyyəti's 2024 financial statements identified impairment losses of AZN 3.0 million, deferred tax liabilities of AZN 98.2 million, exchange-rate effects on cash and cash equivalents of AZN 616 thousand, total liabilities of AZN 841.6 million and equity of AZN 2,779.1 million. These indicators demonstrated the practical significance of the updated requirements for improving the reliability, transparency and comparability of financial reporting. The findings confirmed that the updated provisions improved reporting reliability by reducing distortions in the presentation of liabilities, accounting estimates, financial risks and economically significant relationships

Keywords: harmonisation; disclosure requirements; information asymmetry; corporate governance; decision-making

Introduction

Modern conditions of economic development, globalisation of markets and the growing role of small and medium-sized enterprises in the formation of Gross Domestic Product determine increased requirements for the informativeness and reliability of their financial reporting. In this context, the application of international accounting standards, in particular International Financial Reporting Standard (IFRS) for Small and Medium-sized Entities (SMEs), which are designed to ensure the unity of approaches to recognition, measurement and disclosure of information, is of particular importance.

The complexity of preparing financial statements in accordance with international standards, the presence of differences in approaches to determining qualitative characteristics and assessing reporting elements necessitate further research. In their study, E. Jafarov &

Suggested Citation:

Khalilov, H. (2026). The impact of the updated sections of IFRS for SMEs on the quality, transparency and comparability of financial reporting of enterprises. *Economic Forum*, 16(2), 66-79. doi: 10.62763/ef/2.2026.66.

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N. Babayev (2024) analysed the features of preparing financial statements in accordance with international standards. The authors established significant discrepancies between individual sections of the standards, which complicated the reporting process for enterprises. The work substantiated the need to harmonise approaches to determining qualitative characteristics of financial information and improve methods for assessing assets, liabilities, income and expenses. The impact of the implementation of IFRS on the quality of financial reporting of transnational companies was analysed by A. Johri (2024). The author proved the positive impact of IFRS implementation on the relevance, accuracy, understandability, comparability and timeliness of financial information, and also found that the key factors of implementation are perceived benefits, ease of application and government policy.

Variability in the financial reporting of private enterprises, limited transparency and insufficient comparability of indicators necessitate further research into the impact of regulatory changes on the characteristics of reporting. The consequences of implementing a standard based on IFRS for SMEs, as analysed by N. Hellman *et al.* (2022), affected the financial reporting of private companies. The authors found that the implementation of the new standard contributed to a decrease in the level of profit smoothing, an increase in the quality of accounting indicators and an improvement in the comparability of financial reporting of enterprises. A. Hossen *et al.* (2025) in their study analysed the impact of the application of IFRS on the characteristics of financial reporting of enterprises. The authors found that the implementation of the standards contributed to increasing the reliability and relevance of financial information, as well as reducing the level of information asymmetry between enterprises and users of reporting.

The variability of approaches to financial reporting formation, combined with limited preparation effectiveness and the influence of institutional conditions, necessitates further research. The impact of IFRS implementation, as examined by G.V. Paula Alarcón *et al.* (2024), concerned the comparability, quality and efficiency of financial reporting in the public sector and developing countries. The authors found that IFRS application significantly improved comparability and quality of financial reports by enhancing transparency, accuracy and reducing information asymmetry. A study of the opportunities and benefits of applying IFRS for SMEs in Ukraine was conducted by O.M. Savitska & S.S. Ryndenko (2024), who found that the use of the standard contributes to increasing the transparency of financial reporting, improving the comparability of financial indicators and strengthening the trust of stakeholders. It was also determined that the simplified structure of IFRS for SMEs reduces the administrative burden on enterprises and facilitates the transition from national standards to international requirements.

The implementation of international standards depends on institutional, organisational and behavioural factors, as well as the level of enterprise readiness, which necessitates further research. The factors facilitate or hindering IFRS implementation in a developing economy were examined, with H.T. Nguyen *et al.* (2023) focusing on key institutional and organisational determinants. The authors found that compliance with regulations, accountants' qualifications and experience, management awareness and perceived benefits positively influence implementation, while tax pressure and psychological barriers have a negative effect. In their study, T. Kladnytska & A. Meish (2025) investigated the impact of international accounting standards on the financial reporting of enterprises in Ukraine and found that the integration of IFRS contributes to increasing transparency, improving access to financial resources and strengthening investor confidence. The authors also emphasised that the implementation of international standards requires significant organisational, financial and personnel adaptation, including the development of methodological support and professional training systems.

The impact of the updated IFRS for SMEs on the quality, transparency and comparability of financial reporting remains insufficiently studied, considering international context, institutional and economic conditions, and specifics of practical application and recent changes in the standard. The purpose of this study was to determine the impact of the modernisation of IFRS for SMEs on the qualitative characteristics of financial information. To achieve this goal, the following tasks were defined: to analyse the key changes in the updated provisions of IFRS for SMEs and determine their impact on the formation and transformation of enterprises' financial reporting; to assess the impact of the updated provisions of the standard on the qualitative characteristics of financial information, in particular reliability, comparability, transparency and informativeness, based on both theoretical analysis and empirical evaluation of financial statements.

Materials and Methods

The study was of a theoretical and analytical nature and covered the time frame of 2024-2025, which was due to the need to combine a conceptual analysis of the updated provisions of IFRS for SMEs with an assessment of their practical impact on the financial performance of the enterprise. The selected period is associated with the implementation of the updated version of IFRS for SMEs in 2025, which allowed for a comparative analysis of financial reporting before and after changes to the standard in order to establish cause-and-effect relationships between the updates and the transformation of financial indicators. At the first stage, a theoretical analysis of the essence and role of IFRS for SMEs in the formation of financial reporting was carried out using the

method of generalisation of scientific sources and regulatory documents. To determine the functional purpose of the standard, the International Financial Reporting Standards (2018) substantiate the qualitative characteristics of financial information as a theoretical basis for the study, to clarify the impact of the standard on the quality and efficiency of reporting.

Next, a structural and comparative analysis of the provisions of the standard was carried out using the comparison method to identify differences between the full IFRS and IFRS for SMEs and justify their simplified nature. At the same time, a normative analysis of the updated applied sections of the standard (Section 7 "Statement of Cash Flows", Section 10 "Accounting Policies, Estimates and Errors", Section 22 "Liabilities and Equity", Section 29 "Income Tax", Section 30 "Foreign Currency Translation", and Section 33 "Related Party Disclosures") was carried out using IFRS for SMEs (2025). This was done to identify changes in approaches to recognition, measurement and disclosure and their potential impact on financial reporting.

The assessment of the conceptual impact of changes on the qualitative characteristics of financial information was carried out using the logical generalisation method. Additionally, the comparison method was used to analyse previous and updated approaches to accounting using IFRS 16 Leases (2016), which allowed identifying typical distortions of financial information. Their systematisation was carried out using generalisation and grouping methods involving C. Honigsberg (2024) and IASB (2021). This was necessary to substantiate the role of the updated standards in increasing the reliability and completeness of financial information. The next stage was the analysis of the transparency of financial reporting and information asymmetry using the method of theoretical analysis and scientific generalisation. The International Financial Reporting Standards (2018) was used to determine the relationship between transparency and the qualitative characteristics of financial information and the role of disclosure as a key mechanism for ensuring it. The transparency of financial reporting and information asymmetry was analysed using the methods of theoretical analysis and scientific generalisation. This allowed substantiating the role of updated disclosure requirements in increasing the transparency of financial reporting and reducing information asymmetry between market participants.

HECOTEC (n.d.) and Azerişıq ASC (n.d.) were selected for practical analysis, since the activities of the first company allow to illustrate the impact of the updated requirements for foreign exchange transactions and related party disclosures in the context of the implementation of long-term projects, while the financial statements of the second company contain indicators necessary to assess the potential impact of the updated provisions on income tax, foreign exchange transactions and disclosures in financial statements.

To assess the potential impact of the updated provisions of Section 10 "Accounting Policies, Estimates and Errors", Section 30 "Foreign Currency Translation" and Section 33 "Related Party Disclosures", a case study method was applied to the activities of HECOTEC (2026). The analysis was carried out on the basis of open information about the company's activities in the field of Engineering, Procurement and Construction, the use of project management systems, control of work performance and preparation of project reporting. The case analysis method was used to compare the features of the implementation of long-term projects, the company's participation in the Absheron gas condensate field development project and interaction with SOCAR (n.d.) Oil and Gas Construction Trust with the requirements of the updated provisions of the standard in order to assess their potential impact on the reflection of foreign exchange transactions and the disclosure of information about economically significant relationships with counterparties (Pauley & Newbold, 2025). To assess the potential impact of the updated provisions of Section 10 "Accounting Policies, Estimates and Errors", Section 22 "Liabilities and Equity", Section 29 "Income Tax", Section 30 "Foreign Currency Translation" and Section 33 "Related Party Disclosures", a case analysis method was applied based on the audited financial statements of Azerişıq ASC (2025). The analysis was carried out by comparing the requirements of the relevant sections of the International Financial Reporting Standards for Small and Medium-sized Enterprises (IFRS for SMEs, 2025), changes in these requirements, related financial statement items, financial indicators of the enterprise, potential risks of information distortion before the standard update, expected consequences after the update and their possible impact on management decisions in order to assess the impact of the updated provisions of the standard on the quality, transparency and comparability of financial reporting.

Results

Theoretical foundations and evolution of the updated provisions of IFRS for SMEs

IFRS for SMEs are a simplified version of the full set of IFRS, developed by the International Accounting Standards Board to provide an accessible, understandable and effective tool for preparing financial statements for entities that do not have public accountability. They are aimed at enterprises that do not publicly offer securities and are not financial institutions, but at the same time require a unified approach to accounting and reporting to ensure trust from users of information. The main goal of implementing IFRS for SMEs is to improve the quality of financial information while reducing the complexity of accounting procedures and the costs of preparing reports (Koppeschaar, 2012). The structure of the standard is built on the principle of thematic sections that cover the key elements of financial reporting, including

recognition, measurement, presentation and disclosure of information on assets, liabilities, income and expenses. Unlike full IFRS, the standard for SMEs provides for a significant reduction in alternative accounting methods, simplification of disclosure requirements and limitation of the use of complex assessments, such as fair value, in cases where it is not critically necessary. This allows enterprises with limited resources to more effectively apply international accounting approaches without excessive administrative burden (International Financial Reporting Standards, 2018).

A characteristic feature of IFRS for SMEs is the focus on the needs of the main users of the financial statements of such enterprises, in particular owners, creditors, investors and other interested parties who do not have the opportunity to obtain internal information directly. In this context, the standard ensures the formation of financial statements that are understandable, reliable, relevant and suitable for making economic decisions. Particular attention is paid to ensuring a balance between the quality of information and the costs of obtaining it, which is critically important for small and medium-sized enterprises. The role of IFRS for SMEs in the formation of financial reporting is to create a single methodological basis that helps to increase the comparability of financial indicators between enterprises of different countries and economic environments. Due to the unification of accounting approaches, the level of information asymmetry is reduced, which, in turn, increases the confidence of users in financial reporting. In addition, the application of the standard helps to improve enterprises' access to financial resources, since transparent and understandable reporting facilitates the assessment of their financial condition by creditors and investors. At the same time, the implementation of IFRS for SMEs also has certain challenges related to the need to adapt national accounting systems, improve staff qualifications and ensure an appropriate level of methodological support. Despite the simplified nature of the standard, its effective application requires appropriate knowledge and practical skills, which may be a limitation for enterprises in countries with an insufficient level of professional infrastructure development. However, in general, IFRS for SMEs play a key role in harmonizing financial reporting, improving its quality, and ensuring greater transparency of the activities of small and medium-sized enterprises in the global economic environment (Abdinur & Karcioglu, 2025).

The updates to the applied sections of the IFRS for SMEs (2025) have a systemic conceptual impact on the qualitative characteristics of financial information, as they are aimed at increasing its usefulness for users to make economic decisions. According to the International Financial Reporting Standards (2018), financial information is useful if it provides the fundamental characteristics – relevance and reliable presentation, as well as the enhancing characteristics – comparability, verifiability, timeliness and understandability. In this context, the changes in sections 7 "Statement of Cash Flows", 10 "Accounting Policies, Estimates and Errors", 22 "Liabilities and Equity", 29 "Income Tax", 30 "Foreign Currency Translation" and 33 "Related Party Disclosures" form a complex impact on all of the above characteristics. First of all, the relevance of financial information increases due to the clarification of presentation, recognition and disclosure requirements. In particular, the updated provisions of section 7 "Statement of Cash Flows" improves the usefulness of financial information by providing a more comprehensive view of liquidity management, financing activities and cash flow generation. At the same time, section 10 strengthens the relevance of reporting through expanded disclosure of significant accounting estimates, management judgements and corrections of prior-period errors, allowing users to better assess the assumptions underlying financial statements. Changes in section 22 "Liabilities and Equity" contribute to a more consistent presentation of financial position by clarifying the classification of liabilities and equity instruments, thereby improving the analytical value of solvency and capital structure indicators. The fair presentation of financial information is enhanced by clarifying measurement methods and expanding disclosures about assumptions and accounting judgments. The update of section 29 "Income Tax" contributes to a more complete reflection of deferred tax assets and liabilities, which allows taking into account the future tax consequences of business transactions. At the same time, the expansion of disclosure requirements for transactions with related parties (section 33) provides a more complete and neutral presentation of financial results, reducing the possibility of their distortion. In this case, taking into account the uncertainty of estimates plays an important role, since financial reporting is largely based on assumptions and calculations, which does not reduce its usefulness provided that the relevant information is properly disclosed. The comparability of financial information is significantly improved by harmonising IFRS for SMEs with full IFRS and unifying accounting approaches. In particular, the clarification of the rules for accounting for foreign exchange transactions (section 30) provides a more consistent reflection of exchange rate differences, which allows comparing the financial results of enterprises operating in different currency environments. The verifiability of information is increased by detailing the disclosure requirements and formalising the valuation approaches. This creates an opportunity for independent users, in particular auditors, to confirm the correctness of the reflection of transactions. Timeliness of information is ensured by simplifying individual procedures and reducing alternative accounting approaches, which reduces the time for preparing reports. Clarity, in turn, is increased due to a clearer structure of requirements and the logic of presenting information. An important aspect is also limiting the costs of forming financial

information, since the introduction of new requirements is accompanied by both an increase in the quality of reporting and a potential increase in the costs of its preparation. However, the general direction of the updates is to achieve a balance between the benefits of improving the quality of information and the costs of its formation, which corresponds to the concept of cost constraint.

The updates to IFRS for SMEs in 2025 provide for the improvement of approaches to the formation of financial reporting by clarifying the requirements for recognition, measurement and disclosure of information. It has been established that changes in the applied sections of the standard have a systemic impact on the qualitative characteristics of financial information, in particular relevance, reliability and comparability. Aligning the provisions of IFRS for SMEs with full IFRS contributes to increasing transparency of reporting and reducing information asymmetry. At the same time, the effectiveness of implementing the updates depends on the level of preparation of enterprises and requires further research in different institutional settings.

Impact of updated IFRS for SMEs on reporting quality

The updates to the IFRS for SMEs application sections in 2025 have a systemic impact on the reliability and completeness of financial information, as they eliminate structural distortions characteristic of previous accounting approaches. According to the International Financial Reporting Standards (2018), a reliable presentation implies completeness, neutrality and the absence of material errors, and it is completeness that ensures the inclusion of all information necessary for an understanding of the economic substance of transactions. In this context, the updated requirements for recognition, measurement and disclosure are aimed at eliminating the understatement of liabilities, assets and risks, which previously led to a distortion of financial reporting. The most significant impact of the changes is manifested in the reflection of liabilities, which were systematically understated under previous standards. In particular, the lack of requirements for capitalisation of lease transactions led to the failure to reflect a significant part of the liabilities in the balance sheet, which underestimated their volume by 27-32% in enterprises with a high share of leases (IFRS 16 Leases, 2016). Recognition of income without taking into account the fulfilment of obligations under contracts also led to premature recognition of revenue and an underestimation of contractual obligations. A systematisation of key misstatements of financial information without the application of updated standards is provided in Table 1.

Table 1. *Major misstatements of financial statements without applying the updated standards*

Category	Element	Cause of distortion	Impact on financial reporting
Liabilities	Lease obligations	Recognised off-balance sheet	Understatement of liabilities by 27-32%, distortion of leverage ratios
	Credit losses	Recognition based only on incurred losses	Underestimation of credit risk and reduced reliability of future cash flow assessment
	Contract liabilities	Absence of performance obligation model	Premature revenue recognition, understatement of liabilities
Assets	Intangible assets	Research and Development, brands and software expensed immediately	Understatement of assets, artificially inflated return on assets
	Data and human capital	Not recognised as assets	Limited reflection of knowledge-based resources in financial reporting
Equity	Fair value measurement	Use of historical cost instead of fair value	Understatement of equity and investment performance
Risk exposure	Derivatives and off-balance sheet entities	Lack of fair value measurement and consolidation	Hidden financial risks and obligations

Source: *compiled by author based on IFRS 16 Leases (2016), C. Honigsberg (2024), IASB (2021)*

The presented data demonstrate that the absence of updated accounting requirements leads to systematic distortions in financial reporting, primarily through the understatement of liabilities, assets, and risk exposure. Such distortions reduce the completeness of financial information and undermine faithful representation, as key economic elements remain unrecognised or insufficiently disclosed. The implementation of updated IFRS for SMEs provisions eliminates these inconsistencies by ensuring recognition based on economic substance and enhancing disclosure requirements. As a result, financial statements become more complete, reliable, and suitable for informed decision-making by stakeholders.

The updated sections of the IFRS for SMEs (2025) address these distortions by introducing clearer recognition and measurement rules. The completeness of financial information is significantly enhanced by expanding disclosure requirements, in particular regarding related parties, risks and contingent liabilities. This ensures the reflection of not only formal indicators, but also the economic context of the enterprise's activities, including potential future obligations and sources of risks. Disclosure of risk information allows to assess the variability of future cash flows, and information about related parties allows to identify transactions that may affect the objectivity of financial results. At the same time, the increasing

role of estimates, in particular when determining fair value or expected losses, increases the level of subjectivity in financial reporting. However, the modern concept of fair presentation takes this factor into account, since it assumes that information can remain reliable even in the presence of uncertainty, provided that assumptions and valuation methods are properly disclosed. Thus, the updated standards form a more complete and objective reflection of economic reality, ensuring an increase in the quality of financial information and its suitability for making management and investment decisions.

Transparency of financial reporting is not defined as a separate category in the International Financial Reporting Standards (2018), but is considered as a result of the application of its key principles, in particular qualitative characteristics and disclosure requirements. It is formed by ensuring relevance and reliable presentation of information, and is also enhanced by such characteristics as comparability, verifiability, timeliness and understandability. At the same time, the main mechanism for achieving transparency is disclosure, which allow users to get a complete picture not only of the formal indicators of financial reporting, but also of the economic essence of business transactions. In this context, the updates to the IFRS for SMEs in 2025 are aimed at increasing transparency by expanding and clarifying the requirements for disclosure, which directly affects the reduction of information asymmetry between market participants (Mohammadi & Moein Nezhad, 2015).

Information asymmetry arises from unequal access to information between different groups of users, in particular between management and external investors, borrowers and creditors, as well as between more and less informed market participants. The management of the enterprise has internal information about the financial condition, risks and development prospects, while external users are forced to rely exclusively on published financial statements. This situation can lead to inefficient decisions, an increase in the cost of capital and a distortion of the market valuation of enterprises (Wittenberg-Moerman, 2006). That is why increasing transparency through disclosure is considered a key tool for reducing information asymmetry. The updated IFRS requirements for SMEs significantly expand the scope of information to be disclosed, especially in the areas of financial risks, and transactions with related parties. A summary of the key changes is given in Table 2.

Table 2. *Key disclosure enhancements in IFRS for SMEs and their impact on transparency*

Section	New disclosure requirement	Transparency impact
Section 7 – cash flows	Reconciliation of financing liabilities and supplier finance disclosures	Identifies hidden financing and liquidity pressures
Section 10 – accounting policies, estimates and errors	Expanded disclosure of significant accounting estimates, management judgements and corrections of prior-period errors	Improves understanding of assumptions used in financial reporting and increases reporting reliability
Section 22 – liabilities and equity	Clarified classification and presentation requirements for liabilities and equity instruments	Enhances understanding of capital structure and improves comparability of financial position indicators
Section 30 – foreign currency translation	Enhanced disclosures regarding foreign currency transactions, exchange differences and currency-related exposures	Improves transparency of currency risks and the effects of exchange-rate fluctuations on financial performance
Section 33 – related parties	Disclosure of commitments, key management services and control relationships	Exposes hidden transactions and conflicts of interest

Source: *compiled by author based on International Financial Reporting Standards (2018), D. Dawkins Brown (2025), IFRS for SMEs (2025)*

As can be seen from the table, the updated IFRS for SMEs requirements place greater emphasis on the transparency of financing activities, accounting estimates, capital structure, foreign currency transactions and relationships with related parties. The enhanced disclosure requirements improve the completeness and clarity of financial information, facilitate the assessment of financial risks and sources of financing, and contribute to reducing information asymmetry between enterprises and users of financial statements. As a result, the updated provisions strengthen the reliability, transparency and comparability of financial reporting.

A special role in reducing information asymmetry is played by the expansion of requirements for the disclosure of transactions with related parties. Such transactions may be carried out not on market terms, which create a risk of distortion of financial results due to hidden transactions or conflicts of interest. New requirements, in particular regarding the disclosure of liabilities and remuneration of key management personnel, allow identifying such transactions and providing a more objective assessment of the enterprise's activities. Disclosure of risk information also significantly affects the assessment of future cash flows, as it allows you to move from a static assessment of financial indicators to an analysis of their variability. The availability of detailed information on credit, liquidity and market risks allowsers to assess the probability of deviation of actual results from forecasts, which increases the validity of investment and credit decisions. Empirical studies confirm that the expansion of disclosure leads to a decrease in information asymmetry, which is manifested in

a decrease in spreads between purchase and sale prices, increased market liquidity and a decrease in the cost of capital (Campbell *et al*., 2020). At the same time, IFRS for SMEs maintain a balance between transparency and information overload by reducing secondary disclosures and focusing on the most relevant aspects. This ensures an increase in the informativeness of financial reporting without excessively complicating its structure. Thus, the updated disclosure requirements contribute to the formation of more transparent financial reporting, reducing information asymmetry and increasing the efficiency of economic decision-making by users.

Practical consequences of implementing changes for SMEs and their impact on financial performance

HECOTEC (n.d.) is an Azerbaijani company operating in the field of Engineering, Procurement and Construction and implementing projects in the water, energy and oil and gas sectors. The company provides engineering design, project management, procurement, construction works, quality control and inspection services. According to available open data, the annual turnover of HECOTEC LLC is about USD 1.71 million, and the activities are focused both on the domestic market of Azerbaijan and on further expansion of its presence in regional and international markets. The company's feature is the use of modern project management systems, in particular, the development of detailed work schedules in Primavera P6, the construction of S-curves, progress analysis using the Earned Value Management method, the preparation of regular reporting on project implementation and constant monitoring of deviations from approved plans. The company also declares the principles of transparency, accountability and the use of international project management standards, which creates increased requirements for the quality of financial information and its consistency with actual project implementation and management processes. The most significant impact on the company's activities may be associated with the updated requirements of Section 10 "Accounting Policies, Estimates and Errors". Since HECOTEC LLC specialises in the implementation of engineering and construction projects that often extend over several reporting periods, the preparation of financial information requires the application of significant accounting estimates, assumptions and professional judgements. The company's use of systems for measuring project progress, detailed schedules, S-curves and Earned Value Management analysis creates a structured basis for assessing project implementation, monitoring deviations from planned indicators and supporting managerial decision-making. The updated requirements of IFRS for SMEs place greater emphasis on the disclosure of significant accounting estimates and judgements applied in the preparation of financial statements, thereby increasing the transparency of information provided to users. Enhanced disclosure of accounting policies, estimation techniques and management assumptions allows users of financial statements to better understand the factors influencing reported financial results and project performance. For enterprises operating in the Engineering, Procurement and Construction sector, where project implementation is often accompanied by uncertainty regarding costs, timing and resource allocation, such disclosures improve the reliability and comparability of financial information. This approach contributes to a more transparent presentation of project-related activities and provides additional support for project control, resource management and financial planning (Pauley & Newbold, 2025).

The updated provisions of Section 30 "Foreign Currency Translation" can also be considered in the context of HECOTEC LLC's activities. The company notes that it uses international project management standards, pays attention to transparency and accountability, and also applies modern tools and methodologies to monitor project progress and support management decisions. In such conditions, the correct reflection of exchange rate differences becomes important for ensuring the reliability of financial information. According to the updated requirements of IFRS for SMEs, monetary assets and liabilities denominated in foreign currency are subject to revaluation at the rate at the reporting date with the exchange rate differences reflected in the financial result. This approach provides a more consistent reflection of the impact of currency fluctuations on financial indicators and increases the transparency of information used to control projects and make management decisions. The practical aspects of applying the updated requirements of Section 33 "Related Party Disclosures" can be illustrated by the example of HECOTEC LLC's participation in the implementation of the Absheron gas condensate field development project in the Caspian Sea (International Financial Reporting Standards, 2025). Open information indicates that the company operates as an independent private enterprise with no publicly identified subsidiaries or parent structures. At the same time, HECOTEC (2026) participated in the project as a subcontractor of SOCAR (n.d.) Oil and Gas Construction Trust, providing project management support, planning and reporting on its implementation, technical change management, preparation of construction management documentation, quality control and compliance with Health, Safety and Environment requirements. Under such conditions, expanding the requirements for disclosure of information about economically significant relationships allows users of financial statements to obtain a more complete picture of the nature of cooperation between project participants, the degree of dependence on individual customers and the potential impact of such relationships on the financial results of the enterprise. More detailed disclosure of information about contractual relationships, obligations of the parties and the role of management in the implementation of joint projects helps reduce information asymmetry, increases the transparency of the

control structure and provides a more objective assessment of the risks associated with the concentration of contracts on individual counterparties.

Also, the available audited financial statements of Azerişıq ASC (2025) for 2024 were used. Azerişıq ASC is the state-owned electricity distribution system operator in Azerbaijan and is responsible for the operation, modernisation and development of the country's electricity distribution infrastructure. The scale of the company's operations results in significant amounts of receivables, tax liabilities, long-term investments and transactions related to government regulation, making the company a suitable case study for assessing the potential impact of the updated IFRS for SMEs.

According to the results of 2024, Azerişıq ASC's revenue amounted to AZN 1,710.4 million, net profit – AZN 15.6 million, total assets – AZN 3,620.7 million, equity– AZN 2,779.1 million, and total liabilities – AZN 841.6 million. In addition, deferred tax liabilities in the amount of AZN 98.2 million were reflected in the structure of liabilities, and total income tax expenses amounted to AZN 15.7 million. The cash flow statement also reflected the impact of exchange rate changes on the cash balance in the amount of AZN 616 thousand, which confirms the presence of a currency factor in the financial activities of the enterprise. The presence of these items allows to assess the potential impact of individual updated sections of IFRS for SMEs on the quality and transparency of the enterprise's financial reporting. Unlike the approach limited to comparing indicators before and after the implementation of the standard, the updated requirements directly affect the procedure for recognition, measurement and disclosure of information, which changes the economic content of individual indicators and increases their informativeness for reporting users. To systematise the impact of individual updated sections of IFRS for SMEs on the financial reporting of Azerişıq ASC, it is advisable to compare the changes in the requirements of the standard with the relevant financial reporting items, the enterprise's financial indicators and their potential impact on management decisions (Table 3).

Table 3. *Potential impact of the updated IFRS for SMEs provisions on the financial statements of Azerişıq ASC*

IFRS for SMEs section	Change in requirements	Financial statement item	Azərişıq ASC financial indicator (2024)	Potential risk of misstatement before the update	Expected effect after the update	Impact on management decisions
Section 10 Accounting Policies, Estimates and Errors	Expanded disclosure of significant accounting estimates, management judgements and corrections of prior-period errors	Impairment losses	AZN 3.0 million	Insufficient transparency regarding assumptions used in estimating asset impairment and financial results	Improved disclosure of estimation methods and management judgements	Better assessment of estimation uncertainty and support for risk management decisions
Section 22 Liabilities and Equity	Clarification of classification and presentation requirements for liabilities and equity instruments	Total liabilities; equity	AZN 841.6 million; AZN 2,779.1 million	Limited comparability and inconsistent presentation of capital structure elements	More consistent classification and presentation of liabilities and equity	Improved assessment of financial position, solvency and capital structure
Section 29 Income Tax	Clarification of the recognition of current and deferred tax assets and liabilities	Deferred tax liabilities; income tax expense	AZN 98.2 million; AZN 15.7 million	Incomplete recognition of future tax obligations	More accurate presentation of tax burden and future tax payments	Support for tax planning and cash flow forecasting
Section 30 Foreign Currency Translation	Consistent remeasurement of monetary items using the closing exchange rate	Effect of exchange rate changes on cash and cash equivalents	AZN 616 thousand	Underestimation of foreign exchange risk and its impact on financial performance	Timely recognition of exchange differences and currency-related risks	Improvement of currency risk management and financial planning
Section 33 Related Party Disclosures	Expanded disclosure requirements regarding relationships and transactions with related parties	Transactions with government-related entities and related parties	Disclosed within the state-controlled operating environment of the entity	Limited transparency of economically significant relationships	Reduction of information asymmetry and greater transparency of the control structure	Better assessment of dependency risks associated with key counterparties and government-related entities

Source: *compiled by author based on International Financial Reporting Standards (2018), IFRS for SMEs (2025), Azerişıq ASC (2025), International Financial Reporting Standards (2025), Income Tax Act (2025)*

The data in Table 3 show that the impact of the updated IFRS for SMEs provisions on the financial statements of Azerişıq ASC is not limited to changes in individual accounting procedures, but extends to the formation of key financial indicators of the enterprise. The most significant impact is related to accounting estimates and judgements, the presentation of liabilities and equity, tax liabilities, foreign exchange transactions and the disclosure of information about related parties. In particular, expanded disclosure of accounting estimates and management judgements contributes to greater transparency regarding impairment assessments and the assumptions underlying financial reporting, which is relevant given the recognition of impairment losses amounting to AZN 3.0 million. Clarified requirements for the classification and presentation of liabilities and equity improve the comparability of financial position indicators and provide a more consistent representation of the enterprise's capital structure, reflected in total liabilities of AZN 841.6 million and equity of AZN 2,779.1 million. At the same time, the clarification of the procedure for recognising current and deferred tax assets and liabilities contributes to a more accurate reflection of the tax burden, which is confirmed by the presence of deferred tax liabilities amounting to AZN 98.2 million and income tax expenses of AZN 15.7 million. Updated requirements for the translation of monetary items in foreign currency ensure the timely recognition of exchange rate differences and improve the reliability of currency risk assessment, which is particularly important given the recorded effect of exchange rate changes on cash and cash equivalents amounting to AZN 616 thousand. In addition, expanded disclosure of information about related parties increases the transparency of the control structure and allows users of financial statements to better assess potential risks associated with economically significant relationships. Thus, the economic effect of the updated IFRS for SMEs provisions is formed through changes in approaches to recognition, presentation and disclosure of information, which, in turn, enhances the reliability of financial indicators, increases the transparency of reporting and improves the information basis for management, investment and credit decisions.

To further illustrate the economic implications of the updated IFRS for SMEs provisions, it is advisable to present the sequence through which changes in recognition, measurement, and disclosure requirements affect financial statement indicators and, consequently, the decisions of financial statement users (Fig. 1). So, the impact of the updated IFRS for SMEs requirements extends beyond individual accounting procedures and affects the overall quality of financial reporting. Changes in recognition, measurement, and disclosure approaches lead to adjustments in financial statement items and key performance indicators, resulting in more reliable, transparent, and comparable financial information. Consequently, users of financial statements obtain a more accurate basis for assessing financial position, performance, risks, and future prospects, which contributes to more informed managerial, investment, and lending decisions. The examples of HECOTEC LLC and Azərişıq ASC indicate that the practical effect of the updated requirements is manifested through improved assessment of tax obligations, foreign currency exposure, and economically significant relationships with related parties.

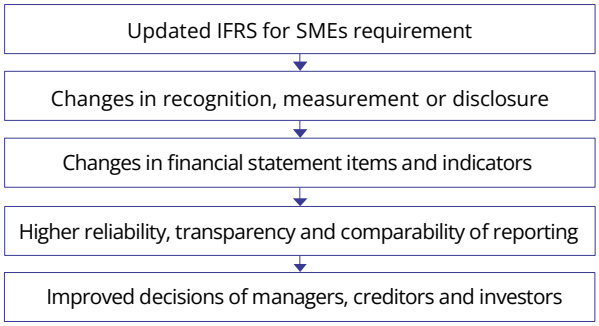

Figure 1. *Mechanism of the impact of updated IFRS for SMEs requirements on financial reporting quality*
Source: *compiled by the author based on IFRS for SMEs (2025)*

Discussion

In the context of economic globalisation, improving the quality of financial reporting has become particularly important for ensuring the transparency of enterprises and trust from information users. The introduction of international financial reporting standards was considered a key tool for harmonising accounting and reducing information asymmetry. A comparison with the study by O.S. Shaban & A. Omoush (2025) logically continued the idea that the quality of financial information is a key factor in reducing information asymmetry. If in this work this effect was achieved through updating IFRS for SMEs and eliminating specific distortions (understating liabilities by 27-32%), then O.S. Shaban & A. Omoush demonstrated a different mechanism through the use of artificial intelligence, which had a positive impact on corporate governance, risk management and interaction with stakeholders. Thus, both approaches converged in the result, but differed in the tools: regulatory changes versus technological solutions. This logic was reinforced in comparison with the study by B. Gardi *et al.* (2023), where IFRS were considered as a connecting link between corporate governance and reporting quality. In contrast to the generalised empirical analysis presented by B. Gardi *et al.*, this work specified this connection, demonstrating how changes in the standard transform enterprise performance. Thus, if the study by B. Gardi *et al.* explained why such transformations occur, this study explained how they manifest themselves in practice. A similar evolution could be traced in comparison with the study by I. Naeem (2024). This approach remained mainly theoretical, emphasising IFRS as a universal language

of financial reporting, while this work supplemented these provisions with empirical content through the analysis of real financial changes. In contrast, the study by S. Bathla *et al.* (2024) broadened the context by showing how scholarly interest in IFRS evolved over time, allowing the results of this work to be seen as part of a broader scholarly trend.

A more critical perspective was offered by R. Warren (2024), who viewed IFRS not only as a technical tool but also as an element of economic power. Against this background, the results of this study appeared more pragmatic, focusing on the practical benefits of standards for enterprises. A similar balance between theory and practice was also observed in the work by H. Kabir (2026), who analysed the standardisation process itself, while this work analysed its consequences. The results of previous studies did not provide grounds for an unambiguous conclusion about the universally positive impact of IFRS. In particular, I.E. Ebaid (2024) found a limited statistical effect of their implementation, which differed from the results of this study, where improvements in financial indicators after the update of IFRS for SMEs were identified. Similar ambiguity was observed in the studies by A.D. Adekanmi *et al.* (2021) and S. Rathnayake *et al.* (2021), in which the effectiveness of the standards or their relationship with enterprise performance was not sufficiently confirmed. This indicated the dependence of the impact of IFRS on the institutional environment, research methodology and conditions of practical application of the standards. In contrast, the studies by J.Y. Yeap & S.M. Shabri (2023) and N.N. Jamil (2021) allowed understanding the prerequisites of these differences, focusing on institutional factors and characteristics of reporting quality. As a result, unlike these works, which focused on the conditions or models of implementation, this study demonstrated the ultimate effect of IFRS implementation through increasing the reliability, transparency and analytical value of financial reporting.

In the study by S.F. Zainal *et al.* (2024), the quality of financial reporting was considered not through the prism of standards, but through the internal environment of the enterprise. The authors showed that the transparency and reliability of SME reporting depended on ethical culture, including formal and informal rules, leadership and religious values. This echoed the present study, which also emphasised the need to increase trust in financial information. However, the mechanism for achieving this goal differed: in the study by S.F. Zainal *et al.*, the emphasis was placed on behavioural and organisational factors, while this work focused on updating IFRS for SMEs, eliminating distortions and improving enterprise performance. Another perspective was proposed by T. Dănescu & R.M. Stejerean (2022), who linked the quality of financial reporting to the broader economic context, particularly pre-crisis and post-crisis conditions. Their study showed that the level of reporting quality could vary depending on the market segment and the influence of macroeconomic factors. In contrast, this work focused not on external crisis conditions, but on regulatory changes in IFRS for SMEs. The common understanding remained that reliable, relevant and comparable information forms the basis for management and investment decision-making, but T. Dănescu & R.M. Stejerean analysed market behaviour at the company level, whereas this work demonstrated the applied effect of standards within enterprise reporting practice.

Closer to the topic of this study was the research by E.E. Alharasis *et al*. (2024), as it also assessed the impact of IFRS on the quality of financial reporting. The authors proved that the implementation of IFRS 7 had a positive impact on the relevance, fair presentation, comparability and timeliness of reporting, although it did not significantly affect its understandability. This was partly consistent with the results of this study, where the update of IFRS for SMEs contributed to increasing the transparency and reliability of financial information. At the same time, E.E. Alharasis *et al*. worked with banking sector data and used quantitative methods, while this study had a micro-level focus and concentrated on the practical analysis of the reporting of an individual enterprise. The study by N.N. Jamil & S.N. Rosli (2021) complemented this block of research, as it considered the quality of SME reporting through a conceptual model of the impact of MPERS based on IFRS for SMEs. The authors emphasised the importance of relevance and timeliness of information, i.e., the characteristics that in this study were also considered as a result of improving standards. However, N.N. Jamil & S.N. Rosli remained mainly at the level of theoretical justification, while this study moved to applied verification through the analysis of real financial data, identification of distortions and assessment of the impact of the updated IFRS for SMEs on enterprise financial performance.

Particular attention to the practical difficulties of implementing standards was paid by E. Ortiz-Martínez *et al.* (2022). Their study showed that the harmonisation of accounting with IFRS not only improved the comparability of reporting, but also complicated professional practice by requiring additional training of specialists. This is important for interpreting the results of this study, because even though the update of IFRS for SMEs provided a positive effect, its implementation required enterprises to adapt to new rules. Thus, E. Ortiz-Martínez *et al.* focused on the perception of changes by the professional community, while this study focused on the economic consequences of such changes in reporting. Similar issues, but in the Namibian context, were considered by D.W. Kamotho & P.K. Kaudo (2023). Their results showed that SMEs did not fully apply IFRS due to a lack of qualified accountants, high costs, insufficient staff training and reluctance to disclose financial information. Against this background, this study

demonstrated another aspect of the issue: not barriers to implementation, but the consequences of effective application of the updated standards. Therefore, these studies did not contradict each other, but rather reflected two stages of the same process: D.W. Kamotho & P.K. Kaudo described the difficulties of transition, while this study demonstrated the potential outcomes of such a transition.

The study by S.Z. Msechu *et al.* (2024) also confirmed that the formal existence of standards did not guarantee high-quality reporting. The authors found that the level of compliance with IFRS for SMEs in Tanzania remained relatively low, and compliance depended on enterprise size, age, profitability and auditor type. This allowed a broader interpretation of the results of this study: the positive impact of the updated IFRS for SMEs was possible only if the standards were properly applied. While S.Z. Msechu *et al.* focused on compliance factors, this study demonstrated how compliance with updated provisions changed the quality and analytical value of reporting. On the other hand, E.H. Turner & C.M. Wheatley (2024) drew attention to the fact that IFRS implementation could produce ambiguous consequences. Using the example of the integration of IFRS, the authors showed partial convergence of indicators, but also identified increased volatility and tax burden. This differed from the findings of this study, where the update of IFRS for SMEs was mainly assessed positively because it contributed to eliminating distortions and increasing liquidity, income and equity. Thus, E.H. Turner & C.M. Wheatley emphasised the value of comparability, whereas this study emphasised its practical benefits. In the study by I. Benhayoun & I. Zejjari (2024), attention shifted to the pre-transition stage, when IFRS for SMEs had not yet been implemented. The authors analysed factors influencing the readiness of Moroccan enterprises to adopt the standards, particularly industry characteristics, implementation methods, organisational factors and individual characteristics. In this context, this study appeared to be a logical continuation of that approach: while I. Benhayoun & I. Zejjari investigated the prerequisites for implementation, this study assessed the results after applying the updated provisions of IFRS for SMEs. The final generalisation was presented in the study by L. Judijanto & N.Y. Renggaala (2024), in which the impact of IFRS on financial reporting quality was examined through a bibliometric analysis of scientific publications. The authors demonstrated growing scholarly interest in this topic and identified key research directions related to earnings quality, audit and fair value. In contrast, this study did not describe the global scientific landscape, but instead deepened one of its practical directions by analysing the impact of updated IFRS for SMEs on actual enterprise performance. Thus, Judijanto & N.Y. Renggaala outlined the general development of research, while this study specified its applied dimension.

The generalisation of the research results showed that the update of IFRS for SMEs contributed to increasing the transparency, reliability and comparability of financial information. It was found that the elimination of distortions in reporting allowed a more objective reflection of the financial condition of the enterprise and improved its key indicators. At the same time, the effectiveness of the implementation of standards depended on the conditions of their practical application, the institutional environment and the level of personnel training. The results obtained confirmed the feasibility of further improving the standards and adapting enterprises to their requirements.

Conclusions

The generalisation of the results of the study showed that the updates to IFRS for small and medium-sized enterprises had a significant impact on the quality, transparency and comparability of financial reporting. It was found that before the update of the standard, financial statements could contain material misstatements related to incomplete recognition of liabilities, financial risks and contractual obligations. In particular, an analysis of previous accounting approaches showed that the volume of liabilities of enterprises with a high share of lease transactions could be underestimated by 27-32%, which negatively affected the assessment of financial stability and the level of risk. Updated requirements relating to accounting estimates and judgements, liabilities and equity, income tax, foreign currency transactions and related party disclosures provide a more complete reflection of the economic consequences of enterprises' activities and increase the analytical value of financial information.

A practical assessment of the impact of the updated IFRS for SMEs provisions was carried out using the example of HECOTEC LLC and Azerişıq ASC. For HECOTEC, the most significant impact is associated with enhanced disclosure requirements related to accounting estimates and economically significant business relationships, which improve the transparency, reliability and comparability of financial information in long-term Engineering, Procurement and Construction projects. For Azerişıq ASC, an analysis of the 2024 financial statements identified impairment losses amounting to AZN 3.0 million, deferred tax liabilities amounting to AZN 98.2 million, and the effect of exchange rate changes on cash and cash equivalents amounting to AZN 616 thousand. In addition, the company reported total liabilities of AZN 841.6 million and equity of AZN 2,779.1 million, which allowed an assessment of the potential impact of the updated requirements for the presentation of liabilities and equity. These indicators confirm that the updated provisions relating to accounting estimates and judgements, liabilities and equity, income tax, foreign currency translation and related party disclosures directly affect the

reliability, transparency and comparability of financial information and improve its usefulness for management decision-making.

The generalisation of the research results allows to conclude that the updated provisions of IFRS for SMEs are not limited to changing individual accounting procedures, but form a systemic economic effect by increasing the transparency, comparability and reliability of financial reporting. The limitation of the study is that the practical assessment was based on illustrative case analyses of HECOTEC LLC and Azerişıq ASC, which limits the direct generalisation of the results. Further research should expand the empirical base and assess the impact of updated IFRS for SMEs provisions in different institutional and sectoral environments.

Acknowledgements

None.

Funding

None.

Conflict of Interest

None.

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Вплив оновлених розділів МСФЗ для малих та середніх підприємств на якість, прозорість та порівнянність фінансової звітності підприємств

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Анотація. Метою даного дослідження було визначення впливу оновлених положень Міжнародних стандартів фінансової звітності для малих та середніх підприємств на якість, прозорість та порівнянність фінансової звітності. Методологія базувалася на теоретичному, нормативному та порівняльному аналізі оновлених Міжнародних стандартів фінансової звітності для малих та середніх підприємств з використанням аналізу конкретних прикладів. Було встановлено, що до оновлення фінансова звітність могла містити суттєві викривлення, пов'язані з неповним відображенням зобов'язань, які на підприємствах із високою часткою операцій з оренди могли бути занижені на 27-32 %. Результати показали, що гармонізація Міжнародних стандартів фінансової звітності для малих та середніх підприємств із повними Міжнародними стандартами фінансової звітності підвищила надійність та аналітичну цінність фінансової інформації та зменшила інформаційну асиметрію. Було проведено практичну оцінку на прикладі компаній HECOTEC та Azerişıq Açıq Səhmdar Cəmiyyəti. Щодо HECOTEC, оновлені вимоги підвищили прозорість фінансової інформації завдяки розширенню розкриття інформації про бухгалтерські оцінки, судження керівництва та економічно значущі ділові відносини. Аналіз фінансової звітності Азерішік Ачік Сехмдар Джеміеті за 2024 рік виявив збитки від знецінення у розмірі 3 млн манатів, відстрочені податкові зобов'язання у розмірі 98,2 млн манатів, вплив курсових різниць на грошові кошти та їх еквіваленти у розмірі 616 тис. манатів, загальні зобов'язання у розмірі 841,6 млн манатів та власний капітал у розмірі 2779,1 млн манатів. Ці показники продемонстрували практичне значення оновлених вимог щодо підвищення надійності, прозорості та порівнянності фінансової звітності. Отримані результати підтвердили, що оновлені положення підвищили надійність звітності завдяки зменшенню спотворень у відображенні зобов'язань, облікових оцінок, фінансових ризиків та економічно значущих взаємозв'язків

Ключові слова: гармонізація; вимоги до розкриття інформації; інформаційна асиметрія; корпоративне управління; прийняття рішень

Journal
“ECONOMIC FORUM”

Volume 16, No. 2
2026

Managing editor
I. Kravchuk

Signed to the print with the original layout 28.05.2026
Conventional Printed Sheet 9.4
Circulation 100 copies

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Журнал
«ЕКОНОМІЧНИЙ ФОРУМ»

Том 16, № 2
2026

(Англійською мовою)

Відповідальний редактор
І. Кравчук

Підписано до друку з оригінал-макета 28.05.2026
Ум. друк. арк. 9,4
Наклад 100 прим.

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