https://doi.org/10.64211/oidaijsd190601

Obstacles to Digital Bank Service Expansion: Financial Inclusion in Developing Nations

Dmytro Kovalenko [1*], Denis Shcherbatykh [2], Kateryna Yefremova [3], Oleksandr Momot [4], Oleksandr Zinevych [5]

[1] Department of Finance and Business Consulting, Faculty of Management and Business Design, Kyiv National University of Technologies and Design, Kyiv, Ukraine.
[2] Department of Economics, Finance and Accounting, Faculty of Economics and Management, Private Higher Educational Institution "European University", Kyiv, Ukraine.
[3] Department of Financial Law, Yaroslav Mudryi National Law University, Kharkiv, Ukraine.
[4] Department of Economics, Management, Business, Kyiv International University, Kyiv, Ukraine.
[5] Inerregional Academy of Personnel Management, Kyiv, Ukraine.
[*] Correspondence authour: kdi75@ukr.net

OIDA International Journal of Sustainable Development, Ontario International Development Agency, Canada.
ISSN 1923-6654 (print) ISSN 1923-6662 (online) www.oidaijsd.com
Also available at https://www.ssrn.com/index.cfm/en/oida-intl-journal-sustainable-dev/

Abstract: The article examines the essence and role of financial inclusion in ensuring developing countries' economic and social development in the context of the digitalisation of banking services. Based on the methods of analysis and synthesis, as well as the use of financial inclusion indicators and mathematical tools, the article examines theoretical approaches to defining financial inclusion, its components and factors of influence, analyses methodological approaches to assessing financial inclusion, systematises indicators of its assessment with the allocation of two criteria (traditional inclusion and digital inclusion) based on the assessment of the population's access to financial products. An instrumentation for assessing financial inclusion based on the calculation of the relevant index is proposed, which provides an assessment of its status at a certain point in time and development trends in a country, region or separate territory. The trends in the penetration and development of financial inclusion and their features in developing countries by parts of the world and levels of economic development are studied. The financial inclusion indices for individual countries representing different parts of the world and belonging to different categories by the level of per capita income for the period 2014–2022 were calculated and compared with the average Gini index, which allowed us to determine the mutual influence of financial inclusion not only with the level of economic development but also with the distribution of national wealth in countries. The features of the development of digital inclusion at the global level and in the context of groups of countries are studied, and the advantages and risks of digital banking development in modern conditions are systematised.

Keywords: financial inclusion, financial services, financial services market participants, developing countries, digitalisation of banking services, e-banking, risks, financial market, financial market participants, financial instruments, digitalisation of the financial market.

Introduction

Financial inclusion is important to economic growth, social equity and sustainable development, especially in low-income countries. According to World Bank experts, despite the significant growth of financial services in the global environment, a large proportion of poor, vulnerable and marginalised individuals, households, groups and communities in developing countries still lack access to essential formal financial services, such as opening a bank account, paying for goods and services, or sending and receiving remittances [1].

Ensuring access to essential financial services such as credit, insurance, and savings contributes to the development of small businesses [2], job creation, and social inclusion [3] of marginalised groups. In today's environment, the role of digital financial technologies in ensuring financial inclusion is growing, allowing it to reach remote regions and reduce barriers to participation in the formal economy in underdeveloped countries [4]. The digitalisation of banking services offers new opportunities for expanding access to financial products and services [5], but also poses several challenges and risks [6] that need to be addressed to achieve full inclusion. All these aspects determine the relevance of further research on sensitive financial inclusion issues in developing countries to accelerate the opportunities for population integration into economic life, reduce inequality, and address global challenges.

The study aims to outline the role of financial inclusion and analyse its peculiarities in developing countries. It will also identify the main trends in the digitalisation of banking services and assess their role in ensuring financial inclusion. The novelty of the study lies in the systematization of factors that determine financial inclusion and in the creation of a multifactorial index of financial inclusion to enable objective comparison of progress both within countries and in comparison with other countries. Finally, the study will analyze the risks faced by these countries in the process of digital transformation of the financial sector.

Literature review

The concept of financial inclusion today remains one of the key concepts in the context of sustainable development, especially in developing countries, and at the same time is controversial due to the presence of a significant number of factors that affect the level of development of financial markets, their liberalisation and diversification, the efficiency of the use of financial services and products, and their promotion in different countries. The theoretical foundations of financial inclusion are considered in the works of such scholars as Demirgüç-Kunt et al. [2], Taghiyeva [7], Persaud and Thaffe [8], Xie [9], Wang [10], Klochan and Filipov [11], Zolkover et al. [12] and reports of international organisations [3, 13]. Persaud and Thaffe [8] systematised theoretical approaches to defining the essence and components of financial inclusion and developed the "financial inclusion diamond" model (public financial institutions, regulatory mechanisms, financial market participants, financial instruments and products), which identifies key areas for empirical research.

Methodological approaches to assessing financial inclusion are considered in Pesqué-Cela et al. [14], Park and Mercado [15], Demirgüç-Kunt et al. [2]. The researchers analysed the specifics of methodological approaches to assessing financial inclusion at the global and national levels and identified their advantages and disadvantages. The main advantages of different approaches to assessing financial inclusion include a clear identification of the objectives of such an assessment, the possibility of conducting a comparative analysis of financial systems to ensure financial inclusion and the possibility of adapting the mathematical apparatus of the assessment to specific issues. Among the shortcomings, the authors highlight the subjectivity of approaches to ranking indicators, difficulties in collecting and unifying statistical data, and the lack of representativeness of sociological surveys, which creates barriers to practical assessment of financial inclusion in different countries.

The World Bank conducts the most comprehensive assessment of financial inclusion in developing countries. The data are based on direct surveys of the population of different countries in terms of access to financial services and the level of their use in everyday life [16, 17]. The works of Meshcheriakov et al. [18], Persaud and Thaffe [8], Adegbite and Machethe [19], Ojo [20] analyse the development of financial inclusion in countries and regions of the world and determine its impact on economic development, gender equality, small business development, agriculture.

Current trends in the digitalisation of financial services, their benefits and challenges at the global level and by region and country are studied by analytical research organisations [21, 22, 23, 24, 25]. The studies note the impact of digital technologies and artificial intelligence on transformational changes in the financial products and services market and the rapid development of e-banking, especially in developing countries. In the scientific works of various scholars [26, 27, 28, 29, 30] systematised the risks of digitalisation of banking services for both banking institutions (cybersecurity, improper data management, technical failures, low digital literacy of customers, reputational risks) and consumers (personal data leakage, fraudulent schemes, difficulty in resolving disputes, unreliability of mobile applications), and considered ways to prevent and limit them.

Methods

The article analyses the dynamics of financial inclusion in developing countries by parts of the world and income groups using data from analytical portals [16, 17]. Based on the studied approaches to assessing financial inclusion, the indicators for assessing financial inclusion are systematised and grouped into two areas: traditional sources of financial products and services and digital financial products and services that can be used for a comprehensive

assessment at the level of individual countries, population groups or regions. This will allow for analysing the status, dynamics, and structural changes in financial inclusion and identifying gaps.

To assess the level of development of financial services in developing countries, the article proposes a financial inclusion index that allows determining the level of access to financial products and services using a wide range of assessment indicators and taking into account not only current data but also the dynamics of their growth and can be adapted to analyse financial inclusion by individual components that characterise the contribution of various financial market participants to its provision. Using the financial inclusion indicators and mathematical tools, the financial inclusion index was calculated for six countries (Afghanistan, Argentina, Cambodia, Congo, Finland and Georgia), representing different parts of the world and belonging to different groups in terms of per capita income. The choice of countries was random and based on geographical factors. This allowed for a comparative analysis of trends and features of financial inclusion in these countries. The author analysed the correlation of the financial inclusion index in the selected countries with the Gini index, which allowed us to conclude the mutual influence of the level of development and use of financial services and the size of the middle class.

The article analyses the structural and dynamic changes in the global mobile banking market based on data from analytical platforms [17, 22] and the dynamics of its development in different parts of the world, which reflects the peculiarities of digital financial inclusion and its impact on the financial landscape of developing countries.

Results and discussion

The essence and factors of financial inclusion in developing countries

Financial inclusion is currently one of the key tools for sustainable development; in particular, its role is defined in achieving 8 of the 17 UN Sustainable Development Goals [31] namely poverty alleviation, hunger alleviation through farmers' access to cheap development finance, expanding access to healthcare services through liberalisation of their payment, empowering women through access to financial resources, reducing social inequality, expanding opportunities for investment in infrastructure development. That is why the development of financial inclusion in developing countries is an important prerequisite for overcoming global challenges and ensuring the sustainable development of humanity.

Experts from the International Labour Organisation emphasise the role of financial inclusion in developing agricultural production in countries with a predominantly agricultural economy. Scientists argue that today, more than 70% of low-income people live in agricultural areas in developing countries, and only 60% of them have access to financial services. Inclusive financial services play a key role in maintaining and improving living conditions in rural areas [3]. This is especially true for members of vulnerable groups, who are more likely to live below the poverty line and have lower levels of financial resilience.

According to Demirgüç-Kunt et al. [2], financial inclusion is defined and measured through access to and use of formal financial services such as bank accounts, savings, payments, credit, remittances, investments, and financial advice.

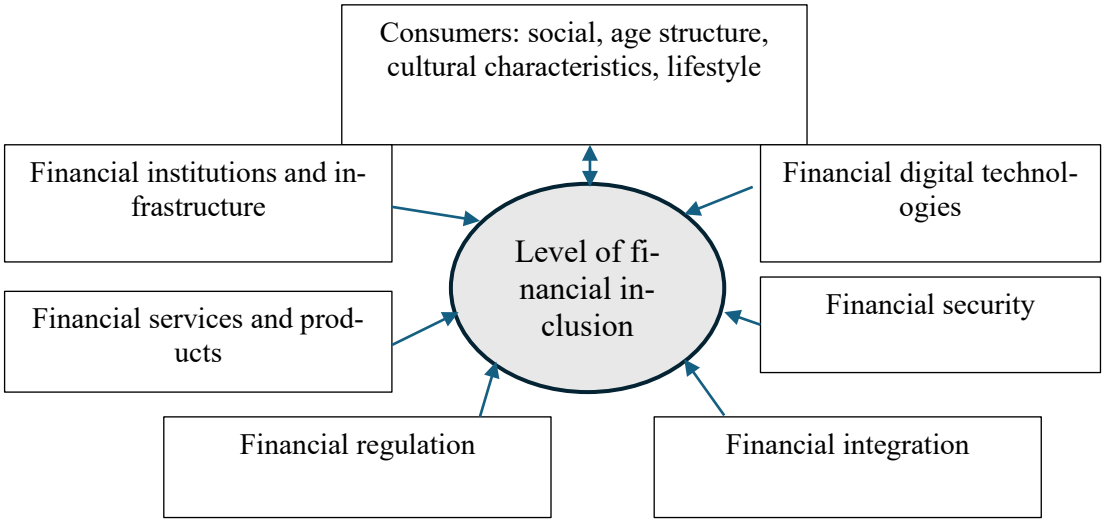
Accessibility is a fundamental pillar of financial inclusion, enabling people and businesses to access and effectively use formal financial services. However, financial costs can be a significant barrier to low-income households and small businesses. In particular, high fees, minimum balance requirements and significant transaction costs often make accessing essential financial products such as bank accounts or mobile banking impossible. This severely limits their participation in the financial system and prevents them from fully benefiting from its advantages [32, 33, 34].

Financial inclusion involves ensuring that individuals and businesses access valuable financial products and services that meet various needs, from savings and credit to financial education and advice. At the same time, these services should be provided responsibly, sustainably and in the interests of users [13].

Persaud and Thaffe [8] identify the following components of the financial ecosystem that form the profile of financial inclusion in a particular country or group of countries: the conceptualisation and impact of financial inclusion on the economy, the perception and acceptance of financial products and services by users, the role of financial innovation and private sector financial institutions, and the role of public institutions and public policy.

Based on the research, the following financial market components can be identified, the level of development and interaction of which affects financial inclusion in each country (Figure 1).

Figure 1: Financial market components that influence the financial inclusion profile of a country, region or territory



Source: Compiled by the author based on [1], [14]

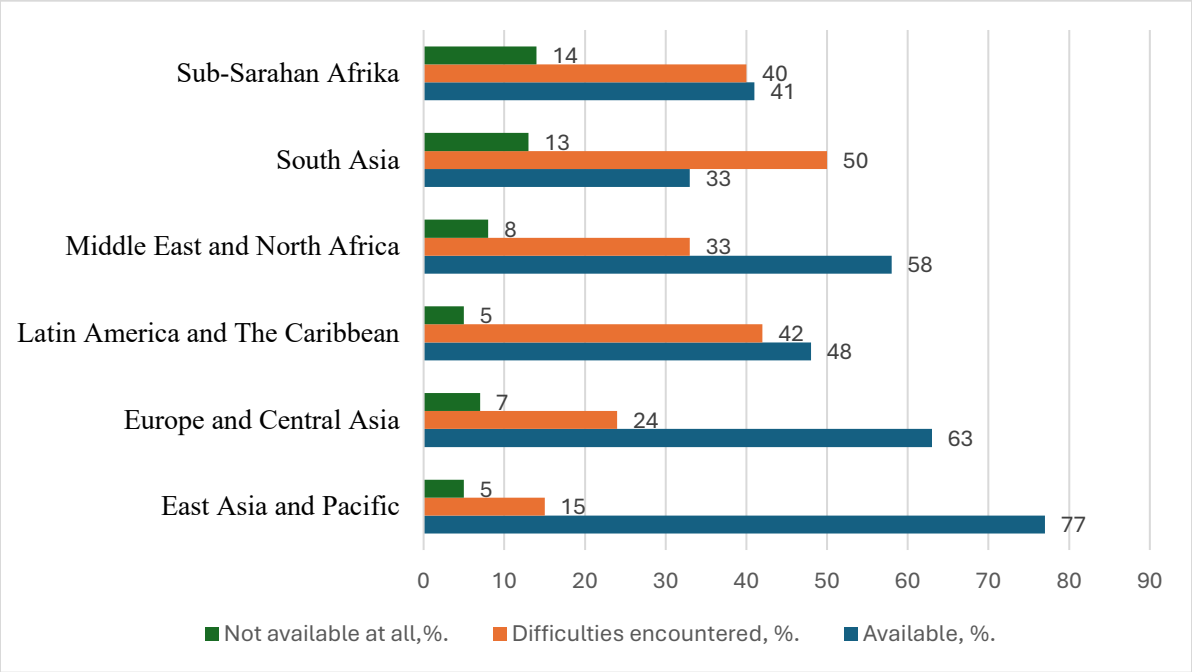
These components of the financial market, in their interconnectedness, not only affect the level of financial services provided to households and businesses but also form the basis for financial inclusion and create conditions for reducing the risks of financial transactions, maintaining the confidentiality of consumer data, and guaranteeing their deposits, which together contribute to the growth of confidence in financial systems and, accordingly, the competitiveness of the economy. Ensuring financial inclusion is a complex task that depends on many interrelated factors and requires a comprehensive approach that includes developing financial infrastructure, improving financial literacy, creating a practical regulatory framework, ensuring the security of financial transactions and consumer protection, and actively developing digital banking.

Trends in financial inclusion in developing countries

The current period is characterised by the dynamic development of the global financial market and, at the same time, its significant transformations under the influence of AI, digital technologies, economic growth in developing countries, increased competition between traditional and innovative forms of financial exchange, globalisation and glocalisation. The World Bank estimates that despite the rapid growth of the global financial services market, more than 1.4 billion people worldwide will be unbanked by the end of 2022. At the same time, the GSMA indicates that 345 million of the 400 million microenterprises in developing countries operate in the informal sector, highlighting a significant gap in the global financial environment [7]. Figure 2 shows the comparative level of emergency money availability in developing countries by significant parts of the world at the end of 2021.

Next Page

Figure 2: Availability of emergency money for the population, %



Source: World Bank [16]

According to the United Nations, micro, small and medium-sized enterprises (MSMEs) account for 90% of all companies in the world, provide more than 70% of jobs and generate about 50% of global GDP. Therefore, it is crucial for them to have access to the resources and tools they need to expand their operations, fulfil larger orders and meet growing demand. Lack of access to financial resources is becoming a serious obstacle, especially for citizens and micro-entrepreneurs, the backbone of emerging economies. These people contribute to economic growth, create jobs and often improve the quality of life in their communities [35].

Researchers [32, 33, 34] identify the high costs of making and maintaining bank accounts for the population, especially in low-income countries, as an important reason for the limited accessibility of banking services. The researchers calculated the index of accessibility of banking services based on their cost to consumers, which consists of the monthly cost of servicing a bank account, bank card fees, and ATM withdrawals.

Based on the research, indicators that can be used to comprehensively assess financial inclusion at the level of individual countries, population groups, or regions were selected (Table 1).

Table 1: Financial inclusion indicators

Name of the indicator	**Designation**	**Characteristics**
Indicators of traditional inclusion		
Financial institution account	(f1)	characterises the level of provision of the population with bank accounts that allow them to effectively conduct financial transactions, receive state and social benefits, store funds, and access loans or other financial instruments
Owns a debit or credit card	(f2)	characterises the population's access to financial services and participation in the modern economy;
Made a withdrawal	(f3)	reflects the level of involvement of the population in the formal financial system and the ability to use banking products

Saved any money	(f4)	indicates access to financial instruments, ability to manage income and plan for the future
Received wages	(f5)	the level of access to formal financial instruments, such as bank accounts for transferring salaries, which facilitates their economic integration
Digital inclusion indicators		
Use the internet to make payments, buy things, or send or receive money using a financial institution account	(f6)	the level of access to digital financial services that facilitate economic interaction and help reduce barriers to the use of financial instruments
Mobile money account	(f7)	demonstrates how widely people can use mobile financial technologies to store funds, make payments, transfers and other financial transactions
Made or received a digital payment	(f8)	access to digital financial instruments and participation in the cashless economy

Source: Compiled by the author according to [1], [16], [15]

The indicators presented in the table are not exhaustive and can be supplemented with others depending on the study's objectives and the availability of statistical data. These indicators can also be selected based on the results of surveys (in % of respondents) and in quantitative terms of per capita statistics.

To study the peculiarities of financial inclusion in developing countries, we selected data for six countries from different parts of the world and different income groups (Table 2).

Table 2: Indicators of accessibility and use of financial services by the population in 2014–2022, in shares of respondents aged 15 and older

Part of the world, income level, country name	**Period**	**f1**	**f2**	**f3**	**f4**	**f5**	**f6**	**f7**	**f8**
South Asia (lower income)	2014	0.10	0.02	-	0.26	0.17	-	0.00	0.06
Afghanistan	2017	0.15	0.03	0.58	0.14	0.18	-	0.01	0.11
	2022	0.10	0.03	-	0.06	0.15	-	0.00	0.08
	Increase	**0.00**	**0.01**	**0.00**	**-0.20**	**-0.02**	**0.00**	**0.00**	**0.02**
Latin America & Caribbean (Upper middle income)	2014	0.50	0.50	0.85	0.23	0.35	-	0.00	0.40
Argentina	2017	0.48	0.47	0.71	0.30	0.33	-	0.02	0.40
	2022	0.66	0.56	0.71	0.39	0.39	0.51	0.35	0.65
	Increase	**0.16**	**0.07**	**-0.15**	**0.16**	**0.05**	**0.51**	**0.35**	**0.25**

East Asia & Pacific (Lower middle income) Cambodia	2014	0.13	0.07	0.38	0.67	0.28	-	0.13	0.18
	2017	0.18	0.08	0.39	0.52	0.31	-	0.06	0.16
	2022	0.33	0.15	0.42	0.32	0.29	0.15	0.07	0.26
	Increase	**0.20**	**0.07**	**0.05**	**-0.35**	**0.01**	**0.15**	**-0.07**	**0.08**
Sub-Saharan Africa (Low income) Congo, Dem. Rep.	2014	0.11	0.05	0.61	0.65	0.16	-	0.09	0.15
	2017	0.15	0.07	0.49	0.39	0.14	0.05	0.16	0.22
	2022	0.10	0.09	0.49	0.28	0.14	0.10	0.18	0.26
	Increase	**-0.01**	**0.04**	**-0.12**	**-0.37**	**-0.03**	**0.10**	**0.09**	**0.10**
Europe & Central Asia (Upper middle income) Georgia	2014	0.40	0.40	0.91	0.13	0.21	-	-	0.24
	2017	0.61	0.44	0.70	0.15	0.25	0.12	0.02	0.53
	2022	0.70	0.46	0.65	0.24	0.30	0.38	0.08	0.62
	Increase	**0.31**	**0.06**	**-0.25**	**0.10**	**0.09**	**0.38**	**0.08**	**0.39**
Europe (High income) Finland	2014	1.00	0.97	0.97	0.71	0.59	-	-	0.99
	2017	1.00	0.99	0.98	0.72	0.61	0.18	0.03	0.98
	2022	1.00	0.98	0.97	0.76	0.64	0.91	0.05	0.98
	Increase	**0.00**	**0.01**	**0.00**	**0.05**	**0.05**	**0.91**	**0.05**	**0.00**

Source: compiled by the author based on World Bank [16]

Table 1 shows the level of use of financial services in countries with different levels of economic development according to the UN classification, the main trends in the development of financial inclusion and the trends in the digitalisation of financial services in different parts of the world. In general, almost all the countries surveyed are experiencing the development of financial inclusion, as evidenced by the growth of financial inclusion and financial activity. There is also a strong correlation between per capita income and financial inclusion. This is confirmed by the example of Finland, as a representative of economically developed countries, where the formal banking system's development level has been high throughout the entire period under study.

There has also been a steady increase in the use of mobile and other digital banking products. Afghanistan has the lowest level of financial inclusion among the countries studied. As of 2022, only 10% of owned accounts in financial institutions, 3% used credit cards and other financial instruments, and 6% of citizens kept money in accounts for future planning. In addition, almost all financial inclusion indicators in Afghanistan in 2022 deteriorated compared to the previous period, confirming the political regime's influence on the development of financial systems. In other countries, there has been an increase in inclusion rates and significant penetration of digital financial instruments in economic life, especially in middle- and upper-middle-income countries.

The table also confirms a significant increase in the digital accessibility of financial services in low- and middle-income countries compared to middle- and high-income countries. For example, the last three indicators (f6, f7, f8) that characterise digital financial inclusion over the period 2014-2022 grew at the highest rates in Argentina, Congo, and Georgia. In Afghanistan, digital banking grew by 2% amid a decline in other accessibility indicators.

To assess the level of development of financial services in developing countries, the authors propose a financial inclusion index (I_{fi}), calculated using the formula:

$$I_{fi} = \frac{1}{n}\sum_{f=1}^{n} f^t \times \left(\frac{f^t}{f^b} + 1\right) \quad (1)$$

where f^t is a single indicator of financial inclusion as of the time of the study;

f^b – is a single indicator of financial inclusion as of the baseline period;

n – is several evaluation indicators.

The advantage of this formula is the possibility of using standardized indicators from the open database of the World Bank, taking into account the multifactorial nature of financial inclusion and the specific weight of each factor of influence. This index demonstrates the dynamics of changes in financial inclusion and allows for objective comparison of trends both within the country and with other countries, determining competitiveness.

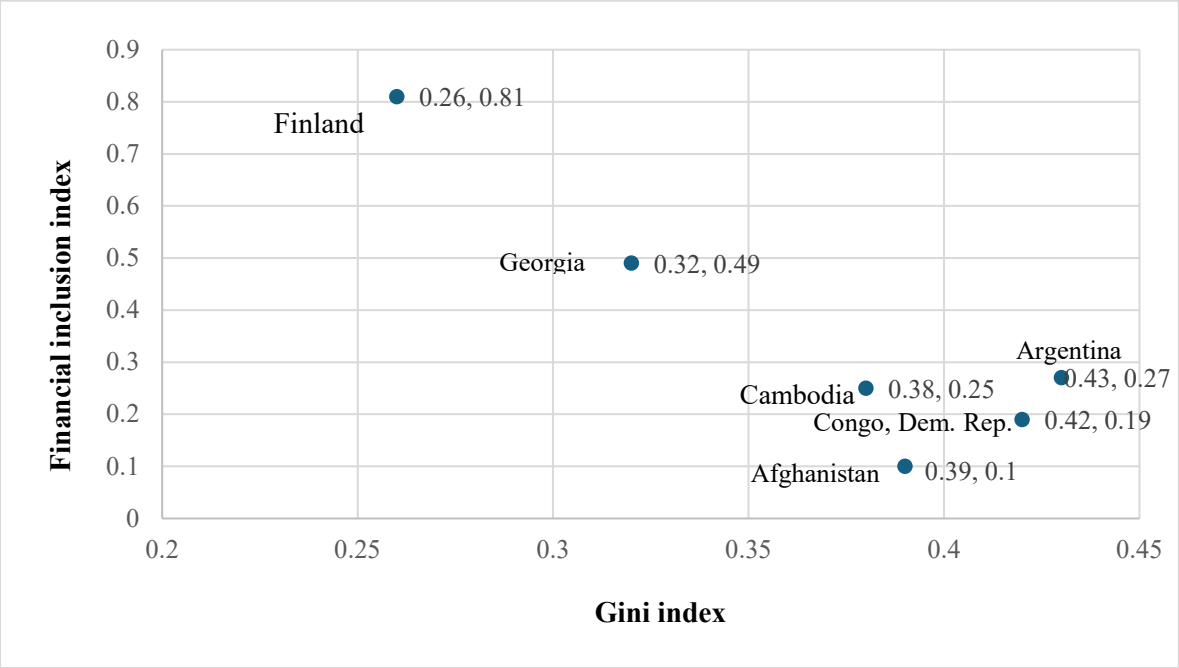
The proposed indicator allows for determining the level of financial inclusion using a wide range of assessment indicators, taking into account current data and the dynamics of growth in individual indicators. It can also be adapted to analyse financial inclusion by individual components that characterise the contribution of various financial market participants to its provision.

The previous analysis has shown a close relationship between a country's development level, GDP per capita, type of economy, development of democracy and the level of market penetration of banking services. At the same time, an important factor is the uniformity of distribution of national income among citizens, as expressed by the Gini index. This is also confirmed by research by scholars [9, 10].

To determine the mutual influence of economic inequality and financial inclusion, we compare the financial inclusion index calculated using formula (1) and the data in Table 1 for 2014–2022 and the Gini index calculated as the average value over the same period according to the World Bank. The results of the calculations are shown in Figure 3.

Next page

Figure 3: Correlation of the financial inclusion index and the Gini index



Source: Authors' calculations based on [16, 36]

Thus, reducing economic inequality is an important factor in the development and penetration of financial services in the country, the development of financial instruments and current trends in digitalisation. Studies have shown that the level of financial inclusion depends on many factors, including household incomes, the level of equality of national wealth distribution and the growth of the middle class, the political regime that affects financial market liberalisation, and the policy of the national bank. At the same time, expanding financial inclusion, especially in developing countries, is an important condition for their economic and social development and integration into global processes.

Transformation of financial services in the context of digitalisation: key trends and risks of digital

According to The Business Research Company, the financial services market has grown significantly. Its volume is expected to grow from $33,379.8 billion in 2024 to $35,857.46 billion in 2025, showing a compound annual growth rate (CAGR) of 7.4%. This growth in previous years has been driven by increased demand for fast and efficient money transfers, the active implementation of blockchain technologies in the banking sector, the growing use of digital banking services, government reforms in the insurance sector, robust economic development in emerging markets, and the growing popularity of cryptocurrencies [23].

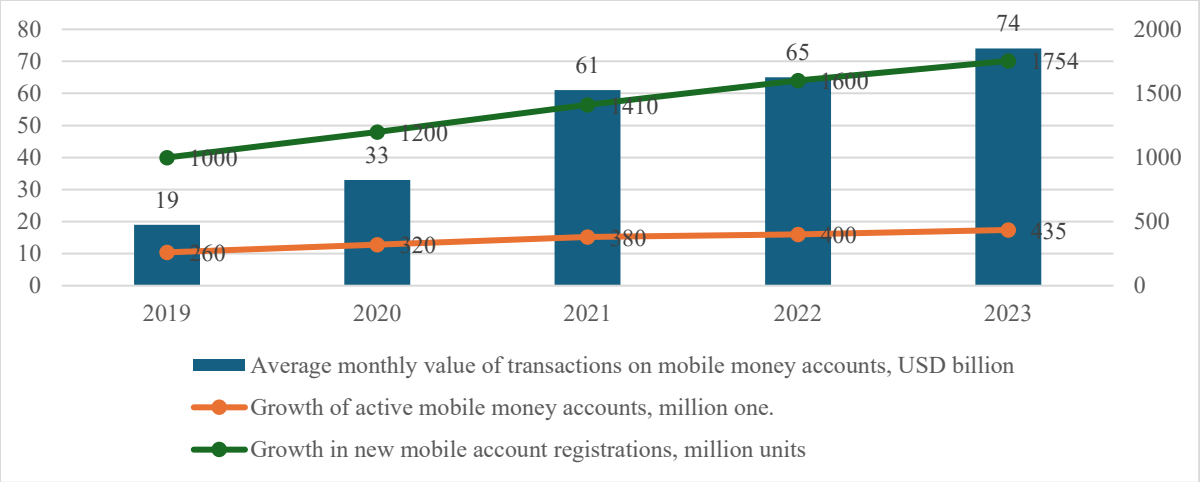
One of the key drivers of transformation in financial services and financial inclusion is the development of digital technologies. The main digitalisation trends rapidly spreading worldwide are the digitalisation of the banking sector and financial markets, the increase in productivity and popularisation of digitally active businesses, and the digitalisation of small businesses. Previously, starting a business required certain premises, equipment, or personnel, but now it is enough to have uninterrupted Internet access [37].

IBM experts [24] identify the main trends in financial market development in 2024 and 2025: generative artificial intelligence (AI), hybrid cloud technologies, investment in cybersecurity, sustainable development, the use of AI in personalising services for clients, the development of open banking, and the development of digital currencies. These trends need to be considered in the context of developing financial inclusion strategies for developing countries to integrate them more quickly into global financial flows.

Mobile banking is one of the digital technologies that has the most significant impact on financial inclusion and is growing rapidly in both developed and developing countries. Mobile wallets are a technologically advanced solution that increases security and convenience, meeting changing consumer expectations and industry requirements for health and hygiene [21]. According to the Global Mobile Money Dataset [17], the number of registered mobile money accounts globally increased 17.8 times between 2011 and 2021. Growth is also relatively high in developing countries.

For example, the number of mobile money account holders in sub-Saharan Africa (SSA) increased from 12% in 2011 to 33% in 2021. Figure 4 shows the dynamics of mobile payment growth in the world for the period 2019-2023.

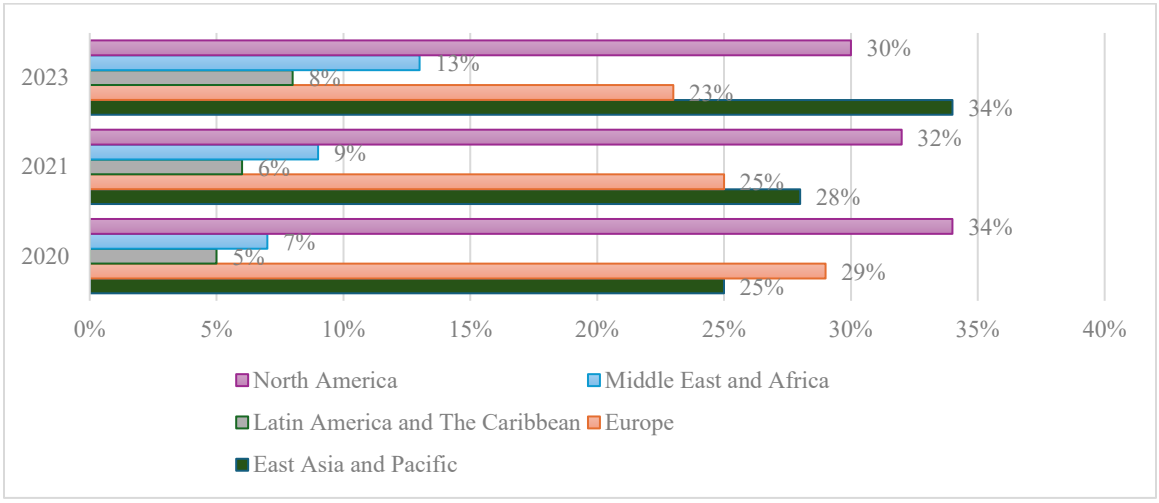
Figure 4: Dynamics of mobile banking development at the global level



Source: GSMA [17]

Digital banking is growing as payment systems, mobile applications, and digital currencies evolve and are becoming the most accessible and convenient alternative payment system in all countries, including emerging markets. According to Research and Markets [25], the global mobile banking market was estimated at USD 244.0 billion in 2023. By 2030, this figure is projected to grow to USD 668.1 billion, with a CAGR of 15.5% between 2023 and 2030. Figure 5 shows the regional distribution of the mobile banking market in 2023.

Figure 5: Dynamics of mobile banking market distribution



Source: Statista [22]

The share of developing countries in the mobile banking market is growing. The number of subscribers is growing fastest in the East Pacific region, driven by the active policies of the governments of India and China on digital transformation of financial services and rapid growth of e-commerce. The digital banking market in Latin America and Africa is also promising, where the number of mobile banking subscribers is growing by an average of 6–11% annually.

According to Polaris Market Research [21], the main drivers of digital banking development, especially in developing countries, include increased mobile technology penetration, development of digital payment infrastructure, support from governments and regulators, demand for financial inclusion, the COVID-19 pandemic, growth of the fintech

ecosystem, demographic changes (growth of the number of young people in the population of developing countries), reduction of service costs due to increased competition, improvement of financial literacy.

A new trend in the digitalisation of financial services is the rapid growth of FinTech companies, creating serious competition for traditional banks. FinTechs are replacing banks in many traditional markets, such as payment services, asset management, and financial advisory, and they offer customers convenient and affordable ways to interact. At the same time, fintechs pose new risks for consumers, as these non-banks are not subject to the strict regulation applied by central banks to ensure the banking system's stability [26, 38, 39]. This can threaten users and, consequently, create barriers to the spread of quality and safe financial inclusion.

Thus, even though digital technologies have made significant progress in the provision of financial services and contribute to the maintenance and development of financial inclusion, especially in developing countries, many scholars, including Budiyono and Sukamulja [27], believe that digital customer protection remains a serious problem today. Ahmed et al. [40] noted in their research that the lack of transparency and cases of fraud involving mobile money operators and telecommunications companies have deterred some people from participating in the mobile money sector and using digital financial services. In addition, the lack of interoperability between different digital payment platforms has raised concerns about the privacy and security of personal information transmitted through fragmented versions of such platforms. Priyadi [41] points out that the use of key technologies such as Short Message Service (SMS) and Unstructured Supplementary Service Data (USSD) on mobile phones also have security vulnerabilities that can be exploited to intercept digital banking transactions.

According to Kussainov et al. [42], anti-corruption governance mechanisms are key in ensuring stability and trust in the financial sector. In financial inclusion, these mechanisms create a transparent and accessible environment for various actors, including the poor and small businesses that traditionally have limited access to financial services. Potwora et al. [43] consider the formation and maintenance of the image of financial institutions and the use of marketing tools, including constant communication with customers, advice, and recommendations to be important factors in ensuring public trust in e-commerce banking services.

Based on the research conducted, it was found that the main threats and challenges to the development of digital banking in the context of their impact on financial inclusion are as follows: the growth of cybercrime and fraud, low levels of data protection, especially in the informal sector of digital services, vulnerabilities in mobile technologies to data interception or hacking, non-compliance with the principles of transparency and confidentiality by financial institutions, technical failures in systems and dependence on Internet access, low levels of financial and digital literacy.

These risks underscore the importance of ensuring strong security, using trusted platforms, and financial literacy among digital banking users. To ensure the success and security of digital financial services, promoters of such services and regulators must focus on strengthening existing customer protection laws relating to digital banking platforms. Mitigating the risks of modern digital finance requires joint efforts by the government and international financial organisations, fintech companies, financial institutions and regulators. In addition, it is important to develop an effective mechanism for recourse, compensation and legal protection for victims of fraud and cybercrime in digital banking, which will help improve financial inclusion and protect vulnerable groups.

Conclusion

Based on behavioural studies, it has been established that financial inclusion determines the level of access of the population of a country, region or a separate territory to traditional and digital financial services and products and the ability to use them safely and without interruption to meet their own life needs and develop their business. The level of financial inclusion depends on financial institutions' development, interaction, and government regulation's effectiveness.

The article assesses the development of financial inclusion for 2014–2022 in the context of six countries (Afghanistan, Argentina, Cambodia, Congo, Finland, Georgia and Georgia), which represent different parts of the world and belong to different groups in terms of per capita income. The results of the calculations confirmed the close relationship between the level of development of a country, GDP per capita, type of economy, development of democracy, level of market penetration of banking services and the level of equality of distribution of national wealth according to the Gini index.

The article shows that one of the main drivers of transformation in financial services and financial inclusion is the development of digital technologies, among which mobile banking is growing at the fastest pace in both developed and developing countries. Digital technologies significantly contribute to the development of financial services and

inclusion. However, their use is accompanied by risks: cybercrime, insufficient data protection, mobile technology vulnerabilities, privacy breaches, technical failures, internet dependence and low financial literacy of users. This underscores the importance of data protection, trusted platforms, and digital literacy.

References

1. Financial Inclusion. Lessons from World Bank Group Experience, Fiscal Years 2014–22. (2023). *World Bank Group.* https://documents1.worldbank.org/curated/en/099305408252329233/pdf/SEC-BOS1e6ff9a00041b4261bcdc9c154a7b.pdf
2. Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2020). The Global Findex Database 2017: Measuring financial inclusion and opportunities to expand access to and use of financial services. *The World Bank Economic Review*, *34*(Supplement_1), 2-8. https://doi.org/10.1093/wber/lhz013
3. Developing the Rural Economy through Financial Inclusion: The Role of Access to Finance (2024). *International Labour Organization*. https://www.ilo.org/publications/developing-rural-economy-through-financial-inclusion-role-access-finance
4. Nnaomah, U., Aderemi, S., Olutimehin, D., Orieno, O., & Ogundipe, D. (2024). Digital banking and financial inclusion: a review of practices in the usa and nigeria. *Finance & Accounting Research Journal, 6*, 463-490. http://doi.org/10.51594/farj.v6i3.971
5. Basel Committee on Banking Supervision Digitalisation of finance. (2024). *Bank for International Settlements*. https://www.bis.org/bcbs/publ/d575.pdf
6. Zabala Aguayo F., & Ślusarczyk, B. (2020). Risks of banking services' digitalisation: The practice of diversification and sustainable development goals. *Sustainability*, *12*(10), 4040. https://doi.org/10.3390/su12104040
7. Taghiyeva, A. (2023). Empowering women micro-entrepreneurs through mobile. *GSMA*. https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-for-development/wp-content/uploads/2023/02/Empowering-women-micro-entrepreneurs-through-mobile.pdf
8. Persaud, A., & Thaffe, W. (2023). The state of financial inclusion research on developing countries. *Transnational Corporations Review*, *15*(4), 22-3.
9. Xie, X. (2023). Analysing the Impact of Digital Inclusive Finance on Poverty Reduction: A Study Based on System GMM in China. *Sustainability*, *15*(18), 13331. https://doi.org/10.3390/su151813331
10. Wang, Z. (2025). Assessing the Impact of Financial Technology on Income Inequality: An Empirical Analysis Using Gini Coefficient and Theil Index. *Open Journal of Business and Management*, *13*, 111-128. https://doi.org/10.4236/ojbm.2025.131009
11. Klochan I., & Filipov D. (2023). Design of assessment and forecasting of the country's financial security in the conditions of change management. *Smart Economy, Entrepreneurship and Security, 1*(1), 31–42. https://doi.org/10.60022/sis.1.(01).3
12. Zolkover, A., Heidor, A., Hreshchuk, H., Verbytska, V., & Muraviov, K. (2023). Peculiarities of supporting enterprises with the help of financial instruments in the conditions of economic changes in Ukraine. *Economic Affairs (New Delhi), 68*(01s), 335-343. http://doi.org/10.46852/0424-2513.1s.2023.36
13. The Global Financial Inclusion Index 2022. (2022). *World Bank Group*. https://investchile.gob.cl/wp-content/uploads/2022/11/informe-de-inclusion-financiera-completo.pdf
14. Pesqué-Cela, V., Tian, L., Luo, D., Tobin, D., & Kling, G. (2021). Defining and measuring financial inclusion: A systematic review and confirmatory factor analysis. *Journal of International Development*, *33*(2), 316-341. https://doi.org/10.1002/jid.3524
15. Park, C. Y., & Mercado, R. (2018). Financial inclusion, poverty, and income inequality. *The Singapore Economic Review, 63*(1), 185-206. http://doi.org/10.1142/S0217590818410059
16. Global Financial Inclusion (Global Findex) Database 2021 (2022). *World Bank*. https://doi.org/10.48529/JQ97-AJ70
17. Global Mobile Money Dataset. (2024). *State of the Industry Report on Mobile Money*. London: GSMA.
18. Meshcheriakov, A., Bodenchuk, L., Liganenko, I., Rybak, O., & Lobunets, T. (2023). Trends in the Development of the Banking System of Ukraine under Conditions of Military Actions and Globalisation Influences. *Financial and Credit Activity: Problems of Theory and Practice, 3*(50), 8-22. https://doi.org/10.55643/fcaptp.3.50.2023.3993

19. Adegbite, O. O., & Machethe, C. L. (2020). Bridging the financial inclusion gender gap in smallholder agriculture in Nigeria: An untapped potential for sustainable development. *World Development*, *127*, 104755. https://doi.org/10.1016/j.worlddev.2019.104755
20. Ojo, T. A. (2022). Digital financial inclusion for women in the fourth industrial revolution: A key towards achieving sustainable development goal 5. *Africa Review*, *14*(1), 98-123. https://doi.org/10.1163/09744061-20220204
21. Mobile Wallet Market Share, Size, Trends, Industry Analysis Report, By Technology (Remote, Proximity), By Application (Retail & E-commerce, Vending Machine, Banking, Hospitality & Transportation, Others), By Region, And Segment Forecasts, 2024-2032. (2024). *Polaris Market Research*. https://www.polarismarketresearch.com/industry-analysis/mobile-wallet-market
22. Market share of digital/mobile wallets in total e-commerce and POS transaction value worldwide in 2023 with a forecast for 2027, by region. (2024). *Statista*. https://www.statista.com/statistics/1271701/share-of-digital-wallets-payments-in-e-commerce-by-region/
23. Financial Services Global Market Report 2025. (2024). *The Business Research Company.* https://www.thebusinessresearchcompany.com/report/financial-services-global-market-report
24. IBM (2024) Top financial services trends of 2024. https://www.ibm.com/think/insights/financial-services-trends.
25. Mobile Wallet and Payment Market Review and Forecast Through 2021-2031 with Global and Regional Data Shares. (2024). *Research and Markets*. https://www.globenewswire.com/news-release/2024/12/13/2996912/28124/en/Mobile-Wallet-and-Payment-Market-Review-and-Forecast-Through-2021-2031-with-Global-and-Regional-Shares-Data.html#:~:text= The%20global%20mobile%20wallet%20and,27.4%25%20from%202023%20to%202031
26. Murshudli, F. (2019). Digitalisation Challenges to Global Banking Industry (February 2019). In *Book of Proceedings. 37th International Scientific Conference on Economic and Social Development – "Socio Economic Problems of Sustainable Development"* (Baku, 14-15 February 2019). Baku: VDEA–UNEC, pp. 786-794. https://ssrn.com/abstract=4624253
27. Budiyono, E., & Sukamulja S. (2023). Digital Customer Protection: Mediator between Mobile Money Usage and Financial Inclusion. *Media Ekonomi dan Manajemen*, *38*(1), 205-233. https://jurnal.untagsmg.ac.id/index.php/fe/article/view/3374/1999
28. Levytska, S., Pershko, L., Akimova, L., Akimov, O., Havrilenko, K., & Kucherovskii, O. (2022). A risk-oriented approach in the system of internal audit of the subjects of financial monitoring. *International Journal of Applied Economics, Finance and Accounting, 14*(2), 194-206. https://doi.org/10.33094/ijaefa.v14i2.715
29. Sumets, A., Kniaz, S., Heorhiadi, N., Skrynkovskyy, R., & Matsuk, V.. (2022). Methodological toolkit for assessing the level of stability of agricultural enterprises. *Agric Resour Econ., 8*(1), 235-255. https://doi.org/10.51599/are.2022.08.01.12
30. Sumets, A., Tyrkalo, Y., Popovych, N., Poliakova, J., & Krupin, V. (2022). Modeling of the environmental risk management system of agroholdings considering the sustainable development values. *Agric Resour Econ Int Sci E J., 8*(4), 244-265.
31. Sustainable Development Goals: 17 Goals to Transform our World. (2015). *United Nations*. https://www.un.org/en/exhibits/page/sdgs-17-goals-transform-world
32. Shirono, S., Beyene, B., Fareed, F., Loots, C., Quevedo, A., & Naidoo, K. (2024). Understanding Barriers to Financial Access: Insights from Bank Pricing Data. *International Monetary Fund*, *2024*(150). https://doi.org/10.5089/9798400280627.001
33. Voronina, Y., Lopushynskyi, I., Grechanyk, B., Vahonova, O., Kondur, A., & Akimov, O. (2024). Economic and environmental component in the field of sustainable development management. *Calitatea, 25*(201), 7-14.
34. Lelyk, L., Olikhovskyi, V., Mahas, N., & Olikhovska, M. (2022). An integrated analysis of enterprise economy security. *Decis Sci Lett., 11*(3), 299-310. doi:10.5267/j.dsl.2022.2.003
35. Leveraging the Power and Resilience of Micro-, Small and Medium-sized Enterprises (MSMEs) to Accelerate Sustainable Development and Eradicate Poverty in Times of Multiple Crises. (2024). *United Nations*. https://www.un.org/en/observances/micro-small-medium-businesses-day

36. Gini index (World Bank estimate). (2024). *World Bank Group*. https://genderdata.worldbank.org/en/indicator/si-pov-gini?view=trend&geos=WLD_AFG_KHM
37. Bielialov, T., Kalina, I., Goi, V., et al (2023).Global experience of digitalisation of economic processes in the context of transformation. *Journal of Law and Sustainable Development, 11*(3). https://doi.org/10.55908/sdgs.v11i3.814
38. Kryshtanovych, M., Shulyar, R., Svitlyk, M., Zorya, O., & Fatiukha, N. (2023). Theoretical and methodological approaches to the formation of a model for increasing the efficiency of the system for ensuring the economic security of a banking institution. *Financial and Credit Activity: Problems of Theory and Practice, 2*(49), 56-64. https://doi.org/10.55643/fcaptp.2.49.2023.3994
39. Eka Pratiwi, L. R., & Krisnawati, A. (2021). The Role of Digital Consumer Protection in Mediating the Effect of Mobile Money usage towards Financial Inclusion: an Evidence from Buleleng, Indonesia, *International Journal of Science and Management Studies (IJSMS), 4*(5), 195-207. https://doi.org/10.51386/25815946/ijsms-v4i5p116
40. Ahmed, F., Hussain, A., Khan, S. N., Malik, A. H., Asim, M., Ahmad, S., & El-Affendi, M. (2024). Digital Risk and Financial Inclusion: Balance between Auxiliary Innovation and Protecting Digital Banking Customers. *Risks*, *12*(8), 133. https://doi.org/10.3390/risks12080133
41. Priyadi, D. A. (2020). The Impact Of Mobile Money On Financial Performance Of Msmes In Indonesia. In *Proceeding of International Conference Sustainable Competitive Advantage* (Vol. 1, No. 1, pp. 46-50). https://www.jp.feb.unsoed.ac.id/index.php/sca-1/article/view/1866
42. Kussainov, K., Goncharuk, N., Prokopenko, L., et al (2023). Anti-corruption Management Mechanisms and the Construction of a Security Landscape in the Financial Sector of the EU Economic System Against the Background of Challenges to European Integration: Implications for Artificial Intelligence Technologies. *Economic Affairs (New Delhi), 68*(1) 509-521. http://doi.org/10.46852/0424-2513.1.2023.20
43. Potwora, M., Zakryzhevska, I., Mostova, A., Kyrkovskyi, V., & Saienko, V. (2023). Marketing strategies in e-commerce: personalised content, recommendations, and increased customer trust. *Financial and Credit Activity: Problems of Theory and Practice, 5*(52), 562-573. https://doi.org/10.55643/fcaptp.5.52.2023.4190