Bank Digitalization, Financial Literacy, and Inclusion In Romania

~ *Ph.D. Student* **Isabelle-Margareta Oprea** *(Romanian Academy, School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, National Institute for Economic Research "Costin C. Kirițescu", Institute for Mondial Economy)* *ORCID: https://orcid.org/0009-0007-0647-8709*

E-mail: isabelle-margareta.oprea@ince.ro

~ *Ph.D. Student* **Liviu-Gelu Draghici** *(Romanian Academy, School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, National Institute for Economic Research "Costin C. Kirițescu", Institute of National Economy)* *ORCID:https://orcid.org/0009-0009-4389-4669*

E-mail: liviu-gelu.draghici@ince.ro

Abstract: *The study examines the challenges of promoting financial literacy and inclusion in Romania, a country characterized by significant reliance on cash transactions and a large digital divide. With financial services becoming increasingly digitalized, financial literacy is essential for inclusion in the banking system. Romania faces low bank account ownership and limited digital skills, despite having advanced internet accessibility. The purpose of this research is to analyse the connection between financial literacy, digitalization, and inclusion, and to propose strategies to improve these areas. The research is guided by two hypotheses: 1) Individuals with higher levels of financial literacy are more likely to adopt digital financial services, and 2) The digital divide, particularly in rural areas, is a significant barrier to financial inclusion. The methodology combines quantitative analysis of secondary data from sources such as the World Bank and European Commission's Digital Economy and Society Index, with a qualitative literature review of financial literacy and digitalization. The paper finds that Romania significantly lags behind EU averages in financial inclusion, driven by a preference for cash, distrust in financial institutions, and insufficient digital skills. Solutions such as blockchain, artificial intelligence, and open banking are proposed to enhance digital services and improve financial literacy. This research adds value by offering practical recommendations for policymakers and financial institutions to address the specific challenges in Romania's financial ecosystem, fostering inclusive economic growth through digital financial services. The study contributes* *to ongoing policy debates on financial inclusion and literacy, and highlights areas for future research, including the need for empirical data to assess the long-term effects of digital financial education programs.*

Keywords: bank digitalization, financial literacy, financial inclusion, Romania.
JEL Classification: G21, G53, I22

1. Introduction

Digitalization has gained significant momentum in recent years, particularly as a result of the COVID-19 pandemic. The financial sector has been no exception, with the concept of financial digitalization becoming part of everyday language. Financial digitalization can be measured through various indicators, such as online shopping, paying bills online, accessing bank accounts through the internet, using mobile phones for utility payments, engaging in digital transactions, and owning bank accounts and debit cards (Apostu et al., 2023).

Financial education and financial inclusion can no longer be discussed without considering digitalization, as it now encompasses far more than just economic knowledge. The rise of the internet, coupled with the widespread adoption of smartphones and mobile applications, has driven innovation across all sectors, and finance is no exception to this trend. Financial inclusion represents the access for individuals and businesses to financial products and services such as bank accounts, savings accounts, loans, insurance products, etc. that could enable them to save, receive and send money.

However, many people are unbanked due to a combination of factors leading to financial exclusion. The most important of these are: lack of resources and risk of poverty (Lopez Vilaplana, 2018), low financial literacy (Klapper et al., 2015), lack of trust in financial institutions (World Bank, 2023), low level of active population (Demirguc-Kunt et al., 2018), preference for cash payments (Wright, 2023) and the underground economy (Schneider, 2022).

To be able to use banking products and services, the population must first understand (at least at a minimal level) how they work and what they are. So, a minimum of financial education is needed to understand concepts such as bank accounts, credit, insurance products, etc. According to the literature, financial education is "The process by which financial consumers/investors improve their understanding of financial products and concepts and, through information, instruction and/or goals, advice, develop the skills and confidence to become more aware of financial risks and opportunities, make informed choices, know where to turn for help, and make effective decisions to improve their financial well-being." (OECD, 2005).

As society has developed, financial products and services have become more diverse and complex and, "the intensification of financial innovation is a challenge for people who have to cope with both the digital transition and the launch of new financial products and services that sometimes delight consumers with the promise of quick and consistent gains". (Vasile et al., 2021) Not everyone can keep up with these developments and "as more and more households are asked to make their own decisions on financial matters, financial illiteracy can become a serious threat to their lifelong well-being" (Batsaikhan & Demertzis, 2018).

1.1. Digitalization in the financial sector

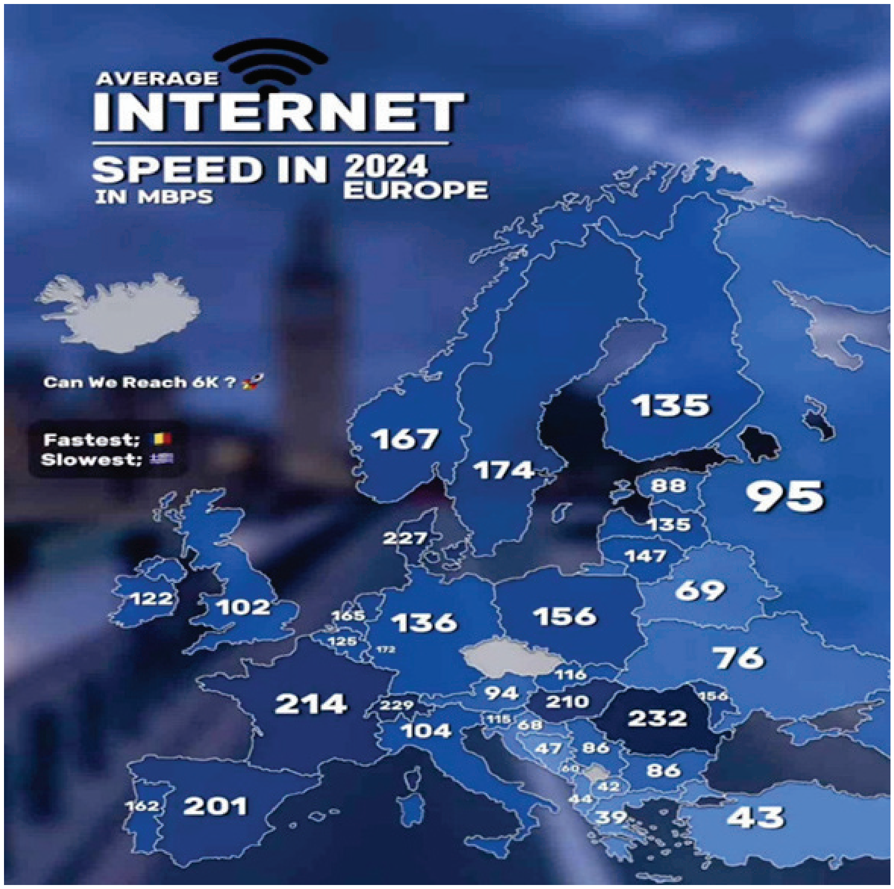
The advancement of digital banking services represents a major transformation in the financial industry, driven by the integration of technology to improve banking services and increase their accessibility (Oprea, I., & Duta, D. ,2024). When examining digitalization in the financial sector, it is important to highlight the relatively low number of bank account holders in Romania. Although the percentage of Romanians over 15 with bank accounts increased from 45% in 2011 to 69% in 2021, according to World Bank research (Demirguc-Kunt et al., 2018), many still remain unbanked. The same study revealed that 42% of those without accounts cited "insufficient funds" as the primary reason, 34% mentioned a lack of trust in banking institutions, 33% found having an account too expensive, 29% said a family member already had an account, 10% pointed to the distant location of banking institutions, and 6% lacked the necessary documentation (World Bank, 2023).

The low level of digitalization in Romania correlates with a strong preference for cash payments and a high percentage of unbanked individuals. Key indicators, such as online shopping, paying bills online, accessing online bank accounts, mobile payments, and ownership of bank accounts and debit cards, remain significantly below the EU average (Apostu et al., 2023).

According to the European Commission's Digital Economy and Society Index (DESI), Romania ranked last among 27 EU countries in 2022, with the gap between Romania and the rest of the EU widening. Alarmingly, only 9% of Romanians possess digital skills above the basic level (European Commission, 2022). Furthermore, with 92% of the Romanian population deemed financially illiterate (Nițoi et al., 2022), the connection between financial education and digitalization becomes even more apparent.

Interestingly, technical limitations are not a major factor contributing to the high usage of cash payments, as evidenced by the 21.31 million active mobile internet connections reported as of June 30, 2023 (ANCOM, 2023). Moreover, Romania boasts the fastest average internet speeds in the European Union in 2024, with an impressive 232 MBPS, while Greece has the slowest at just 39 MBPS.

Figure 1. Internet speed (download in Mbps) in EU in 2024.



Source: businessfibre.co.uk

A survey conducted with 400 participants identified several perceived risks that hinder the adoption of non-cash payments, thereby slowing the progress of digitalization in finance. These risks include "functional risk (e.g., perceived complexity, perceived incompatibility, and perceived cost), psychological risk (e.g., lack of trust, inertia, and technological anxiety), and other risks (e.g., privacy, security, financial, and operational risks)" (Cham et al., 2022). Romania's low level of digitalization cannot be attributed solely to individuals' reluctance to use electronic tools. The country significantly lags behind the EU average in terms of the availability of digital public services, scoring 44 points for general public services and 42 points for business services, compared to the EU averages of 75 and 82 points, respectively. Additionally, digital interaction between state institutions and citizens remains limited, with only 17% of internet users engaging with e-government services (European Commission, 2022).

Despite this, the push for digitalization was primarily motivated by the need to reduce operational costs through automation, increase the availability of banking services beyond traditional working hours, and eliminate repetitive, manual tasks from employees' workloads. Initially, the transition to digital banking was slow, as banks feared negatively impacting customer satisfaction.

However, driven by the 2008 financial crisis and further accelerated by the COVID-19 pandemic, some banks are now fully digitalized. Nonetheless, many individuals, particularly the elderly, still prefer human interaction for emotional and psychological reasons, as well as due to a lack of technological proficiency.

The limited digitalization of financial services and the continued reliance on cash payments in Romania were further highlighted by a study conducted by Wright (2023), which found that 78% of transactions in the country are made in cash. This places Romania at the top of the list of cash-dependent nations worldwide, well above the EU average of 99%.

Table 1. Top 10 countries dependent on cash.

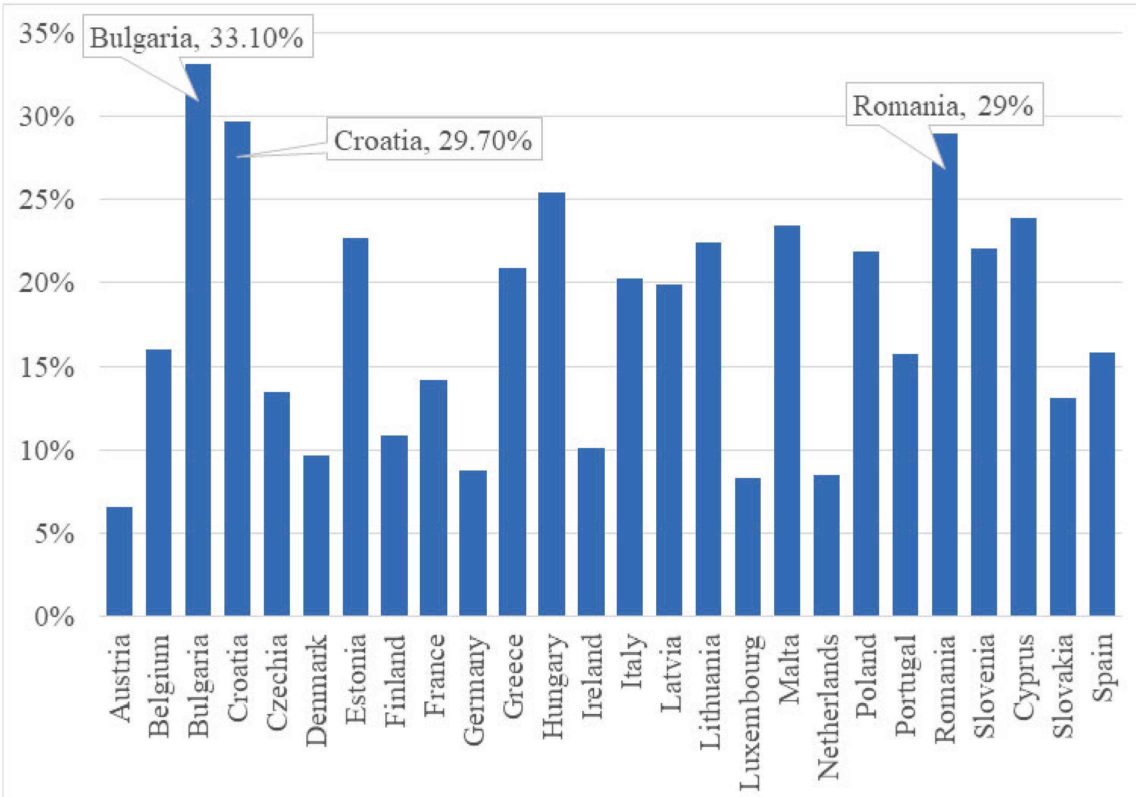
Rank	Country	Cash transactions (%)	Population unbanked (%)	Internet users (%)	No. of ATM per 100.000 adults
1	Romania	78%	42%	64%	64
2	Egypt	55%	67%	45%	20
3	Kazakhstan	60%	41%	76%	86
4	Bulgaria	63%	28%	63%	94
5	Ukraine	60%	37%	57%	96
6	Morocco	41%	71%	62%	29
7	Philippines	37%	66%	60%	29
8	Peru	22%	57%	49%	127
9	Hungary	45%	25%	77%	61
10	Vietnam	26%	69%	66%	26

Source: author using data from (Wright, 2023)

The preference for cash payments in Romania could be attributed to the scarcity of ATMs, particularly in rural areas. However, countries such as Morocco, Vietnam, and the Philippines, which have fewer ATMs per hundred thousand inhabitants and a higher percentage of unbanked populations, still exhibit a significantly lower percentage of cash transactions compared to Romania, despite having similar percentages of internet users. Research in this area has shown that "cashless payments stimulate economic growth, leading to increased private consumption and investment, which in turn contribute to GDP growth" (Wong et al., 2020). Therefore, greater digitalization in financial transactions could serve as a catalyst for economic development.

On the other hand, the prevalence of cash payments sustains the underground economy, placing Romania third in the European Union in this regard (Schneider, 2022), as illustrated in the accompanying figure (Figure 2).

Figure 2. Shadow economy in EU 2022.



Source: authors using data from (Schneider, 2022)

Approximately one-third of transactions remain untaxed, depriving the state budget of crucial resources that could be used for development. This is especially concerning given that studies, including those by Romanian researchers, have consistently demonstrated a "negative relationship between the underground economy and economic development" (Hoinaru et al., 2020).

1.2. Financial literacy and inclusion

Financial literacy is influenced by age, with various studies indicating that "younger individuals possess higher financial literacy compared to older generations" (Nițoi et al., 2022). This can be explained by the increasing complexity and variety of financial products and services, alongside a high degree of digitalization. Younger people, who are generally more tech-savvy, have access to the internet and own smartphones, making it easier for them to engage with financial products and services and access relevant information. In contrast, individuals over 60 often face both technical challenges and a lack of devices needed to access financial information. Geographical background also plays a role in financial literacy. People in urban areas benefit from greater access to educational resources and infrastructure, such as high schools, universities, libraries, and training programs, compared to those in rural areas. As noted by the same authors, "the relationship between financial literacy and financial inclusion is interdependent: financial literacy enhances access to financial services, and research shows that individuals with bank accounts are more likely to be financially informed and use related services" (Nițoi et al., 2022).

The Financial Education Strategy 2023-2030 emphasizes that "the aim of national financial education strategies is to enhance people's ability to better manage personal finances and reduce financial stress and the impact of financial crises on individuals and families" (Government of Romania, 2023). However, from interviews conducted by Nițoi et al. (2022) with 1,391 respondents, two noteworthy findings emerged. Firstly, "39% of respondents expressed no interest in receiving information about financial concepts." Secondly, for most participants, "personal experience and knowledge (41%) were the primary sources of information guiding financial decisions" (Nițoi et al., 2022). Moreover, other studies reveal that "48% of Romanians rely on family and friends for advice on savings and investments, while 19% turn to information from social media" (Erste Group, 2022). Additionally, "58% of respondents admitted to having neither access to financial information nor interest in improving their financial literacy" (Unlock Market Research, 2021).

Despite the varying percentages across these studies, several consistent patterns emerge: two in five individuals are not interested in receiving financial information, instead basing their decisions on personal experience or informal advice. This attitude presents a significant barrier to improving financial literacy. A potential solution would be to make financial information more accessible and easier to understand for the public. Regarding the responsibility for implementing financial education programs, respondents identified commercial banks, insurance companies, pension and investment funds, regulators, consumer protection authorities, and academic institutions as the most appropriate organizations to lead such initiatives (Nițoi et al., 2022). Another study found that "61% of respondents believe financial education should be the responsibility of schools and other educational institutions, 56% see it as the responsibility of parents and families, and 45% believe it should fall to banks and other financial institutions" (Erste Group, 2022).

2.Literature Review

The rapid digital transformation of the financial sector has fundamentally changed the way banking services are delivered and accessed. Bank digitalization has not only enhanced the efficiency and convenience of financial transactions but also holds significant implications for financial inclusion and literacy. Bank digitalization refers to the application of digital technologies in delivering banking services, from mobile banking and internet banking to the use of artificial intelligence (AI) and blockchain technologies. The transition from traditional banking models to digital platforms has enabled faster and more accessible banking services. According to Pînzaru et al. (2021), digital transformation in banking has fostered innovation in financial services, enhancing customer engagement and service delivery through digital channels. The authors argue that digital banking models are important for banks aiming to stay competitive in an era of increasing digital literacy among customers. The digitalization of banking also brings challenges, particularly for populations with limited access to digital infrastructure.

Bellofatto et al. (2018) point out that despite the growth of digital banking, there remains a digital divide that disproportionately affects rural and low-income communities. The authors state that digital banking services must be designed with inclusivity in mind to ensure that they do not exacerbate financial exclusion for vulnerable populations. Financial Inclusion through Digital Banking refers to the availability and equality of opportunities for individuals to access essential financial services, such as savings accounts, credit, and insurance. Digital banking has a significant role in improving financial inclusion, particularly in developing countries where access to traditional banking infrastructure is limited.

According to Kass-Hanna et al. (2022), digital banking services, including mobile money platforms, have become key drivers of financial inclusion in regions with limited banking infrastructure. Their study, using data from the Financial Inclusion Insights (FII) surveys, demonstrates that both digital and financial literacy significantly impact a household's ability to build financial resilience. In a similar way, Grohmann (2018) examines the impact of financial literacy on financial inclusion in emerging Asian economies. Her study, which focuses on the middle class in Bangkok, Thailand, finds that individuals with higher financial literacy are more likely to use a broader range of financial services, including fixed deposit accounts and insurance products. The study underscores the importance of financial literacy in ensuring that individuals can fully participate in the financial system, particularly in an increasingly digitalized economy. Digital platforms, such as mobile banking and Fintech solutions, have lowered the barriers to financial access, particularly in remote and underserved areas. The widespread use of mobile phones has facilitated the growth of mobile banking services, enabling people to perform financial transactions without the need for physical bank branches (Sendjaja et al., 2022).

However, as noted by Reiter and Beckmann (2020), financial inclusion is not solely about access to financial services but also about individuals' ability to use these services effectively. Their research across ten Central and South-eastern European countries found that financial literacy has a key role in financial inclusion, as individuals need to understand financial products to use them responsibly. The Role of Financial Literacy in Digital Banking Financial literacy is a critical enabler of financial inclusion, particularly in the context of digital banking. Lusardi and Mitchell (2017) define financial literacy as the ability to understand and apply various financial concepts, such as interest rates, inflation, and risk diversification. In their study on retirement planning, they find that individuals with higher financial literacy are better equipped to make informed financial decisions and are more likely to plan for long-term financial goals. This finding is particularly relevant in the digital age, where financial products are becoming more complex and diversified. Incorporating financial literacy into digital banking platforms can significantly enhance the effectiveness of digital financial services.

According to Fong et al. (2021), digital literacy is increasingly important as more financial services are offered online. The authors demonstrated that digital financial literacy – a combination of digital skills and financial knowledge – is essential for ensuring that individuals can safely and effectively use digital financial services. Their research on older adults in Singapore shows that those with higher levels of digital financial literacy are more likely to make timely credit card payments and participate in stock markets. Furthermore, Beckmann (2013) highlights the specific challenges of financial literacy in countries like Romania, where financial services for households are relatively new. Using data from the Euro Survey of the Austrian Central Bank, Beckmann found that financial literacy in Romania is among the lowest in Central and Eastern Europe. Her findings suggest that financial literacy initiatives are necessary to improve saving behaviour and participation in financial markets. In a similar context, Morgan and Long (2020) find that financial literacy has a positive impact on financial inclusion and savings behaviour in Laos. Their study emphasizes that financial education programs need to target rural populations and those with lower educational attainment to bridge the financial literacy gap. Challenges in Achieving Financial Literacy and Inclusion Despite the advancements in digital banking, there are significant challenges in achieving universal financial inclusion and literacy.

French and McKillop (2016) identify financial literacy as a key determinant of debt management and household net worth, particularly in disadvantaged communities. However, they also highlight the limitations of financial education programs, noting that knowledge alone is insufficient to improve financial behaviour. Behavioural biases, such as overconfidence and procrastination, often prevent individuals from applying their financial knowledge effectively. Moreover, the digital divide remains a persistent barrier to financial inclusion.

Chomczyk Penedo and Kramcsák (2023) argue that digital banking services are not evenly distributed, with rural populations and older individuals often excluded from the benefits of digitalization. The authors suggest that policymakers must address infrastructure gaps and invest in digital literacy programs to ensure that all segments of the population can access and use digital financial services. In summary, while bank digitalization offers significant opportunities for enhancing financial inclusion and literacy, it also presents challenges that need to be addressed. The existing literature highlights the importance of integrating financial literacy into digital banking services to ensure that individuals can make informed financial decisions. However, achieving universal financial inclusion requires a multi-faceted approach that addresses both the digital divide and the behavioural barriers to effective financial management.

3. Data and methods

The research utilizes a mixed-method approach, incorporating both qualitative and quantitative methods to thoroughly examine financial inclusion and digitalization in Romania. This combination allows for a nuanced understanding of the factors that influence financial literacy and inclusion in the digital era, with a focus on testing the following research hypotheses: 1. Individuals with higher levels of financial literacy are more likely to adopt digital financial services. 2. The digital divide, particularly in rural areas, is a significant barrier to financial inclusion.

The quantitative method relies on secondary data from established sources, such as the World Bank, the European Commission's Digital Economy and Society Index (DESI), and national surveys on financial literacy. These data sources provide statistical insights into key areas such as the percentage of the population with access to banking services, internet usage, and the adoption of digital financial products. The collected data were manually analyzed, with descriptive statistics used to highlight patterns, trends, and relationships between digital literacy and financial inclusion. The qualitative aspect of the study involves a review of relevant literature and reports, examining the challenges faced in promoting financial literacy in a digital context. Themes such as the digital divide, technological anxiety, and the role of financial institutions in promoting education were explored through this literature review. By synthesizing findings from various sources, the study provides insights into the barriers to financial inclusion and the potential strategies for overcoming them.

Research Hypotheses: 1. Individuals with higher levels of financial literacy are more likely to adopt digital financial services 2. The digital divide, particularly in rural areas, is a significant barrier to financial inclusion.

4. Results and discussion

4.1. Proposals for increasing digitalization in the financial sector

The advantages of digitalization in the financial sector have been discussed earlier in this paper; however, in Romania, where 4 out of 5 payments are still made in cash, several measures are necessary to reduce cash transactions and encourage electronic payments. Nonetheless, these measures are likely to face resistance from certain segments of the population, particularly those over the age of 60. A survey of 400 respondents revealed several perceived risks associated with non-cash payment adoption, including "functional risks (e.g., perceived complexity, incompatibility, and cost), psychological risks (e.g., lack of trust, inertia, and technological anxiety), and other risks (e.g., privacy, security, financial, and operational risks)" (Cham et al., 2022). Beyond psychological barriers, accessibility remains the primary factor that can drive the increase of cashless payments. Financial institutions must expand the number of ATMs, especially in rural areas, with the support of local authorities or private operators who can provide the space for ATM installation. Banks could collaborate to allow customers free access to existing infrastructure. Additionally, streamlining the account-opening process by offering online options and reducing bureaucracy would make banking services more accessible.

Furthermore, banks need to actively combat fraud and financial crimes, innovate in products and services, adapt to customer needs, and maintain consistent, clear communication with clients. To accelerate the digitalization of the banking system, attention must be given to innovative technologies, regulatory frameworks, customer engagement strategies, and enhanced security measures. Key areas include:

a) Implementing Blockchain Technology for Enhanced Security and Efficiency: Blockchain can greatly improve the security, transparency, and efficiency of banking transactions. By utilizing a decentralized ledger system, it reduces fraud risks and simplifies operational processes (Nakamoto, 2008).

b) Leveraging Artificial Intelligence for Customer Service and Risk Management: AI has the potential to transform customer service using chatbots and virtual assistants, providing personalized banking support around the clock. Additionally, AI can strengthen risk management by predicting and addressing financial threats through advanced analytics (Huang & Rust, 2018).

c) Utilizing Big Data Analytics for Personalized Banking Services: Big Data allows banks to process large amounts of customer information, enabling them to offer personalized products and services, enhance customer experiences, and make more informed business decisions (George, Haas, & Pentland, 2014).

d) Adopting Open Banking to Foster Innovation and Collaboration: Open Banking, which involves sharing banking data through APIs with third-party developers, promotes innovation, improves customer services, and facilitates the development of new financial applications and services (Gomber, Kauffman, Parker, & Weber, 2018).

e) Enhancing Cybersecurity Measures to Protect Against Digital Threats: As digital banking expands, so do the risks of cyberattacks. Implementing advanced cybersecurity solutions, such as multi-factor authentication and end-to-end encryption, is essential to protect customer data and maintain trust (Romanosky, 2016).

f) Promoting Digital Financial Literacy Among Customers: Educating consumers on how to use digital banking tools and the importance of cybersecurity can boost digital adoption, while also making the digital banking experience safer and more beneficial for users (Lusardi & Mitchell, 2014).

By incorporating these innovative approaches into their operations, banks can significantly enhance their digitalization efforts, providing safer, more efficient, and personalized services to customers. The success of these initiatives depends not only on technological advancements but also on regulatory support, customer acceptance, and ongoing innovation.

4.2. Proposals for increasing financial inclusion

A study that surveyed 168 papers presenting the results of 201 previous studies caught our attention. According to (Fernandes et al., 2014) "interventions to improve financial literacy explain only 0.1% of the variance in financial behaviours studied, with weaker effects in low-income samples". So, it is not enough just to carry out these one-off initiatives, we need more. The aforementioned authors draw an even more ominous conclusion: "like other education, financial education deteriorates over time; even large interventions with many hours of training have negligible effects on behaviour 20 months or more after the intervention." (Fernandes et al., 2014) Unfortunately, this view is not unique, with other researchers reaching a similar conclusion: "Tracking students who have taken such a course for a period of 5 years shows no positive impact on financial literacy, attitudes toward saving, or any favourable behavioural change" (Mandell, 2011). That the results of mass financial education are not as expected, Björklund and Sandahl also note in a recent article (Björklund & Sandahl, 2023).

Increasing financial literacy requires a shift from an information-centred approach to one that is goal-oriented, action-oriented and behaviour change-oriented (Jula & Jula, 2023). If we refer to pupils and students, specific financial education concepts could be included in the curriculum of other subjects (e.g. calculating interest and taxes in mathematics) and, depending on the specific age of the learners, various stories or games could be used (Drăghici, 2024). For high school students simulating scholarship activity through play "consistently increases literacy scores, indicating that teaching should be interactive, contemporary, and fun" (Mandell, 2011). Rather than financial information delivery, the focus should be on using information aggregators, credit comparators and how information can be selected and used because "52% of consumers tend to opt for the first product they see when they get a checking account or credit card"(Jana, 2015). The solution is to "design training approaches that more effectively lead young people to put relevant financial knowledge into practice and do so correctly when making financial decisions" (Salas-Velasco et al., 2021).

There is also a need to measure the effectiveness of these initiatives both in the short term (after completion of the process) and in the medium term (six months and one year, respectively) after completion of the initiative. However, the over-55 population, especially in rural areas, will be quite difficult to reach and educating this part of the population may present challenges due to several factors. First, resistance to change is quite strong among older people because of habits and habits formed and a preference for familiar routines. These people have experienced over time several events with financial impact (extreme poverty and deprivation during the communist period, post-revolutionary predatory schemes and bank failures, inflation from 1991-1994, the 2008 financial crisis, the COVID-19 pandemic, etc.). Secondly, the fixed perception of education that many older people believe is appropriate for young people, fuelled on the one hand by cultural norms and on the other by previous educational experiences. Physical and cognitive limitations such as impaired hearing or visual acuity, concentration difficulties or possible mobility problems can affect the readiness to learn and the ability to learn.

Limited access to physical or online educational resources and technological limitations make education difficult for people over 55. Social isolation can also be a barrier to education for this segment of the population. The solution to combat these shortcomings may be the implementation of educational projects by private entities (such as banks) or non-profit associations, with the support of local authorities and community influencers (such as priests, postmen, etc.). Information campaigns via radio, television and the Internet and the design of public service announcements that run regularly on these channels may be ways of reducing resistance to change. Another aspect to consider when talking about financial education concerns the training of teachers who will teach financial education concepts. Many of the teachers who now teach financial education in grade 8 do not have a specialist background but have taken the qualification exam in the subject 'social education'. Most of them have erroneous (limiting) beliefs about money and financial education and either do not understand or misunderstand certain concepts in the financial field.

Some researchers have realised that it is important to educate teachers first "about their own personal finances to better prepare them to teach financial education" (Hensley et al., 2017), with an accredited "Economic and Financial Education for Teachers" course already available in Romania since 2021. "The target group of this course is secondary school teaching staff who teach the subject "Social Education" to 8th grade students" (M.E.C, 2021). As other researchers note, "the current institutional context is favourable to the development of financial education projects, given the increase in initiatives to strengthen the education sector, but also the existence of an initiative to develop a national financial education strategy" (Nițoi et al., 2022). It only remains that, under the coordination of the authorities (whether we are talking about the Ministry of Education, the NBR, the ASF or any other institution), these projects should pursue a common goal and quantifiable objectives. Soon, in terms of financial education, the focus should shift from "what and how much is done" to "how" and especially "why" it is done. There is no doubt that the responsibility for financial education (as in any field) lies primarily with the individual. But if they are unwilling, unable, or unable to educate themselves financially, the state and public or private financial institutions should take responsibility for this.

5. Conclusions, limitations, and future research directions

Financially educated individuals tend to experience a higher level of economic well-being due to their ability to make more informed decisions. Financial literacy and financial inclusion are intrinsically linked to digitalization, primarily due to the rise of the internet and widespread access to smartphones. An analysis of financial digitalization should begin with examining the number of bank cards in circulation and the proportion of the population that holds a bank account. Romania ranks first globally in the use of cash payments, with 78% of transactions conducted in cash. Additionally, only 69% of its citizens have a bank account, placing Romania last among European Union countries, where the average percentage of banked individuals is 99%. Furthermore, Romania ranks last in the Digital Economy and Society Index (DESI), despite having 21.31 million internet connections—more than its population—and being among the top three EU countries in terms of download speed. However, the low level of digitalization cannot be solely attributed to the population. It is also due to the limited availability of digital public services for the general public (44 points compared to the EU average of 75 points) and the low percentage of SMEs with at least a basic level of digital intensity (22% compared to the EU average of 55%).

In this context, Romania's shadow economy accounts for 29% of GDP, with only Croatia and Bulgaria reporting higher figures. The COVID-19 pandemic accelerated the adoption of digitalization in education, and the European framework prompted the development of a financial education strategy along with various initiatives and projects in this area. Nevertheless, 92% of Romanians remain financially illiterate, a problem stemming from the population's reluctance to engage in such initiatives, the limited effectiveness of financial education programs, and the older population's lack of technical skills. To enhance financial literacy, there needs to be a shift from an information-based approach to one that focuses on setting goals, acting, and fostering behavioral changes. Rather than simply providing financial information, emphasis should be placed on the use of information aggregators, credit comparison tools, and strategies for selecting and utilizing relevant information. Additionally, teachers responsible for financial education must receive proper training, as many are currently social science graduates without specialized financial expertise.

To boost digitalization, financial institutions must invest in the necessary infrastructure, streamline online processes by reducing bureaucratic hurdles, and embrace innovations such as blockchain technology, artificial intelligence, big data analytics, cybersecurity, and open banking. While Romania's low ranking in financial literacy and digitalization within the European Union highlights significant challenges, it also presents substantial opportunities for growth. There is vast potential for improvement, and professionals in the economic sector—whether in education or research—have considerable work ahead to drive meaningful change and transformation in this area.

The paper contributes to academic literature by linking financial literacy and digitalization, focusing on Romania's challenges with low financial inclusion. It offers insights into the digital divide, critiques current financial education programs, and provides practical solutions for policymakers to enhance digital financial literacy and foster inclusive economic growth.

The research is limited by its reliance on secondary data and literature reviews, lacking primary data or empirical studies that could provide more nuanced insights. It also focuses mainly on Romania, limiting broader generalizability to other contexts. Additionally, the absence of longitudinal data restricts analysis of long-term effects of digital financial literacy initiatives.

Future research should focus on gathering primary, empirical data to better understand the impact of digital financial literacy programs, particularly through longitudinal studies that track behavioural changes over time. Studies could also expand beyond Romania to examine the broader applicability of findings in different socio-economic and cultural contexts. Additionally, exploring the role of emerging technologies like blockchain and AI in fostering financial inclusion could provide valuable insights. Investigating the specific challenges faced by vulnerable populations, such as the elderly, should also be prioritized.

REFERENCES:

1. ANCOM. (2023). Piața serviciilor de comunicații electronice din România. Raport de date statistice -semestrul I 2023.
2. Apostu, S. A., Panait, M., Vasile, V., Sharma, G. D., & Vasile, R. (2023). FinTechs and financial inclusion—Balkan experience: Digital perspectives on financial markets. Electronic Journal of Information Systems in Developing Countries, 89(2). https://doi.org/10.1002/isd2.12257
3. Average European Internet Speed By Country In 2024, https://businessfibre.co.uk/europe-internet-speed-2024/, accessed on 8th osf October 2024
4. Batsaikhan, U., & Demertzis, M. (2018). Financial literacy and inclusive growth in the European Union. Bruegel Policy Contribution, 8.
5. Bellofatto, A., D'Hondt, C., & De Winne, R. (2018). Subjective financial literacy and retail investors' behavior. Journal of Banking & Finance, 96, 295-308.
6. Beckmann, E. (2013). Financial literacy and household savings in Romania. Financial Literacy and Financial Inclusion, 37-52.
7. Björklund, M., & Sandahl, J. (2023). Teaching and learning financial literacy within social studies–a case study on how to realise curricular aims and ambitions. Journal of Curriculum Studies, 55(3). https://doi.org/10.1080/00220272.2023.2203771
8. Cham, T. H., Cheah, J. H., Cheng, B. L., & Lim, X. J. (2022). I Am too old for this! Barriers contributing to the non-adoption of mobile payment. International Journal of Bank Marketing, 40(5). https://doi.org/10.1108/IJBM-06-2021-0283

9. Chomczyk Penedo, A., & Kramcsák, P. T. (2023). Financial inclusion in digital banking. Journal of Financial Innovation, 7(3), 125-137.
10. Demirguc-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution. In The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution. https://doi.org/10.1596/978-1-4648-1259-0
11. Drăghici, L. (2024). Bune practici în educația financiară -povești și jocuri pe care le putem folosi la orele de educație financiară. http://edutime.ro/revista-edutime-nr-7/#flipbook-df_9173/3/
12. Erste Group. (2022). Schimbări de comportament financiar. 47% dintre români și-au restrâns cheltuielile în ultimul an din cauza creșterii prețurilor. https://www.bcr.ro/ro/presa/informatii-de-presa/2022/09/19/schimbari-de-comportament-financiar-47-la-suta-dintre-romani-si-au-restrans-cheltuielile-in-ultimul-an-din-cauza-cresterii-preturilor
13. European Comission. (2022). Indicele economiei și societății digitale (DESI) 2022 România.
14. Fernandes, D., Lynch, J. G., & Netemeyer, R. G. (2014). Financial literacy, financial education, and downstream financial behaviors. Management Science, 60(8). https://doi.org/10.1287/mnsc.2013.1849
15. Fong, J. H., Koh, B. S. K., Mitchell, O. S., & Rohwedder, S. (2021). Financial literacy and digital inclusion among older adults in Singapore. Journal of Financial Planning, 34(1), 45-63.
16. French, D., & McKillop, D. (2016). Financial literacy and household debt: Evidence from credit unions in Northern Ireland. Journal of Financial Services Research, 50(1), 79-99.
17. George, G., Haas, M. R., & Pentland, A. (2014). Big data and management. Academy of Management Journal, 57(2), 321-326.
18. Gjergji, O. (2022). Average internet speed across Europe. https://datavis.europeandatajournalism.eu/obct/connectivity/
19. Gomber, P., Kauffman, R. J., Parker, C., & Weber, B. W. (2018). On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services. Journal of Management Information Systems, 35(1), 220-265.
20. Grohmann, A. (2018). Financial literacy and financial behavior in Asia. Asian Development Review, 35(2), 52-70.
21. Guvernul României. (2023). Strategia națională de educație financiară.
22. He, Z., Huang, J., & Zhou, J. (2023). Open banking and fintech competition: Policy implications. Journal of Banking Regulation, 24(2), 139-162.
23. Hensley, B. J., Jurgenson, J. B., & Ferris, L. A. (2017). Combining Adult Education and Professional Development Best Practice to Improve Financial Education Teacher Training. Journal of Financial Counseling and Planning, 28(1). https://doi.org/10.1891/1052-3073.28.1.33
24. Hoinaru, R., Buda, D., Borlea, S. N., Văidean, V. L., & Achim, M. V. (2020). The impact of corruption and shadow economy on the economic and sustainable development. Do they "sand the wheels" or "grease the wheels"? Sustainability (Switzerland), 12(2). https://doi.org/10.3390/su12020481
25. Huang, M. H., & Rust, R. T. (2018). Artificial intelligence in service. Journal of Service Research, 21(2), 155-172.
26. Jana, V. (2015). Improving the financial literacy of European consumers. Members' Research Service, May.
27. Jula, N.-M. & Jula, D. (2023). "Impact of Main Skills Targeted by CVT Courses on Economic Activities of Enterprises". Romanian Statistical Review, no. 1, pp. 49-69. https://www.revistadestatistica.ro/wp-content/uploads/2023/03/4_RRS-1_2023.pdf.

28. Kass-Hanna, J., Lyons, A. C., & Liu, F. (2022). Financial literacy and resilience-building behaviors: Evidence from developing countries. Journal of Financial Inclusion, 18(4), 233-248.

29. Kaiser, T., Lusardi, A., Menkhoff, L., & Urban, C. (2022). Financial education affects financial knowledge and downstream behaviors. Journal of Financial Economics, 145(2), 255–272. https://doi.org/10.1016/j.jfineco.2021.09.022

30. Klapper, L., Lusardi, A., & van Oudheusden, P. (2015). Insights from the Standar[redacted]S Ratings Services Global Financial Literacy Survey. In Financial literacy around the world.

31. Lopez Vilaplana, C. (2018). People at risk of poverty or social exclusion. EUROSTAT Statistics in Focus, 4.

32. Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. Journal of Economic Literature, 52(1), 5-44.

33. Lusardi, A., & Mitchell, O. S. (2017). Financial literacy and retirement preparedness: Evidence and implications for financial education. Business Economics, 42(1), 35-44.

34. Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. Retrieved from http://bitcoin.org/bitcoin.pdf

35. Mandell, L. (2011). Financial Literacy: If It's so Important, why isn't It Improving? SSRN Electronic Journal. https://doi.org/10.2139/ssrn.923557

36. M.E.C. (2021). Comunicat-comun-acreditare-curs-pentru-formatori.

37. Morgan, P. J., & Long, T. Q. (2020) Financial literacy and financial inclusion in developing countries: Evidence from Laos. Asian Economic Journal, 34(3), 67-85.

38. Nițoi, M., Clichici, D., Zeldea, C., Pochea, M., & Ciocîrlan, C. (2022). Financial well-being and financial literacy in Romania: A survey dataset. Data in Brief, 43. https://doi.org/10.1016/j.dib.2022.108413

39. OECD. (2005). Improving financial literacy: Analysis of issues and policies. In Improving Financial Literacy: Analysis of Issues and Policies (Vol. 9789264012578). https://doi.org/10.1787/9789264012578-en

40. Omarini, A. E. (2018). Fintech and the future of banking: Banking-as-a-platform. Journal of Financial Perspectives, 5(2), 117-137.

41. Oprea, I., & Duta, D. (2024). Banking Digitalization: The Foundation for Financial Inclusion and Sustainable Growth. Revista de Drept Bancar si Financiar, 18.

42. Pînzaru, F., Dima, A. M., Zbuchea, A., & Vereș, Z. (2021). Sustainability and digital transformation in banking. Sustainability, 13(6), 1425-1440.

43. Reiter, S., & Beckmann, E. (2020). Financial literacy in Central and Southeastern Europe: New insights from the OeNB Euro Survey. Journal of Financial Literacy Research, 9(1), 88-102.

44. Romanosky, S. (2016). Examining the costs and causes of cyber incidents. Journal of Cybersecurity, 2(2), 121-135.

45. Salas-Velasco, M., Moreno-Herrero, D., & Sánchez-Campillo, J. (2021). Teaching financial education in schools and students' financial literacy: A cross-country analysis with PISA data. International Journal of Finance and Economics, 26(3). https://doi.org/10.1002/ijfe.2005

46. Sendjaja, T., Rivai, V., Sofriana, Z., & Lo, S. (2022). Mobile banking and financial inclusion: Lessons from emerging markets

47. Schneider, F. (2022). New COVID-related results for estimating the shadow economy in the global economy in 2021 and 2022. International Economics and Economic Policy, 19(2). https://doi.org/10.1007/s10368-022-00537-6

48. Unlock Market Research. (2021). Studiu BCR: Doar 38% dintre români își urmăresc cheltuielile. https://www.bcr.ro/ro/presa/informatii-de-presa/2021/09/21/Studiu-BCR-Doar-38-procente-dintre-romani-isi-urmaresc-cheltuielile-si-le-prioritizeaza-corect

49. Vasile, V., Panait, M., & Apostu, S. A. (2021). Financial inclusion paradigm shift in the postpandemic period. Digital-divide and gender gap. International Journal of Environmental Research and Public Health, 18(20). https://doi.org/10.3390/ijerph182010938

50. Wong, T. L., Lau, W. Y., & Yip, T. M. (2020). Cashless Payments and Economic Growth: Evidence from Selected OECD Countries. Journal of Central Banking Theory and Practice, 9. https://doi.org/10.2478/jcbtp-2020-0028

51. World Bank. (2023). Data - Indicators. The World Bank Group.

52. Wright, I. (2023). The countries most reliant on cash. [Brochure]. https://merchantmachine.co.uk/most-reliant-on-cash/

Acknowledgement

The first version of the paper was presented in an early form (as a power point presentation) at the International Conference EUB-2024 Ecology of XXI Century (Ecological University of Bucharest, Faculty of Financial Management, April 4, 2024). We thank the participants in the section "Economics of sustainable development. Economic Resilience to the Global Climate Challenge" for their attention to our paper and their valuable comments.