



Development of Bank Payment Systems in the Digital Economy of the Republic of Moldova

Stela CIOBU¹, Domnica TCACI²

ARTICLE INFO

Article history:

Received 16 September 2024

Revised 10 October 2024

Accepted 30 October 2024

Published 29 November 2024

JEL classification:

G21; O31; O33; K42

Keywords:

Bank payment system

Central Bank

Cyber security

Digital economy

Card payments

Cashless transactions

Fast payments

Digital innovations

Clearing and settlement

ABSTRACT

Payment systems represent an integral part of the banking industry. In the modern world, convenience is essential and because of the increasing requirements of people towards reduced costs, faster processing period, increased security, and effortless operation process, digital banking is becoming more and more popular among population, constituting already a significant component of their lives, what can be explained with 65.3% of customers using online platforms for financial management and transactions. Credit cards, e-cash, internet, mobile, QR code, and e-check payments are few examples of payment methods that a closely associated with people's daily lives nowadays. The efficient and secure operation of payment systems is essential not only for each individual separately, but also for the economy's financial system overall performance. Thus, using robust payment systems is essential to maintain and enhance financial stability. In recent years, there has also been a significant breakthrough in the design of payment systems, especially with regard to the development and widespread adoption of systems that use real-time gross settlement. The object of the study is the development of bank payment systems in the context of digital economy in the Republic of Moldova. The purpose of the research is the analysis of digital payment systems in the banks of the RM, pursuing the activities taken for the sustainable implementation of innovations in the field at national level, assuming the international practice.

¹ Corresponding author; Associate Professor, Academy of Economic Studies of Moldova, Kishinev, Republic of Moldova, stela.ciobu@gmail.com, ciobu.stela@ase.md; ORCID: [0000-0002-2542-0955](https://orcid.org/0000-0002-2542-0955)

² Master's graduate, Academy of Economic Studies of Moldova, Kishinev, Republic of Moldova, domnita_tcaci@mail.ru

1. Introduction

Payment systems represent an integral part of the banking industry. To this extent, is considered “if money is the lifeblood of modern monetary economies, payment systems are the circulation system”, making it easier for funds to circulate across accounts, allowing both buyers and sellers to perform financial transactions without difficulty.

The need for research was influenced by the changing modern world, where convenience is essential and because of the increasing requirements of people towards reduced costs, faster processing period, increased security, and effortless operation process, digital banking is becoming more and more popular among population, constituting already a significant component of their lives, what can be explained with 65.3% of customers using online platforms for financial management and transactions. Credit cards, e-cash, internet, mobile, QR code, and e-check payments are few examples of payment methods that a closely associated with people's daily lives nowadays.

To this point, digital payment technology has expanded swiftly on a global scale, and its huge power and influence are becoming considerably widespread; 3.6 billion individuals used digital banking globally in 2023 as a consequence. Additionally due to mobile phone increasing usage, the faster global growth of digital banking payment systems is fuelled.

The efficient and secure operation of payment systems is essential not only for each individual separately, but also for the economy's financial system overall performance. Thus, using robust payment systems is essential to maintain and enhance financial stability. In recent years, there has also been a significant breakthrough in the design of payment systems, especially with regard to the development and widespread adoption of systems that use real-time gross settlement.

2. Methodology

The emphasis is placed on modern literature, reflecting the field's growing boundaries, relying on national legislation and procedures, as well as specialized literature, publications, books, and articles. Consequently, the most recent data and discoveries in the field were gathered in order to prioritize current research.

The *purpose* of the paper is to determine and analyse the evolution and premises for innovation of the digital payments in the Republic of Moldova under the tough competition and fast changing world.

In order to achieve the set goal, the following *objectives* were proposed:

- to understand the importance of the digital payment systems for the economy;

- to emphasize the risks and drawbacks in the development of digital payments in the RM;
- to analyse the bank payment systems dynamics and risks in the RM;
- to explore the international practices and trends regarding the payment systems.

3. Importance of Digital Payment Systems for the Economy

Bank payment systems are mechanisms established by banks to facilitate clearing and settlement of financial transactions, involved in comprehensive markets with several kinds of participants: *banks; central banks; money market*.

However, innovation in the payments industry has always been driven by the need for security and cost-effectiveness conducting to the expansion of different types of payment methods, ranging from traditional cash transactions to the latest digital developments. Experts generalize and classify them into two major categories: *large value payment systems*, to handle high-value, critical payments, because the efficient functioning of the financial system and the economy depends on this vital payment system, and *retail payment systems*, handling low-value but frequent high-volume transactions involving individuals, businesses and corporations.

In other words, the importance of digital payment systems for the economy is significant, because they are affecting it in all its aspects, as: *boost the economic growth* - economic activity is stimulated by higher consumer spending and investment; *provide enhanced transparency and accountability* - digital transactions create a digital trail, which facilitates revenue tracking and compliance enforcement by tax authorities; *efficiency and cost reduction* - cutting down on paper work and quicker payment processing; *financial stability* - its capacity to operate securely and effectively even in the event of an economic shock; *financial inclusion* - underprivileged groups now have access to financial services thanks to digital payment methods.

Undoubtedly payment systems have a positive effect, but at the same time they generate certain risks, like: *systemic risk, fraud activity; counterfeiting; cybersecurity*, and here the central bank is taking over the stage, insuring the safety and integrity of payment systems by mitigating the threats.

It is known that customers' wants and needs represent the primary driving force for developing society. Hence, consumers' expectations of quick and simple access to products and services have prompted significant modifications to the payments infrastructure. With a steady growing tendency of the market size of mobile wallet transactions Far East and China lead the world with an increase of 30.36% from 2020 to 2023 followed by North America (59.51%), Europe (136.34%) and Latin America (152.14%) (Statista, 2024a).

Currently, eWallet mobile apps are the most widely used type of fintech service, with billions of consumers worldwide using them and making them a household word (Fig. 1).

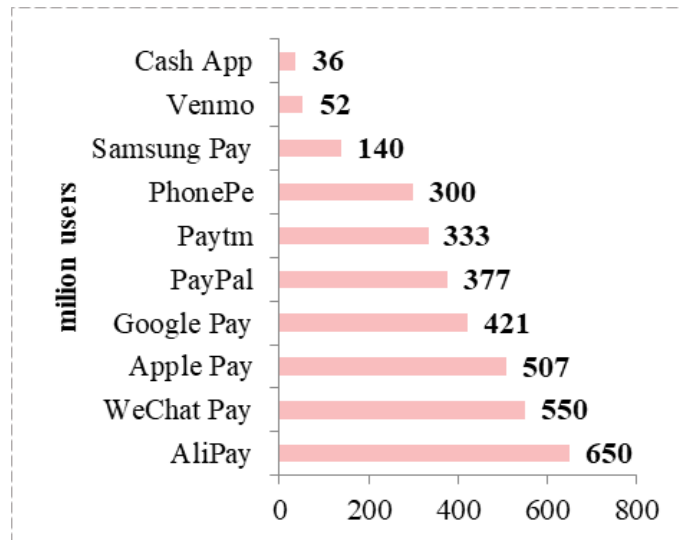


Fig. 1. Mobile payments users by app in 2023, million users
Source: Adapted from Curry (2024)

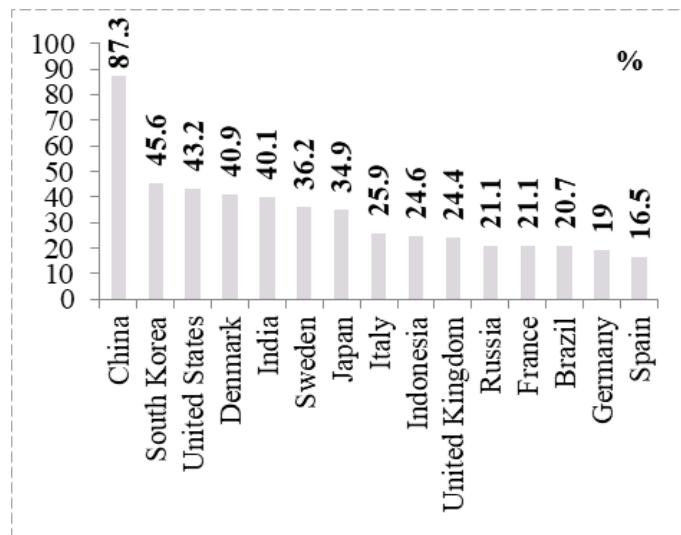


Fig. 2. Mobile payments app adoption by country in 2023, %
Source: Adapted from Curry (2024)

China leads the world in the uptake of mobile payments, with street food vendors, taxis, and buskers all accepting QR codes for payment, with 87.3 % of population using the payment apps for their daily needs, followed by South Korea with 45.6% and United States with 43.2%, respectively. Similar QR code usage is experiencing a spike in adoption in India. Germany and France have much lower adoption rates, in part because banks and mobile payment users are hesitant (Fig. 2).

Due to the increased number of users using the apps for their daily operations, the digital world is changing in order to meet the customers' expectations and provide them with better financial solutions.

4. Structure and Legal Framework of Bank Payment Systems in the Republic of Moldova

Payment systems in the Republic of Moldova represent all the systems, mechanisms, institutions which, on the basis of rules, procedures and arrangements, ensure the initiation, processing, clearing and/or settlement of money transfer operations between participants.

The National Bank of Moldova (NBM) is mandated by Law No. 548/1995 to carry out the following basic tasks: licensing, operating, regulating, monitoring, and supervising the financial market infrastructures in the Republic of Moldova; payment instruments and other payment system components; and the issuance of electronic money (National Bank of Moldova, 1995).

It is required to determine the main components of the payment system to understand how the RM is adjusting to the increasing world trends, accordingly: the Automated Interbank Payment System (AIPS) is the system through which interbank payments in Moldovan lei are made within the Republic of Moldova and is composed of the net settlement system (DNS), real-time gross settlement system (RTGS) and the instant payment system (MIA instant payments); a securities settlement system; payment instruments and Automated Remote Servicing Systems (ARSS) that are an electronic way of remote use of the before-mentioned payment instruments (Fig. 3).

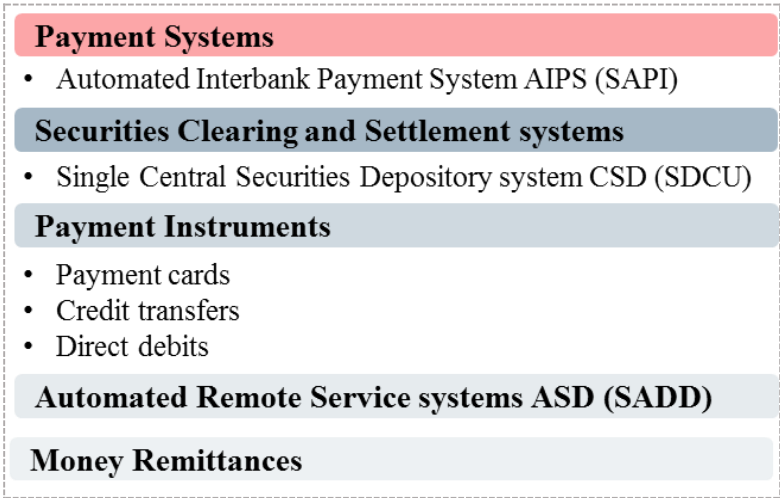


Fig. 3. List of payment and settlement systems and components in the Republic of Moldova subject to oversight by the NBM

Source: Adapted from National Bank of Moldova (2023b)

An important step toward bringing the regulatory framework for payment services even closer to the new EU regulations in this area is the transposition of the European Directive (PSD2) into national legislation, which focuses on open banking, instant payments and adoption of advanced payment message format ISO 20022; and the project Twinning, which helped RM to meet the requirements in order to join the Single Euro Payments Area (SEPA). The accession file was submitted for assessment to the European Payments Committee on 30 January 2024.

5. Bank Payment Systems Dynamics in the Republic of Moldova

In the following is proposed to delve into the analysis of the volume and number of transactions performed within the bank payment systems starting with AIPS.

For analysis one of the systemically important system is proposed, the AIPS, that for the period 2018-2023, registered an increase of 42.85 p.p. in volume of payments performed up to 1.71 billion MDL and of 14.28 p.p. in number of payments up to 14.84 million MDL (Fig. 4).

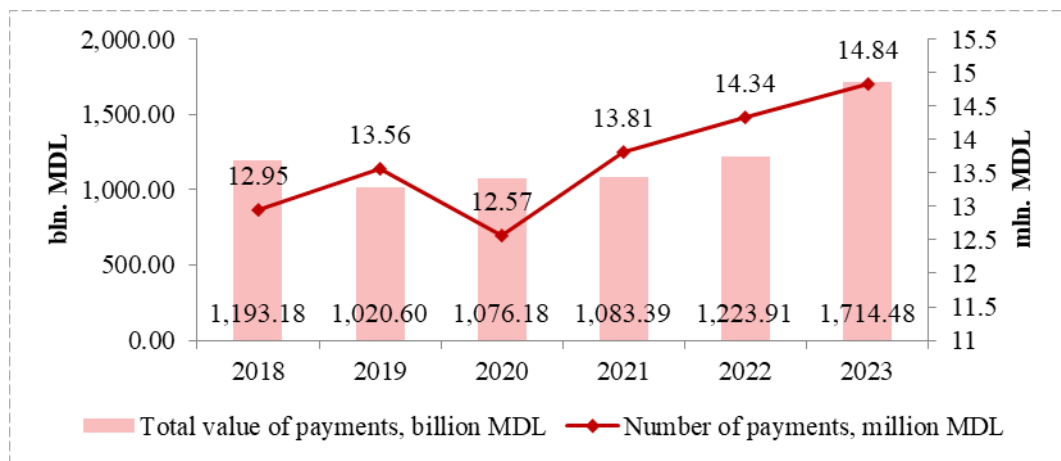


Fig. 4. Total number and value of payments processed via AIPS for 2018-2023

Source: Authors' elaboration based on data presented by NBM in the Reports on the evolution of financial market infrastructures in the Republic of Moldova

In terms of structure, payments made through RTGS component hold almost 85% of the total share of payments performed, but has registered an increase to a less extent, of 29%, than DNS system that represents about 15%, but increased three times from 2018 to 2023, due to highly encouraged online transaction by more and more individuals (Fig. 5).

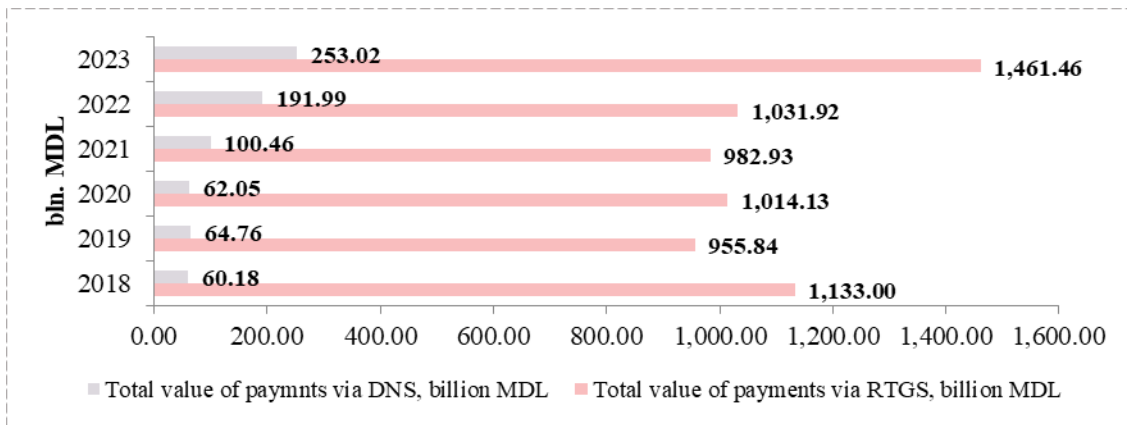


Fig. 5. Types of transactions processed through AIPS for 2018-2023, billion MDL

Source: Authors' elaboration based on data presented in the Reports on the evolution of financial market infrastructures in the Republic of Moldova

The Instant system was launched on March 12, 2024, so for the year 2023 it did not process transactions.

As regards the share of participants in AIPS according to documents initiated on behalf of clients by number of payments for the period 2018-2023 emphasize the CB Moldova Agroindbank (MAIB) on the top with 23.6%, followed by CB Moldindconbank with 21% and BC Victoriabank with almost 13%. Jointly, these three commercial banks constitute almost 58% of total participants in AIPS. Meanwhile, from the point of view of the structure of payments performed by AIPS participants, the following representation can be noted: ordinary transfers of clients - 60.3% of the total number of payments; transfers related to budget payments - 36.6%; other types of payments - 3.1%³ (National bank of Moldova, 2024).

In the Republic of Moldova, cashless payment methods are crucial to the operation of payment systems, especially throughout the stages of payment formation, validation, and transmission. In this context, payment cards, credit transfers and direct debit are accepted as forms of payment.

At the end of 2023, the total number of cards in circulation issued by payment service providers in the country amounted to 3.29 mln., increasing by 70.05 p.p. from 2018.

³ Active card is a payment card used for at least one financial operation during a quarter.

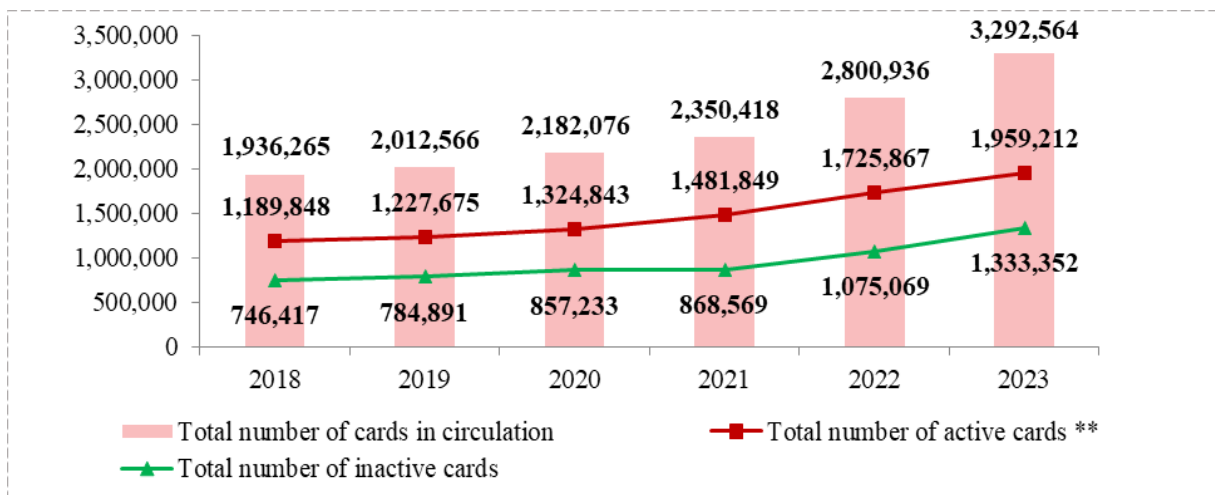


Fig. 6. Total number of cards in circulation by degree of use, 2018-2023

Source: Authors' elaboration based on National Bank of Moldova (n.d.a)

There is also reflected the classification of cards by degree of use. So, during the analysed period an increasing trend is perceived of active cards of 64.67 p.p. in 2023 compared to 2018 and 78.63 p.p. for inactive cards, which is not so good because a lower credit score, account closure, and security problems can result from inactive cards (Fig. 6).

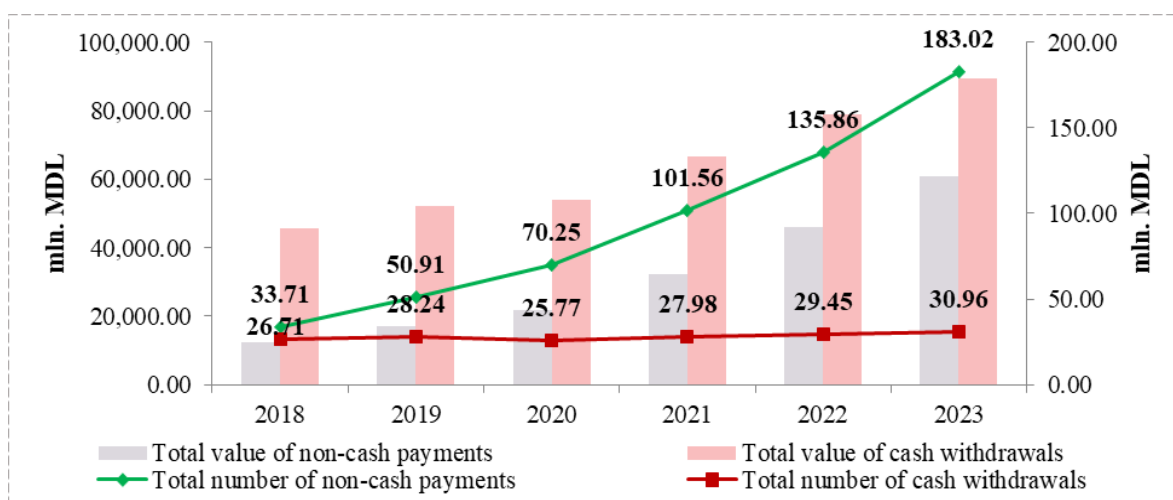


Fig. 7. Number and value of payment card transactions in the Republic of Moldova with cards issued in RM for 2018-2023, million MDL

Source: Authors' elaboration based on National Bank of Moldova (n.d.b)

Regarding the non-cash payments, there is a huge increase in the number and volume of transactions performed, by almost 4 times compared to 2018 up to 60 709.95 mln. MDL in volume of payments, while the volume of cash withdrawals doubled during the analysed period, increasing with 96%, up to 89 456.66 (Fig. 7). Even if the volume of cash withdrawals exceed the volume of non-cash payments

with almost 30 mln. MDL, the fact that people are oriented more towards digital payments is justified by the increasing number of cards under general conditions with almost 14% in 2023 compared to 2018, constituting a share of 41% of the market of payment cards (Fig. 8).

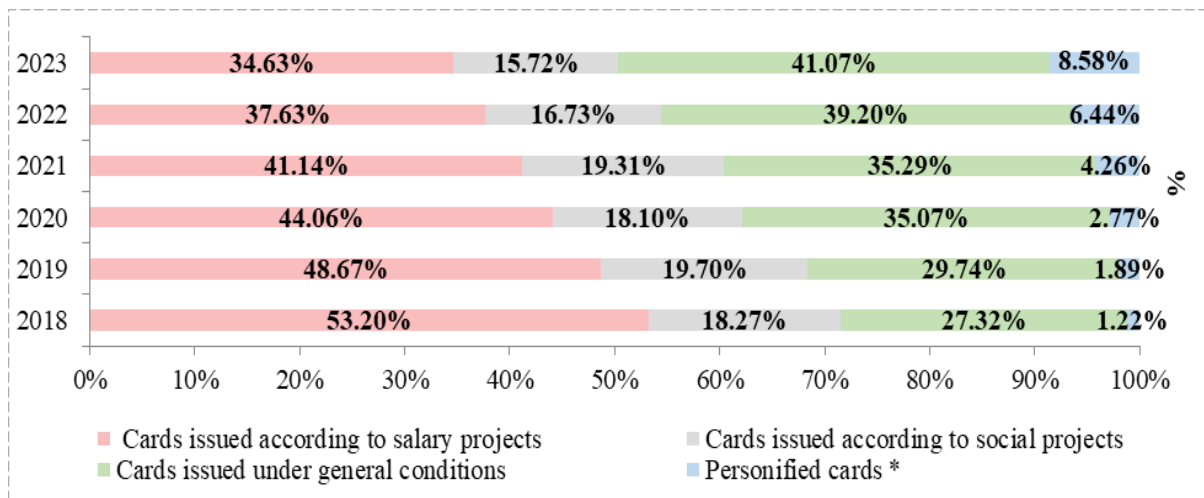


Fig. 8. Share of payment cards by conditions for issue for 2018-2023, %

Source: Authors' elaboration based on National Bank of Moldova (n.d.a)

Meanwhile, the era of hybrid and magnetic stripe cards is passing away, and we observe this from the decreasing trend which brings their share in the total number of issued cards, close to zero at the end of 2023. However, the market get occupied by contactless cards with an increase by almost 50% up to 98% of the market share, and the other 1.18% get occupied by virtual cards, whose position is strengthening (Table 1).

Table 1. Share of cards by type of technical solution, 2018-2023

	2018	2019	2020	2021	2022	2023
Proximity cards (contactless)	49,91%	69,18%	80,15%	92,68%	97,60%	98,33%
Hybrid cards	47,17%	30,35%	19,64%	7,21%	2,19%	0,48%
Magnetic stripe cards	2,75%	0,35%	0,12%	0,02%	0,00%	0,00%
Virtual cards	0,17%	0,12%	0,10%	0,09%	0,21%	1,18%

Source: Authors' elaboration based on National Bank of Moldova (n.d.a)

Customers' preference for speed and technology is a driving force in the banks' rivalry, as well, and the rank of bank providers gives us clarity on the issue.

Regarding the number of cards in 2023, 93% of the market is hold by 4 systemic banks, with CB Moldindconbank on the first place with 39%, followed by CB MAIB with 36%, CB Victoriabank and OTP Bank (Fig. 9).

Almost the same situation is maintained with the number of special devices like ATMs and POS terminals, but at this point CB MAIB is leading the market with 42%, followed by CB Moldindconbank with 27% and CB Victoriabank with 22% (Fig. 10).

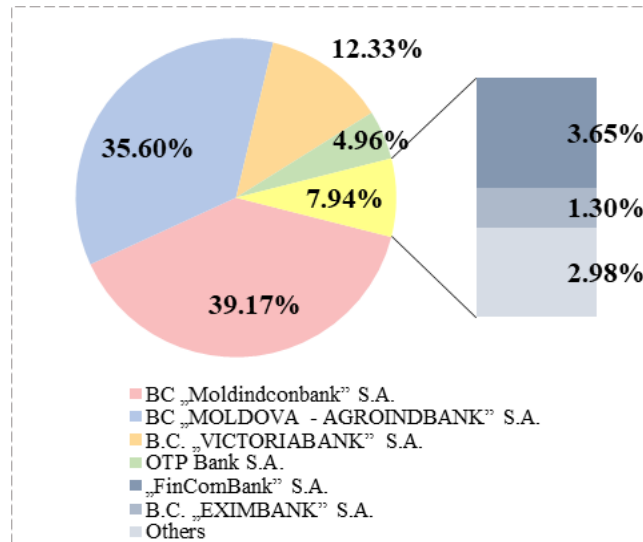


Fig. 9. Number of payment cards in circulation in Republic of Moldova per provider in 2023, %

Source: Authors' elaboration based on National Bank of Moldova (n.d.c)

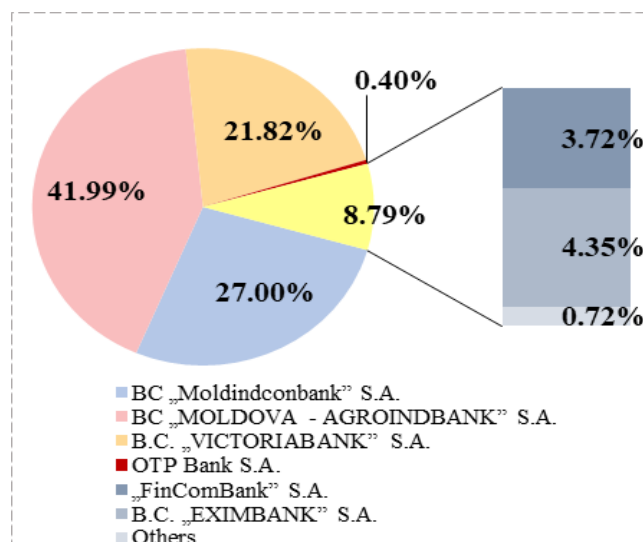


Fig. 10. Number of special devices (ATMs and POS terminals) by provider in 2023, %

Source: Authors' elaboration based on National Bank of Moldova (n.d.c)

Automated Remote Servicing Systems (ARSS) are IT solutions and/or equipment, made available to holders by payment service providers, which allow them, by means of an IT application, an authentication method and a means of communication, to have remote access to the means on the payment account in order to obtain information on the status of the payment account and the transactions carried out, as well as to carry out transactions on behalf of and on the order of the holder on the account of the means on the payment account (National Bank of Moldova, 2024).⁴

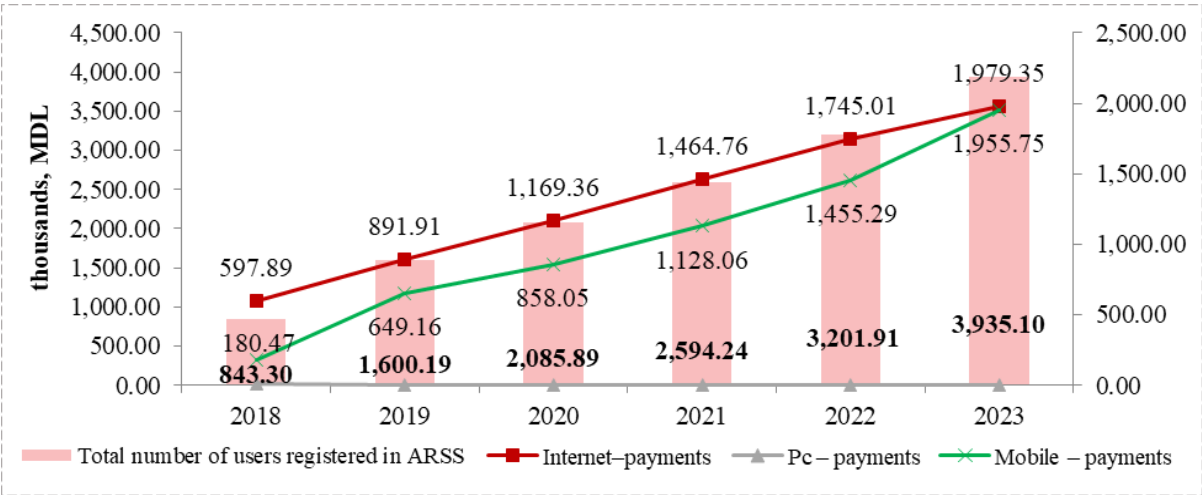


Fig. 11. Total number of users registered in ARSS by type of application/remote access channel used for 2018-2023, thousands MDL

Source: Authors' elaboration based on National Bank of Moldova (n.d.d)

The total number of ARSS holders amounted to 3.935 million users at the end of the 2023, an increase of 366.63 percent compared to 2018 (Fig. 11). The increase in the number of active users was generated by their impressive increase of almost 7 times in number of users of mobile applications, which illustrates that this type of applications is gaining popularity in the Republic of Moldova due to the convenience and flexibility of managing money remotely. Bearing in mind that often one holder uses more than one ARSS, the number of unique holders is substantially lower, but even taking this into account, the figure is quite impressive.

In 2023, 57.1 million transactions were carried out through ARSS, 20.6 percent more than in 2022.

At the same time, during 2023 it was found that payment service providers stopped offering PC-payments systems (holders of PC-payments were only legal

⁴ Personified card is a payment card attached to a payment account, without the information about the client embossed on it.

entities), and during 2021-2023 they also stopped offering telephone-payments systems (National Bank of Moldova, 2024).

6. Evaluation of Risks and Drawbacks in the Development of Bank Payment Systems in the Republic of Moldova

Over the past few years, there has been a significant global shift in the payment systems landscape. The simplicity and flexibility of making retail payments has improved because of technological advancements such as online banking and mobile payments, ascertained by the increasing number of e-commerce platforms by 56.9 percent to 1 199 platforms by the end of 2023, that are accompanied by some risks categories such as: operational, legal, credit, and data integrity risk.

A relevant indicator reflecting the extent of fraud and used in international practice is the ratio of the amount of fraud to the value of payment card transactions, which in comparison to 2018 has decreased by 19.8 p.p. meaning that the bank became more involved in improving the measures for customer protection, but also the population improved the level of literacy in using digital payments (Fig. 12). In this regard, the respective indicator for 2023 amounted to 0.019 percent of the total value of transactions carried out with cards issued in the Republic of Moldova, which is still significantly lower than the European level of 0.028 (National Bank of Moldova. (2023b).

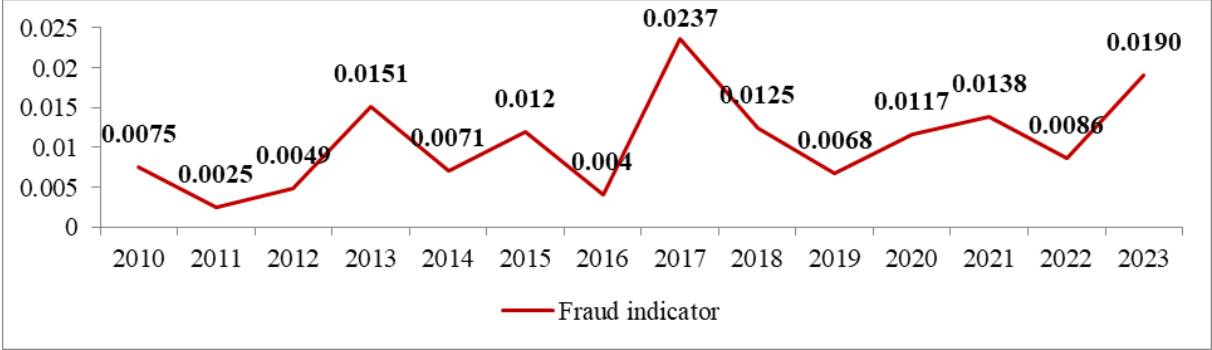


Fig. 12. Payment card fraud indicator in the Republic of Moldova, 2010-2023

Source: Authors' elaboration based on data presented by NBM in the Reports on the evolution of financial market infrastructures in the Republic of Moldova

7. Bank Payment Systems Innovations at International and National Level

With significant changes in recent years that have huge effects on competitiveness and financial regulation, payments are likely the financial activity most impacted by innovations. The adoption of new technology and business

strategies, the rise new competitors, and modifications to the market's structure have all contributed to the payments industry's swift evolution.

In order to make financial and monetary transactions easier, payment and settlement systems are essential. Nowadays, payment systems tend to be more safe, inexpensive, and easily available, and also support growth, financial stability, and financial inclusion.

Secure, dependable, and effective domestic and international payment systems are strongly promoted by the World Bank Group (Bech & Hancock, 2020). Their main efforts are on following:

- development of strong legal and regulatory foundations for payment systems;
- supporting ACH and RTGS systems;
- improvement of retail payment systems for routine transactions as a priority;
- enabling smooth and easy transactions across borders;
- following advancements in cryptocurrency, central bank digital currency, and open banking.

Customers have always been drawn to self-service innovation throughout its history: this trend began with ATMs and is currently being seen in the emergence of chat-bots and mobile banking, and is represented the trend of evolution of cashless payments around the world for 2023, which registers an increase with 56.6 p.p. compared to 2022 (Fig. 13). Also, there is presented the forecast for 2027 which is going almost to double the current figures by that period.

Talking about innovations in payment systems, is to be mentioned first about ISO 20022 messaging standard, meant to be “a common language for financial services industry launched by Geneva-based International Organization for Standardization in 2004.” (Federal Reserve Bank, 2024)

Both instant payments and the general upgrading of payment procedures depend on ISO 20022 messages. They specifically offer corporates and banking systems an easily interchangeable, organized, and data-rich common language. Real-time payment processing and the transition from batch file processing at the end of the day to this capacity are essential developments. Moreover, ISO 20022 communications offer improved analytics potential that may result in the provision of innovative payment services to customers of financial institutions at significant new price points.

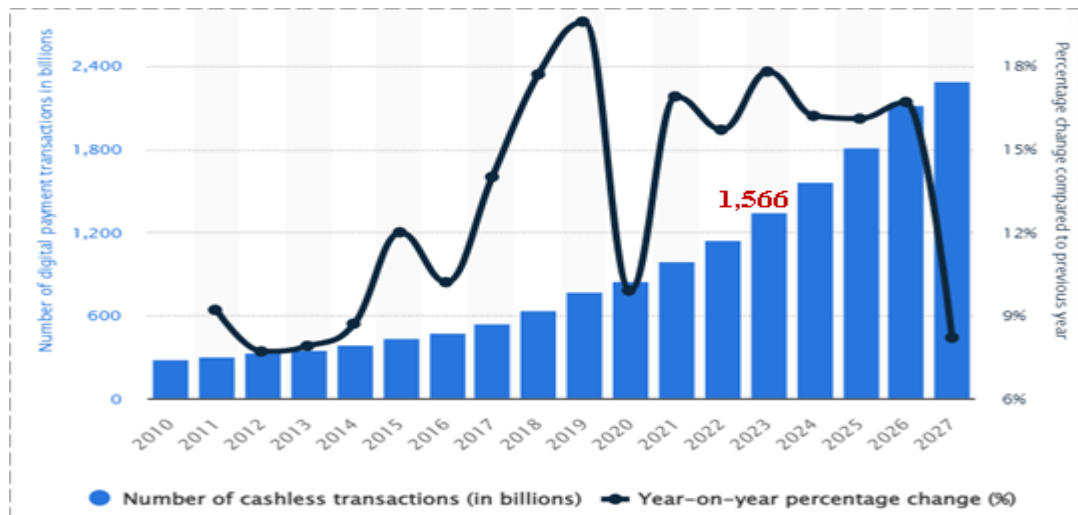


Fig. 13. Number of cashless digital payment transactions worldwide from 2010 to 2023, with forecasts from 2024 to 2027
 Source: Statista (2024b)

Globally, central banks are actively encouraging payment system innovation. These developments have the potential to completely transform business and banking in the future. Further are presented a few of major trends in the domain:

- *Central Bank Digital Currencies (CBDCs)* - a nation's digital version of fiat money, governed by its central bank; is one aspect of innovations in the area, with project like e-CNY (China), *Project Bakong* (Cambodia), and *e-krona* (Sweden);
- *Instant payment systems* which due to the increase in value, increased as well the number of mobile payment apps, like: UPI, PIX, EBS, Faster Payments, MIA.

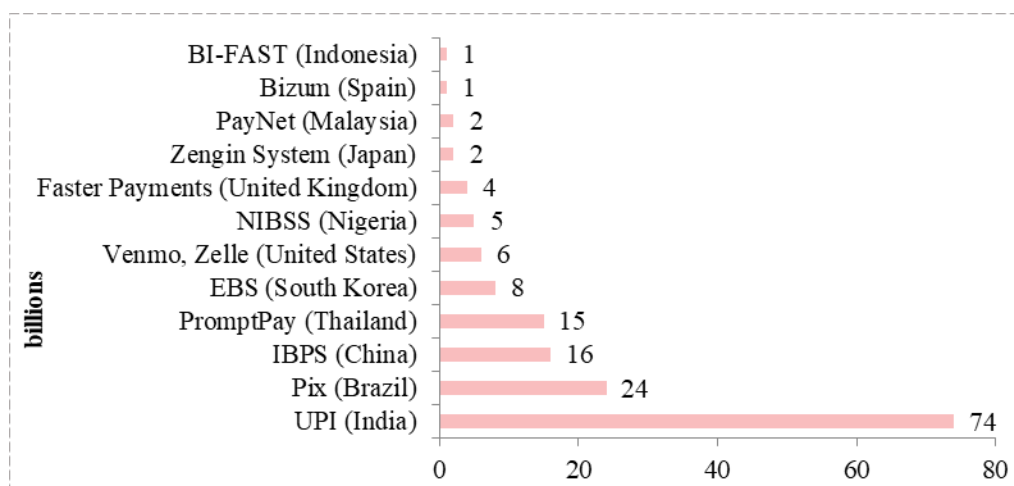


Fig. 14. Brands with the highest number of real-time (instant) payment transactions worldwide in 2022
 Source: Statista (2024c)

In the Asia-Pacific region (Fig. 14), real-time payments were widely used: in India, transactions were nearly five times greater than in China, because RTP is integrated into India's Unified Payments Interface, from which use the country benefits. India tops an enlarged ranking of the number of quick payments made in each country, with a figure larger than the total for 43 other nations. By 2027, India is anticipated to maintain this position. Applications that support A2A payments include UPI in India launched in 2016 and PIX in Brazil launched in 2020, which combined saw close to 100 billion transactions in 2022.

▪ Other innovations: *biometric identification*, *blockchain* (makes it possible for accounting and control procedures to be digitalized, and no one entity owns them. They are available to everyone and cannot be controlled. This reduces costs and speeds up transactions, according to supporters. Additionally, transactions become less dangerous because credit history and asset provenance are recorded as unchangeable elements); *cross-border payments* (the area where the block chain is starting to have an influence: the B2B Connect network from Visa, Liink from JPMorgan Chase, and IBM Block chain World Wire are a few of them) (World Economic Forum, 2023); *SWIFT GPI* (it aims to enhance transparency and efficiency. It is built on top of already-existing messaging protocols and bank payment processing systems), *PaaS Model* (a cloud computing model that provides customers a complete cloud platform, hardware and software infrastructure for developing, running and managing applications without the cost, complexity and inflexibility that often comes with building and maintaining that platform on premises), *open banking* (allows customers to share their financial information securely and electronically with other banks or other authorized financial organizations such as payment providers, lenders and insurance companies); and with the coming of the *Internet of Things*, open banking will become even more useful (when combined, these technologies may allow your smart home to automatically monitor your energy use and switch utility companies to ensure you are receiving the best possible offer).

A SWOT analysis is helpful for delving deeper into the payments chain research to get strategic management data. In fact, it gives a comprehension of the fundamental skills of payments.

Table 2. SWOT analysis for the payments industry

Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Diversity of technological and digital solutions. ▪ Robust ecosystem - a complicated web of actors, tools, procedures, and laws that makes it easier to trade products and services for cash. ▪ Worldwide network - to minimize the procedure and keep cheap transaction costs. ▪ Broad customer base. ▪ Existing infrastructure. ▪ Instant payments. 	<ul style="list-style-type: none"> ▪ Complex systems - incorporate various parties, transactions, data, security, and laws. They must cope with ambiguity, unpredictability, and change in their surroundings and needs. ▪ Protection systems against fraud and risk activities. ▪ Regulations and compliance. ▪ High reliance on the connectivity. ▪ Not able to quickly innovate. ▪ Processing costs.
Opportunities	Threats
<ul style="list-style-type: none"> ▪ Open APIs facilitate more interoperability in the establishment and completion of payments for a wide range of use cases by account service providers. ▪ Foster data sharing and connectivity between participants. ▪ New alliances, or connections between various suppliers that enable them to offer their customers the best payment processing services. ▪ Quick digital shift in the postpandemic period. 	<ul style="list-style-type: none"> ▪ Development of a payment network takes time. ▪ New opportunities and developments in technology. ▪ Currency fluctuations. ▪ Fierce competition. ▪ Regional normative disparities. ▪ New competitors offering services at reduced costs - non-bank suppliers. ▪ Hackers steal money, valuables, rights, or private information.

Source: Authors' elaboration based on the information presented in the research

The SWOT analysis performed identified every opportunity that the participants in the payments chain should take advantage of to increase their market share and establish a competitive edge. The external causes that could cause these performers to quit the profession, on the other hand, are all dangers. Strengths and weaknesses might be considered each player's key competencies when conducting an internal review. First, the organization's resources aid in achieving the goals, which, for the players in the payments chain, are either staying in the business or growing the network through vertical integration. The second is weakness, which refers to organizational constraints or flaws that prevent it from achieving its goals. Weaknesses in the payments system might cause participants to overlook the demands of new clients and to leave the market.

In this dynamic landscape, central banks play a pivotal role in shaping the future of payments, ensuring security, efficiency, and accessibility for all.

8. Security of Digital Payments: Best Cutting-edge Practices

The financial transaction landscape has changed in an era of fast technological innovation and digitization as we observe in the paragraphs above. But as these online payment options gain popularity, industry participants are becoming more aware of the risks that go together with this development. Numerous cybersecurity issues have also emerged as digital payments have grown in popularity. The possibility of fraud, data breaches, and cyberattacks has increased dramatically as more transactions take place online.

The main actions might be taken are:

- *strict access control* - this entails imposing password regulations, employing multi-factor authentication, and limiting the amount of staff members with access to payment systems;
 - *fraud detection systems* - the systems analyse real-time payment data using sophisticated algorithms to spot possibly fraudulent activity;
 - the businesses need to stay current with all applicable *regulations* regarding payment security in order to understand the obligations of laws like the AML and PCI DSS;
 - *ensuring the PCI DSS* - it gives businesses a comprehensive set of rules they can apply to improve the security of customer credit card information. To comply, one must use secure firewalls, encrypt cardholder data, update software often, and limit access to devices and systems, among other 12 requirements. Additionally, it conveys to customers that businesses value the security and privacy of their data, which may strengthen bonds with them;
 - *train employees* - regular staffs training sessions are a good way to make sure they are knowledgeable about the most recent security best practices. Workers need to be taught how to create strong passwords, spot potential scams, and respond to cybersecurity incidents;
 - *3D Secure* - it improves security protocols for both buyers and sellers;
 - *tokenization* - replacing sensitive data with unique identification symbols that retain all the essential information about the data without compromising its security.
- (Sinha, 2023)

9. Conclusion

The see digital payments as a continuous innovating and improving area of modern world due to increasing requirements of people towards reduced costs, faster processing period, increased security, and effortless operation process.

Therefore, the main areas of interest for modern payment systems are e-money, quick payment services, open banking, tokenisation, QR codes, central bank digital currencies and the development of cryptoasset policies.

Knowing that payments are an integral part of the economy their non-processing, can bring the economy to a complete standstill and the Central Bank is responsible for maintaining the safety and integrity of payment systems, by mitigating the threats.

Due to technological advancements such as online banking and mobile payments the bank payment systems are widely exposed to risks of development and the four main risk categories that are considered are credit, liquidity, legal, and operational risk. Special emphasis is paid to security challenges, particularly fraudulent behaviour, given the potential significance of security for user confidence in retail payment systems in general and quick payments in particular.

What about the RM, in order to get more digital and improve the payments, there are some recommendations propose, and:

- First is to ensure the security of consumer data through tokenization, that must be integrated and use in payments.
- Cross-border payments is another suggestion in order to reduce the implication of correspondent banks that imply huge fees and greater period of time to perform them.
- Due to the fact that the use of digital payments is transforming customer behaviour, one method is the incorporation of digital payments into social media sites to perform payment directly.
- By adding biometric authentication, digital payments could be made more efficient, especially the voice recognition method, would help to guarantee that only the authorized user is able to make a payment by adding an additional layer of protection to the transaction.
- The implementation of QR code payments due to its simplicity, would be another solution, because it is easy to use and does not require any specialized equipment.

References

- Bank for International Settlements. (2020). Central banks and payments in the digital era. In *BIS Annual Report* (pp. 67-95). <https://www.bis.org/publ/arpdf/ar2020e3.pdf>
- Bech, M., & Hancock, J. (2020). Innovations in payments. *BIS Quarterly Review*, 21-36. https://www.bis.org/publ/qtrpdf/r_qt2003f.pdf
- BizLaw. (2020, April 30). Dezvoltarea domeniului de plăți din Republica Moldova. Ce obiective a setat BNM [Development of the payment sector in the Republic of Moldova: 78 Ciobu, S., & Tcaci, D. (2024). Development of bank payment systems in the digital economy of the Republic of Moldova. *Economy and Contemporary Society*, 29, 61-81.

- Objectives set by the National Bank of Moldova]. <https://www.bizlaw.md/dezvoltarea-domeniului-de-plati-din-republica-moldova-ce-obiective-a-setat-bnm>
- Cebanu, I., & Reuțki, C. (2022). Regimul juridic al sistemelor de plăți cu carduri de plată [Legal framework of payment card systems]. In *Proceedings of the 2nd Conference “Pro-Business Together: Tendințe, Provocări, Soluții”* (pp. 117-120). Kishinev: Totex-Lux. https://ceef.md/storage/public/files/editia_2.pdf
- Chidananda (2024, August 12). 12 types of payment methods, meaning and how to accept them in 2024?. <https://razorpay.com/blog/different-types-of-payment-methods>
- Ciobu, S., & Luchian, I. (2011). Improvement in the functioning of the payment system of the Republic of Moldova through innovative process. In *Proceedings of the International Conference “Republica Moldova: 20 de Ani de Reforme Economice”* (Vol. 1, pp. 113-117). Kishinev: Academy of Economic Studies of Moldova.
- Comerica Bank. (2024). Digital payment security risks and best practices. <https://www.comerica.com/insights/business-finance/digital-payment-security-risks-and-best-practices.html>
- Curry, D. (2024). Mobile payments app revenue and usage statistics (2024). <https://www.businessofapps.com/data/mobile-payments-app-market>
- Delort, D., & Garcia, J. A. (2023, April 17). Innovation in payments: Opportunities and challenges for EMDEs. <https://blogs.worldbank.org/en/psd/innovation-payments-opportunities-and-challenges-emdes>
- Federal Reserve Bank. (2024). What is ISO® 20022 and why does it matter?. <https://www.frbservices.org/financial-services/fednow/what-is-iso-20022-why-does-it-matter>
- Ministry of Justice of the Republic of Moldova. (2019). Regulament cu privire la sistemul automatizat de plăți interne, aprobat prin Hotărârea Comitetului Executiv al Băncii Naționale a Moldovei nr. 179 din 27.06.2019 [Regulation Regarding the Automated Internal Payment System, approved by the Decision of the Executive Committee of the National Bank of Moldova No. 179 from 27.06.2019]. *Official Gazette of the Republic of Moldova*, No. 223-229, Article 7270 of July 12, 2019. https://www.bnm.md/files/Reg_%20SAPI_compilat.pdf
- National Bank of Moldova. (1995). Law on the National Bank of Moldova No. 548-XIII of July 21, 1995 (in force as of October 12, 1995). *Official Gazette of the Republic of Moldova*, No. 56-57, Article 624 of October 12, 1995. <https://tinyurl.com/4zdmjzn5>
- National Bank of Moldova. (2022). Raport privind evoluția infrastructurilor pieței financiare din Republica Moldova. Anul 2022 [Report on the Evolution of Financial Market Infrastructures in the Republic of Moldova: Year 2022]. https://bnm.md/files/Raport_anual_2022_publicat_2.pdf
- National Bank of Moldova. (2023a). Raport anual 2022 [Annual Report 2022]. https://bnm.md/files/Raport_anual_2022%20ISBN-.pdf

- National Bank of Moldova. (2023b). Raport privind evoluția infrastructurilor pieței financiare din Republica Moldova. Anul 2023 [Report on the Evolution of Financial Market Infrastructures in the Republic of Moldova: Year 2023].
https://www.bnm.md/files/Raport_anual.pdf
- National Bank of Moldova. (2024). Raport anual 2023 [Annual Report 2023].
https://www.bnm.md/files/RA_2024_ISBN.pdf
- National Bank of Moldova. (n.d.a). Raport: Carduri emise de către prestatorii de servicii de plată din Republica Moldova [Report: Cards Issued by Payment Service Providers in the Republic of Moldova]. <https://www.bnm.md/bdi/pages/reports/dsp/DSP3.xhtml>
- National Bank of Moldova. (n.d.b). Raport: Numărul și valoarea tranzacțiilor efectuate cu carduri de plată din Republica Moldova [Report: Number and Amount of Transactions Carried Out with Payment Cards from the Republic of Moldova].
<https://www.bnm.md/bdi/pages/reports/dsp/DSP4.xhtml>
- National Bank of Moldova. (n.d.c). Raport: Informație privind activitatea cu carduri de plată a prestatorilor de servicii de plată din Republica Moldova (per prestator) [Report: Information Regarding the Activity of Payment Service Providers with Payment Cards from the Republic of Moldova (per Provider)]
<https://www.bnm.md/bdi/pages/reports/dsp/DSP2.xhtml>
- National Bank of Moldova. (n.d.d). Raport: Numărul utilizatorilor înregistrați în sisteme automatizate de deservire la distanță (SADD) [Report: Number of Users Registered in Automated Remote Service Systems (ARSS)].
<https://www.bnm.md/bdi/pages/reports/dsp/DSP5.xhtml>
- Parliament of the Republic of Moldova. (2012). Lege cu privire la serviciile de plată și moneda electronică, nr. 114 din 18.05.2012 [Law on Payment Services and Electronic Money, No. 114 of May 18, 2012]. *Official Gazette of the Republic of Moldova*, No. 193-197, Article 661 of September 14, 2012. https://www.bnm.md/files/Legea%20114-2012_RO.pdf
- Sinha, D. (2023). Navigating the future of digital payments: Efficiency, security, and compliance.
<https://www.tradefinanceglobal.com/posts/baft-navigating-the-future-of-digital-payments-efficiency-security-and-compliance> (Accessed 27.03.2024).
- Srivastava, A., & Řežábek, P. (2022). Impact of digital payments on the economic growth of a country. *International Journal of Economic Sciences*, 11(1), 85-104.
<https://www.eurrec.org/ijoes-article-117017>
- Statista. (2023). The five countries with the highest number of real-time payment (RTP) transactions worldwide in 2023. <https://www.statista.com/statistics/1276491/biggest-real-time-payment-countries-worldwide/>
- Statista. (2024a). Market size of mobile wallet transactions in various regions worldwide in 2020 with forecasts from 2021 to 2025. <https://www.statista.com/statistics/1227576/mobile-wallet-transactions-worldwide/>

- Statista. (2024b). Number of cashless digital payment transactions worldwide from 2010 to 2022, with forecasts from 2023 to 2027. <https://www.statista.com/statistics/265766/number-of-cashless-transactions-worldwide/>
- Statista. (2024c). Brands with the highest number of real-time (instant) payment transactions worldwide in 2022. <https://www.statista.com/statistics/1416030/biggest-real-time-payment-providers-worldwide/>
- Thales. (2021, October 28). 7 game-changing innovations that will re-boot banking. <https://www.thalesgroup.com/en/worldwide-digital-identity-and-security/bank-payment/magazine/7-game-changing-innovations-will-re>
- World Economic Forum. (2023). Future of payments: How central banks are driving innovation. <https://www.weforum.org/agenda/2023/06/future-of-payments-how-central-banks-are-driving-innovation>