

**Anna IWĄNCZUK-KALISKA, Associate Professor**  
Department of Money and Banking,  
Poznań University of Economics and Business  
e-mail: anna.iwanczuk-kaliska@ue.poznan.pl  
ORCID: 0000-0002-9540-1004

DOI: 10.15290/oes.2022.02.108.06

## TRENDS IN PAYMENT INTERMEDIATION – GLOBAL PERSPECTIVE ON THE ROLE OF BANKS AND NON-BANKS<sup>1</sup>

### Summary

*Purpose* – The aim of the paper is to assess the role of banks and non-banks in payments from a global perspective using a comprehensive approach. The considerations are also focused on the determinants of possible changes in this area in the future.

*Research method* – The research methods applied in the study include the literature review and the critical analysis of available empirical research results in the field of payment intermediation. The analysis based on desk research is focused on changes in payments trends observed worldwide.

*Results* – The research leads to the conclusion that despite the significant role of nonbank entities on the payment services market, banks continue to be important elements of payment systems. There are no commonly used solutions that are fully separate from banking systems, and there is no doubt that this will not change in the nearest future. However, payment innovations combined with changes in regulations and central bank strategies may alter the use of both bank money and the banking infrastructure in payments.

*Originality / value / implications / recommendations* – The paper contributes to the discussion on trends leading to a change in the role of banks and an increasing role of non-banks in payment intermediation. It investigates the problem from a global perspective and using a comprehensive approach. Its novelty lies also in the approach based on four distinguished stages of the change of the banks' role in payment systems.

**Keywords:** payment intermediation, payment systems, banks, non-banks

**JEL Classification:** G21, G23, G28, E58

### 1. Introduction

Contemporary financial systems include different types of institutions, a growing number of which operate outside the banking system [Unger, 2016]. By using information technology and gaining customers' trust, they are able to fulfill many

---

<sup>1</sup> The project financed within the Regional Initiative for Excellence programme of the Minister of Science and Higher Education of Poland, years 2019–2022, grant no. 004/RID/2018/19, financing 3,000,000 PLN.

Article received on 20.12.2021, accepted on 21.05.2022.

consumers' banking needs. This takes business away from banks and leads to so-called "banking without banks" [Worthington, Welch, 2011; Kucinkas, 2015]. The traditional, principal role of universal banks focuses on lending and taking deposits, while another important function is the provision of payment services. Moreover, claims on banks are commonly used as means of payment, which is a unique feature that distinguishes them from other financial institutions. Kahn and Roberds [2009] rightly argue that banks serve an essential role as providers of payment services because they are able to transfer liquid claims quickly and cheaply and with a minimum of legal uncertainty.

Banks have always been the principal entities of payment systems. However, contemporary payment systems are characterized by the growing visibility and prominence of non-banks [Hoening, 2007; Lowe, 2007; Sullivan, Wang, 2007]. The aim of this paper is to assess the role of banks and non-banks in payments from a global perspective and using a comprehensive approach. The considerations are also focused on determinants of possible changes in this area in the future.

As part of the research process, the following thesis was posed: assuming no changes in the foundations of banking and monetary systems occur, there is no risk of banks completely losing their role in payments. The research methods applied in the study include the literature review and the critical analysis of available empirical research results in the field of payment intermediation. The analysis based on desk research is focused on changes in payments trends observed worldwide.

The paper proceeds as follows. Section 2 surveys the literature and research on the role of non-banks in payments. Section 3 discusses changes in payment systems observed worldwide and attempts to answer the question about the future role of banks and non-banks in payment intermediation. The last section provides conclusions and final remarks.

This paper contributes to the discussion on trends leading to a change in the role of banks and an increasing role of non-banks in payment intermediation. Most of the studies conducted so far concentrated on selected payment means (cash, deposit money, central bank money), selected payment methods (e.g. card or mobile payments) or the stages of payment process (e.g. provision of services to customers, clearing or interbank settlement), whereas this paper investigates the role of banks and non-banks in payments using a comprehensive approach. The conclusions are based on analysis and assessment of worldwide changes in payment systems. The novelty of the research lies also in the approach based on four distinguished stages of a change of banks' role in payment systems.

## **2. Literature and research on the role of non-banks in payments**

The literature and studies on the role of banks in payments assume that payment services offered by banks are a by-product of their intermediary and liquidity functions [Heffernan, 2005]. Banks and the banking sector are examined in the context of the provision of payment services and settlement [Bolt, Humphrey, 2014; Polasik,

Piotrowski, 2016]. A great number of studies assume that payment services are supplied mainly through the infrastructure of the banking system. Some authors, including Millard, Saporta [2007] and Kahn, Quinn, Roberds [2014], refer to the role of the central bank in the payment system as an overseer, catalyst and operator of the interbank settlement system.

At the beginning of the twenty-first century a growing prominence and role of non-banks in payment systems, forced a change in the approach to the analysis of intermediation in payments. Researchers continued to recognize traditional roles of banks in payments, but began to concentrate on the increasing role of non-banks in retail payments. This section reviews the literature and research in the field of payment intermediation focusing on the role of non-banks.

The researchers adopt a rather uniform definition of a “non-bank” as any entity that is involved in the provision of retail payment services whose main business is not related to taking deposits from the public and using these deposits to grant loans. In the European context, non-banks include all entities that are not fully licensed as credit institutions, in particular electronic money institutions, payment institutions and money remittance service providers. Deeper analysis reveals that non-banks also include technical service providers: data processors, network managers, security vendors and other entities e.g. mobile phone companies and large retailers engaged in payments.

Bradford, Davies and Weiner [2003] analysed the issue of non-banks in the US payment system. They examined non-bank participation on two levels: payment activities in which non-banks are involved, and the roles non-banks play in specific transaction types. They ascertained that non-banks are an integral part of the payment systems, and that they perform functions at all stages of the payments process, being involved in both traditional and emerging payment instruments. The authors observed that non-banks are not usually directly involved in settlement activities. Instead, they have a relationship with a bank or other financial institution for settlement purposes. These relationships are often highly complex and intertwined. The authors concluded that “the importance of non-banks in the payments systems is likely to increase even more in the period ahead. As technology advances, outsourcing escalates, and paper increasingly gives way to electronics, non-banks will become even more prevalent than today” [Bradford, Davies, Weiner, 2003, p. 63].

The presence of non-banks in payment systems was also studied by staff at the European Central Bank and the Federal Reserve Bank of Kansas City [*Nonbanks...*, 2007]. They focused on electronic (non-paper) retail payment services in the European Union and the United States. They confirmed the findings of the research by Bradford, Davies and Weiner [2003] that non-banks are present at all stages of the payments chain. They concluded that non-banks appear the most prominent in the United States, but they are noticeable in many European countries as well. They observed an increasing importance of non-banks in all the countries analysed. The authors pointed out the potential impacts of a rising presence of non-banks on retail payment systems and public policy; these include: heightened innovation, more competition, easier end-user access, a changing risk profile. They also suggested that

current regulatory frameworks should be evaluated, possible trade-offs between efficiency and risk should be studied, and risk profiles of innovative payment solutions and the complexities of payment technologies and third-party business linkages should be examined [Nonbanks..., 2007, p. 46].

The study on non-banks in European and American payment systems was continued, and resulted in another paper by staff at the European Central Bank and the Federal Reserve Bank of Kansas City [Bradford et al., 2009]. The purpose of their paper was to explore various types of risk associated with activities along the payments chain, for example: settlement risk, operational risk and reputational risk. The authors assessed the role of non-banks as being prominent in the United States and high in several of the surveyed European countries. They noticed differences between the United States and Europe concerning the role of non-banks: in the USA, they are important across all payment instruments and along the entire processing chain, whereas in Europe, this is true for cards in most countries and for most payment instruments in some countries. They observed that in this area, Europe is not uniform. They concluded that the role of nonbank entities “has a margin for further growth in Europe, driven by the SEPA project, the restructuring and consolidation of the payments processing industry, and the growth of payment instruments whose processing models rely more heavily on third-party processors” [Bradford et al., 2009, p. 36]. The authors predicted that the role of non-banks would increase as a result of changes in the regulatory environment (Payment Services Directive). In general, they found that non-banks have increasingly gained access to payment systems (either directly, or indirectly in the form of technical access due to outsourcing), and that has resulted in more complex networks of systems, relations and interactions.

Economides [2007] discussed various aspects of the vertical relationship between merchants and payment networks. He considered the features of the payment services market, including, among others, the two-sided nature of the payment system and the existence of network effects. He observed the incentives of merchants to extend vertically into payment schemes. He noted that “this incentive is maximized when there is significant market power in payments systems and merchants are not sufficiently compensated for the business they bring to the network” [Economides, 2007, p. 19].

Chande [2008] provides an overview of different kinds of non-bank retail payments schemes in Canada. He notes that non-bank retail payments systems are not subject to the same regulatory oversight as banks, and, therefore, discusses the main risks associated with these services. He considers users’ and providers’ incentives to manage the associated risks and the potential direct and indirect costs of regulation in this area, including the impact on competition, innovation, efficiency and choice. He argues that “non-bank retail payments systems provide customers with a wider variety of payment options, but they also place competitive pressure on banks to develop more innovative and efficient payment services” [Chande, 2008, p. 34].

International institutions have also engaged in research concerning the role of non-banks in payments. The Committee on Payments and Market Infrastructures

(Bank for International Settlements) has, similarly to other researchers, concentrated on non-banks in retail payments. In their report published in May 2012 [BIS, 2012], which covered innovations in payments, the Committee identified the trend of the increasing role of non-banks in retail payments. In the report *Non-banks in retail payments* [BIS, 2014], the Committee adopted a categorisation involving the following five stages of the payment process: pre-transaction stage, authorisation stage, clearing stage, settlement stage and post-transaction stage. The Working Group used the fact-finding method in their investigations. They aimed to assess how far non-banks are involved in different payment instruments and in different stages of the payment chain, and to identify the key characteristics of non-banks in retail payments and the regulatory measures implemented in various jurisdictions relating to non-banks.

The Committee distinguished four types of non-banks [BIS, 2014, p. 9]:

- front-end providers, which provide an interface between end users of payment services;
- back-end providers, which provide specialised back-end services to banks mainly via outsourcing arrangements;
- operators of retail payment infrastructure, which specialise in back-end clearing and settlement services;
- end-to-end providers, which combine providing front-end services to end users with clearing and settlement services.

The authors of the report argue that “the degree to which non-banks are involved in retail payments varies widely within jurisdictions” [BIS, 2014, p. 39]. The differences have been especially observed in relation to:

- the relative importance of non-banks on different stages of the payment process,
- the implications of their role in terms of risk and efficiency,
- their potential role in relation to the financial inclusion and promotion of innovations,
- the regulatory and oversight framework.

The report concludes that “due to growing importance of non-banks in the provision of retail payment services, it seems appropriate to seek a better understanding of the changing role of non-banks and its implications” [BIS, 2014, p. 39].

The above-mentioned studies prove that non-banks play multiple roles in the payments chain. However, the authors do not usually differentiate between the technical and financial functions performed by non-banks, or their importance. Instead, they consider mainly their operational role. They also recognize the problem that it is only banks and other supervised institutions that are able to provide data for analysis.

A few years ago, institutions (especially central banks) and researchers started to share ideas about the future direction of changes in payments in conjunction with the idea of cryptocurrencies and central bank digital money [e.g. Bech, Garratt, 2017; Bordo, Levin, 2017; Berentsen, Schar, 2018; Sveriges Riksbank, 2018; ECB, 2019]. CBDC is central banks’ answer to the emergence and development of cryptocurrencies, which are treated as competition for central banks and banking systems

[Iwańczuk-Kaliska, 2018, p. 189]. A detailed analysis of the literature on these concepts is beyond the scope of this paper, but it is worth recalling a few issues raised by the authors related to the role of banks and non-banks in payments.

In their report on digital currencies [BIS, 2015], the Committee on Payments and Market Infrastructures draws attention to the activity of non-banks in developing and operating digital currencies and distributed ledger mechanisms. The authors claim that “development of digital currencies based on the use of a distributed ledger has been mostly driven by private sector non-banks. For the most part, banks have tended not to engage directly with digital currency intermediaries”. However, they observed that private banks had started to explore potential business opportunities arising from digital currencies and distributed ledgers, which include “offering their customers interfaces to digital currency exchanges or exploring the use of decentralised ledgers for back office applications” [BIS, 2015, p. 7].

Barrdear and Kumhof [2016] studied the macroeconomic consequences of issuing the central bank digital currency (CBDC) as a universally accessible and interest-bearing central bank liability implemented via distributed ledgers, which competes with bank deposits as a medium of exchange. The results of their research show that this innovation will definitely change the role of banks as providers of a monetary transaction medium that would compete with CBDC in the real world [Barrdear, Kumhof, 2016, p. 65]. In the opinion of the authors, CBDC would influence the whole payments market, including all its participants.

Raskin and Yermack [2016] claim that central banks should be careful in introducing the central bank digital currency as it carries significant risks for the rest of the financial system. The authors argue that a sovereign digital currency could have dramatic implications, not only for payments, but for the whole banking system by shortening the distance between citizens and central banks and removing the need for the public to keep deposits for payment purposes [Raskin, Yermack, 2016, p. 15].

Engert and Fung [2017], who address the question of whether a central bank should issue the digital currency that could be used by the general public, claim that CBDC could facilitate access to the central bank’s balance sheet for non-banks, thus “making it easier for these firms to enter the payments industry, promoting contestability” [Engert, Fung, 2017, p. 7].

In their research, Kumhof and Noone [2018] ask a great many questions about the consequences of introducing the central bank digital currency [CBDC]. They claim that the CBDC concept raises many fundamental questions about the structure and operation of the monetary and financial system. They argue that discussions about the potential impact of CBDC on banks and non-bank payment services providers should start with a clear description of how a CBDC system would operate [Kumhof, Noone, 2018, p. 35].

An extensive study on CBDC was completed by the Committee on Payments and Market Infrastructures and the Markets Committee [BIS, 2018]. The authors analysed, among others, its potential implications for payment systems. They noted that in the past, central banks tended to restrict access to their accounts. In recent years, access has been granted to some nonbank institutions, and the idea of CBDC

in a form that extends this access to all (account-based CBDC) will revolutionize payment services and reduce and even eliminate banks and other intermediaries on the payment market.

Recent publications and studies are based on the growth prospects for FinTech. An IMF report in 2019 covered different FinTech innovations in retail payments. The authors noted that innovations such as mobile applications, APIs and tokenization, unbundled payment services from the underlying bank and payment accounts and enabled non-banks to offer payment services [IMF, 2019, p. 25]. They claimed that access to payment infrastructures for non-banks required an appropriate legal framework for financial regulation. They also considered that “regulatory barriers in some jurisdictions inhibit nonbank entities from offering payment services (e.g. by not allowing them to offer services, or by impeding access to payment and settlement infrastructures)”. On the other hand, in some countries enhancements to national payment systems have enabled incumbents and nonbank entities to adopt new business models in payment services based on the ultimate settlements taking place in the traditional banking system [IMF, 2019, p. 37].

The results of a survey carried out by Capgemini and presented in their World Payments Report [Capgemini, 2020] show that banks are collaborating with FinTechs to boost their offer, and are leveraging partnerships to speed up innovation. In conditions of the increasing role and market share of non-banks, traditional banks’ objective is to find and reinforce their place in the payment industry ecosystem.

According to Thakor [2020] the biggest disruptive potential of FinTech in payments services is connected with cryptocurrencies. Analysing the impact of FinTech on banking, he claims that “there is little doubt that digital currencies will eventually replace cash, but the open questions are when and in what form will central banks embrace such currencies as part of the payment system” [Thakor, 2020, p. 12]. Innovators of new forms of payments are indeed in different ways forced to coordinate their plans with central banks as catalysts in payment systems.

Broby [2021] concentrates on the future business models of banks and claims that the digital transformation that financial technology brings about reduces the advantage of banks as incumbents towards new players on the payments market. He notes that in the evolving competitive landscape including challengers, niche players and social media platforms, the banks of the future will have to prepare new strategies for their payment services.

Some authors concentrate in their analysis on further steps of FinTechs in payment services markets. Alcazar and Bradford [2021] find out that FinTechs expand their offerings of “buy now, pay later” (BNPL) products and banks usually react by engaging with, acquiring, and competing with BNPL providers. Considering the whole activity of banks, these products are also disruptive to their lending operations [Gerrans, Baur, Lavagna-Slater, 2021].

The content of the above papers shows that contemporary changes in payment systems raise many questions about the future of central bank money and the role of banks as payment intermediaries. These issues are at the same time a challenge for researchers. Table 1 summarizes the literature and studies concentrating on the role

of non-banks in payments. It divides the papers into three groups and contains general findings.

**TABLE 1.**  
**Literature and research on the role of non-banks in payments**

Study	General findings
<b>Group 1 – focus on non-banks in payments</b>	
Bradford, Davies, Weiner [2003]	Non-banks perform functions at all stages of the payments process and banks remain involved in settlement activities.
<i>Nonbanks...</i> [2007]	Non-banks are present at all stages of the payments chain but to a different extent in individual countries.
Chande [2008]	Non-bank payment systems force innovations in the payment services market.
Bradford et al. [2009]	Non-banks in the US and in part of Europe play prominent role in all or most payment instruments and the main role in card payments all over the world.
Economides [2007]	Merchants tend to extend vertically into payments schemes.
BIS [2012], BIS [2014]	The degree of non-banks involvement in retail payments is growing but varies within countries.
<b>Group 2 – focus on cryptocurrencies and CBDC in payments</b>	
BIS [2015]	Development of digital currencies is driven by non-banks; banks start to explore business opportunities in this area.
Barrdear, Kumhof [2016]	CBDC will definitely change the role of banks and non-banks as regards payments.
Raskin, Yermack [2016]	CBDC will have serious implications for the foundations of the banking system including the role of banks in terms of payments.
Enger, Fung [2017]	CBDC could facilitate access of non-banks to settlement in central bank money.
Kumhof, Noone [2018]	The implications of CBDC for banks and non-banks depend on its design.
BIS [2018]	Account-based CBDC will eliminate banks and other intermediaries on the payment market.
<b>Group 3 – focus on FinTech in payments</b>	
IMF [2019]	Technical innovations enable non-banks to offer payment services but do not give the access to the whole payment infrastructure (ultimate settlement) due to regulations.
Capgemini [2020]	Banks are collaborating with FinTechs in the payments area.
Thakor [2020]	Innovators of new forms of payments have to coordinate their plans with central banks as catalysts.
Broby [2021]	Banks lose their advantages due to the growing use of financial technology by other providers and have to prepare new strategies for their payment services.



Study	General findings
Alcazar, Bradford [2021]; Gerrans, Baur, Lavagna-Slater [2021]	FinTechs compete with banks in combined payment-lending services.

Source: own elaboration.

Recently, a growing number of studies have examined the issue of payment intermediation and the operation of payment mechanisms, referring to the term PayTech, e.g. Chishti et al. [2020], Polasik et al. [2020]. This concept includes payments made using modern technologies. However, it is worth noting that technology was combined with payments in earlier studies (on FinTech). The findings of the papers on PayTech will be considered in the next section.

### **3. Prospects for the future role of banks and non-banks in payment intermediation**

The use of traditional payment instruments – i.e. credit transfers, direct debits, bank credit and debit cards – is still dominant in retail payments [BIS, 2019]. These instruments are more and more frequently offered by non-banks using payment innovations. However, bank claims remain the main means of payment, and the process of payment requires the transfer of bank money.

Contemporary technologies allow for the differentiation of delivery channels for payment services. These technologies are more and more available to non-banks. Therefore, we may observe diffusion of payment services based on the use of mobile phones, especially in countries where banks have, for various reasons, been unable to provide payment services to certain segments of the population [BIS, 2012, p. 4].

There is a specific situation in the European Union due to Payment Services Directive, which has sanctioned the activities of non-bank payment service providers and has created formal conditions for their development. The number of non-bank payment institutions has steadily increased in recent years. These institutions fill a niche in the market in terms of cash operations, they perform transactions related to payment instruments offered by banks, or create their own instruments and methods of payment.

In terms of retail payment services, banks are becoming less and less visible. The payment market is dominated by the offer of entities from the so-called PayTech group. PayTechs are more agile than banks and thus are able to deploy new technologies faster [Davies et al., 2016; Jagtiani, John, 2018; Vives, 2019]. At the national (or regional) level their development depends on administrative and legal tools [Boyer, Kempf, 2020]. The study of Polasik et al. [2020] have brought the evidence of the positive impact of PSD2 on the development of the PayTech sector in European countries. It has also revealed that the PayTech sector is still very small in comparison to the size of the traditional payments markets in Europe.

An analysis limited to retail payments could lead to the conclusion that banks and their services are not necessary to meet the payment needs of individuals and enterprises. However, we cannot forget about two important issues. The first is that the payment process consists of front- and back-office stages. The latter includes the transfer of money, usually bank money. Thus, the settlement requires banks, and this will not change for as long as there is no other common payment means than bank money<sup>2</sup>. The second issue concerns the infrastructure of large-value payments, which is used to transfer money between institutional financial market participants. This infrastructure is organized by the banking sector, including central banks as settlement agents. This is so far the only solution which ensures the safety and efficiency of wholesale payments.

The above considerations allow to distinguish four stages of change in banks' role in payment systems for further examination, i.e.:

- a) payment systems without cash,
- b) payment systems without bank accounts,
- c) payment systems without bank money,
- d) payment systems without banks.

The first stage implies an increase in the role of banks due to a transition to the non-cash forms of payment. The next three stages have far-reaching implications for the reduction of banks' role in payment systems.

Theoretical and empirical studies in the last years have predicted the reduction of cash usage in payment transactions due to the dissemination of deposit or electronic money [Mooslechner, Stix, Wagner, 2006; Garcia-Swartz, Hahn, Layne-Farrar, 2006a, 2006b; Leinonen, 2008]. However, despite the popularity of noncash money and electronic payment instruments, there is still demand for cash. It lies in the nature of money, which apart from its function as a means of payment, performs a value storage function. This can lead to the conclusion that cash will not disappear in the nearest future, but its role in payments will be reduced. We cannot expect that it will be completely eliminated as a means of payment. In order for that to happen, a total ban on the use of cash for payments would have to be introduced. This would also entail the lack of motivation to store value in this form.

The payment process requires the transfer of value stored in a bank account, another payment account or, for electronic money, on any device. There are many payment mechanisms that are not operated by banks, but which are based on transfer between bank accounts. There are also payment solutions which are not based on accounts serviced by banks (e.g. payment accounts), but their functionality is based on the possibility of transferring value from or to bank accounts. Based on these assumptions, it may be claimed that some stages of payment mechanisms may not engage bank accounts, but that it is unlikely that in the near future payment systems as a whole will operate without any involvement of bank accounts.

---

<sup>2</sup> Marszalek [2014, p. 148] supports the opinion that to date, the final settlement in private payment systems has to take place through banks.

Money represents an obligation that rests on different issuers. The main issuers of money are central banks, which provide central bank money in the form of both cash and liabilities (for banks), and commercial banks, which generally issue money in the form of deposit liabilities. Bank money can be contrasted with money issued by other entities. In contemporary economies, the latter group is represented most notably by e-money institutions. Bank money, including central or commercial bank money, as well as e-money is traditionally perceived as “money” in a specific currency. In most jurisdictions, the issuing of e-money is restricted to authorized institutions, including banks. E-money balances are denominated in the same currency as central bank or commercial bank money, and can easily be exchanged at par value for such currencies or redeemed in cash [BIS, 2015, pp. 4–5]. Thus, this form of money is not separate from the banking system.

In many countries nowadays, some parts of payment systems (payment mechanisms or schemes) operate entirely without cash, but all of them require bank accounts, bank money or bank infrastructure, at least for settlement purposes. The exceptions in this area are payment mechanisms or schemes based on virtual/digital private currencies. However, they are not supported by governments and not widely accepted. We cannot expect this to change soon, thus banks will remain involved in payment intermediation over the next years.

#### 4. Conclusions

The above considerations concerning the distinguished stages of a reduction of banks’ role in payment systems lead to the conclusion that there are no commonly used solutions that are fully separate from banking systems, and there is no doubt that this will not change in the nearest future. This conclusion does not require modification despite the existence of individual payment mechanisms operating without banks, i.e. virtual currency schemes such as Bitcoin, as these are not fully considered to be money from a legal perspective. They may substitute banknotes and coins and e-money in certain payments, but for now, their usage for payments remains limited [BIS, 2018].

Banks continue to enjoy special advantages in payment intermediation over non-banks. These advantages include, among others: full access to wholesale payment systems, an ability to manage liquidity on a large scale, and an impact on systemic risk reduction within the existing institutional framework. However, as already noted, payment innovations have eroded banks’ advantages as payment intermediaries, subjecting them to competition from non-bank payment institutions and payment schemes. Moreover, payment innovations have blurred the distinctions between banks and non-banks [Szpringer, Szpringer, 2015, p. 16]. It is highly probable that they will gradually alter the scope and use of both bank money and the infrastructure of banking systems. Technological advances that open up new possibilities for payment and settlement mechanisms are drivers for the development of new payment schemes which may force banks to alter their business models. These

models more and more often include interactions with technology companies such as FinTechs and BigTechs.<sup>3</sup> On the other hand banks strategies may be based on cooperation among banks involved in the creation of payment innovation [Blach, Klimontowicz, 2021].

The contemporary payments trends observed from the customer's perspective include PayTechs distinguishable from banks by their ability to implement innovations faster than traditional banks, and thus address customers' expectations better. It is highly probable that the future of the retail payments market will be dominated by entities from this group. Banks cannot remain passive in the area of business payments, including cross-border transactions, so as not to lose the opportunity to expand with the offer on this market.

Currently, the position of banks in some payment areas is at high risk (e.g. instant payment services for individual customers). In others, banks consciously share their market potential with other entities (e.g. in payment card transactions, outsourcing of payment support processes). The role of banks in the area of business payments, including high-value payments, is the least at risk. This is a consequence of, among others, limited access to central bank digital money for non-banks. Further steps towards opening up banking by introducing CBDCs or expanding access to high-value payment systems will change foundations of banking and monetary systems. Only under these conditions banks may completely lose their role in payments.

## References

- Alcazar J., Bradford T., 2021, *The Rise of Buy Now, Pay Later: Bank and Payment Network Perspectives and Regulatory Considerations*, Federal Reserve Bank of Kansas City.
- Barrdear J., Kumhof M., 2016, *The macroeconomics of central bank issued digital currencies*, "Staff Working Paper", No. 605, Bank of England.
- Bech M., Garratt R., 2017, *Central bank cryptocurrencies*, "BIS Quarterly Review", September.
- Berentsen A., Schar F., 2018, *The case for central bank electronic money and the non-case for central bank cryptocurrencies*, Federal Reserve Bank of St. Louis Review, Second Quarter.
- BIS, 2012, *Innovations in retail payments*, Committee on Payment and Settlement Systems.
- BIS, 2014, *Non-banks in retail payments*, Committee on Payments and Market Infrastructures.
- BIS, 2015, *Digital currencies*, Committee on Payments and Market Infrastructures.
- BIS, 2018, *Central bank digital currencies*, Committee on Payments and Market Infrastructures, Markets Committee.

---

<sup>3</sup>These interactions and the factors affecting them were examined by Harasim [2021].

- Błach J., Klimontowicz M., 2021, *The Determinants of PayTech's Success in the Mobile Payment Market – The Case of BLIK*, "Journal of Risk and Financial Management", Vol. 14(9), pp. 1–23.
- Bolt W., Humphrey D., 2014, *Competition in bank-provided payment services*, "Journal of Financial Market Infrastructures", Vol. 2(4), pp. 21–51.
- Bordo M., Levin A., 2017, *Central bank digital currency and the future of monetary policy*, "NBER Working Papers", Vol. 23711.
- Boyer P.C., Kempf H., 2020, *Regulatory arbitrage and the efficiency of banking regulation*, "Journal of Financial Intermediation", Vol. 4.
- Bradford T., Davies M., Weiner S., 2003, *Non-banks in the payments system*, Federal Reserve Bank of Kansas City.
- Bradford T., Hayashi F., Hung C., Rosati S., Sullivan R.J., Wang Z., Weiner S.E., 2009, *Non-banks and risk in retail payments: EU and U.S.*, [in:] *Managing information risk and the economics of security*, Johnson, E.M. (ed.), Springer Publishing.
- Broby D., 2021, *Financial technology and the future of banking*, "Financial Innovation", Vol. 7, pp. 1–19.
- Capgemini, 2020, *World Payments Report 2020*, Capgemini Research Institute.
- Chande N., 2008, *A survey and risk analysis of selected non-bank retail payments systems*, Bank of Canada Discussion Paper, November.
- Chishti S., Craddock T., Courtneidge R., Zachariadis M. (eds.), 2020, *The PAYTECH Book: The Payment Technology Handbook for Investors, Entrepreneurs, and FinTech Visionaries*, John Wiley & Sons.
- Davies S., Jackett D., Kashyap M., Nicolacakis D., Qureshi M., Shipman J., 2016, *Customers in the spotlight – how FinTech is reshaping banking*, Global FinTech Survey.
- ECB, 2019, *Exploring anonymity in central bank digital currencies*, "In Focus", Vol. 4.
- Economides N., 2007, *Non-banks in the payments system: vertical integration issues*, New York University Law and Economics, Working Papers, Vol. 112.
- Engert W., Fung B., 2017, *Central bank digital currency: motivations and implications*, Bank of Canada Staff Discussion Paper, November.
- Garcia-Swartz D., Hahn R.W., Layne-Farrar A., 2006a, *The move toward a cashless society: a closer look at payment instrument economics*, "Review of Network Economics", Vol. 5(2), pp. 175–198.
- Garcia-Swartz D., Hahn R., Layne-Farrar A., 2006b, *The move toward a cashless society: calculating the costs and benefits*, "Review of Network Economics", Vol. 5(2), pp. 199–228.
- Gerrans P., Baur D. G., Lavagna-Slater S., 2021, *Fintech and responsibility: Buy-now-pay-later arrangements*, "Australian Journal of Management", <https://doi.org/10.1177/03128962211032448>.
- Harasim J., 2021, *FinTechs, BigTechs and Banks – When Cooperation and When Competition?*, "Journal of Risk and Financial Management", Vol. 14, pp. 1–16.
- Heffernan S., 2005, *Modern Banking*, John Wiley & Sons Ltd, London.
- Hoening T.M., 2007, *Central bank perspectives on non-banks in the payments systems*, Conference on Non-banks in the Payments System: Innovation, Competition and Risk, Santa Fe.

- IMF, 2019, *Fintech: the experience so far*, International Monetary Fund, “Policy Paper”, June.
- Iwańczuk-Kaliska A., 2018, *Pieniądz cyfrowy banków centralnych – wnioski z analizy wybranych koncepcji*, „Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu”, No. 531, pp. 180–189.
- Jagtiani J., John K., 2018, *Fintech: the impact on consumers and regulatory responses*, “Journal of Economics and Business”, Vol. 100, pp. 1–6.
- Kahn C., Roberds W., 2009, *Why pay? An introduction to payment economics*, “Journal of Financial Intermediation”, Vol. 18(1), pp. 1–23.
- Kahn C., Quinn S., Roberds W., 2014, *Central banks and payment systems: the evolving trade-off between cost and risk*, Norges Bank Conference on the Uses of Central Banks: Lessons from History.
- Kucinskas S., 2015, *Liquidity creation without banks*, De Nederlandsche Bank, “Working Paper”, Vol. 482.
- Kumhof M., Noone C., 2018, *Central bank digital currencies - design principles and balance sheet implications*, Bank of England, “Staff Working Paper”, Vol. 725.
- Leinonen H., 2008, *Payment habits and trends in the changing e-landscape 2010+*, Bank of Finland, Helsinki.
- Lowe P., 2007, *Non-banks in the payments system: a central bank perspective*, Conference on “Non-banks in the Payments System: Innovation, Competition and Risk”, Santa Fe.
- Marszałek P., 2014, *Systemy pieniężne wolnej bankowości – koncepcje, cechy, zastosowanie*, Wydawnictwo Uniwersytetu Ekonomicznego, Poznań.
- Millard S., Saporta V., 2007, *Central banks and payment systems: Past, present and future*, The Future of Payment Systems, Routledge.
- Mooslechner P., Stix H., Wagner K., 2006, *How are payments made in Austria? Monetary Policy and the Economy*, Oesterreichische Nationalbank, issue 2.
- Nonbanks in the payments system: European and U.S. perspectives*, 2007, European Central Bank Division, Federal Reserve Bank of Kansas City, Working Papers, vol. 1.
- Polasik, M., Huterska, A., Iftikhar, R., & Mikula, Š., 2020, *The impact of Payment Services Directive 2 on the PayTech sector development in Europe*, “Journal of Economic Behavior and Organization”, Vol. 178, pp. 385–401.
- Polasik M., Piotrowski D., 2016, *Payment innovations in Poland: the role of payment services in the strategies of commercial banks*, “Economics and Law”, Vol. 15(1), pp. 73–101.
- Raskin M., Yermack D., 2016, *Digital currencies, decentralized ledgers and the future of central banking*, “NBER Working Papers”, Vol. 22238.
- Sullivan R.J., Wang Z., 2007, *Non-banks in the payments system: innovation, competition, and risk – a conference summary*, Federal Reserve Bank of Kansas City, “Economic Review”, Third Quarter.
- Sveriges Riksbank, 2018, *The Riksbank’s e-krona project: Report 2*, October.
- Szpringer W., Szpringer M., 2015, *Innowacje w płatnościach elektronicznych – tendencje rozwojowe*, „Problemy Zarządzania”, Vol. 13, No. 3(54), pp. 11–28.
- Thakor A., 2020, *Fintech and banking: what do we know?* “Journal of Financial Intermediation”, Vol. 43.

- Unger R., 2016, *Traditional banks, shadow banks and the US credit boom – credit origination versus financing*, “Deutsche Bundesbank”, Discussion Paper, No. 11.
- Vives X., 2019, *Competition and stability in modern banking: a post-crisis perspective*, “International Journal of Industrial Organisation”, Vol. 64, pp. 55–69.
- Worthington S., Welch P., 2011, *Banking without the banks*, “International Journal of Bank Marketing”, Vol. 29(2), pp. 190–201.
- Zamora-Pérez A., 2021, *The paradox of banknotes: understanding the demand for cash beyond transactional use*, European Central Bank, “Economic Bulletin”, issue 2.