

Financial Exclusion in the Digital Payment Space*

Márta Somogyvári

The digitalisation of payment systems is accelerating and appears unstoppable. Today, we use mixed payment systems based on cash and digital money, but an increasing number of central banks are exploring the possibility of introducing central bank digital currency and full digitalisation. The greatest obstacle to this is not only the increase in the amount of cash in circulation, but also the situation of those social groups that do not use electronic payment methods and are excluded from financial services. There are several reasons for the latter, including economic and intellectual access difficulties, low levels of digital and financial literacy, banks' business policies and difficulties in accessing digital infrastructure. Subsidising digital access and various educational training programmes can help reduce financial exclusion, but the most impactful solution may be developments that use artificial intelligence to replace face-to-face contact. This requires rapid, safe, transparent innovations that take into account the specific characteristics of the heterogeneous groups affected by financial exclusion.

Journal of Economic Literature (JEL) codes: E42, D14, G20, G53

Keywords: financial exclusion, electronic payment systems, financial literacy, digital finance, cash usage, payment infrastructure, bank of the future

1. Introduction

In the 21st century, we manage the economy and our daily lives from the digital space, and our information about the world is also captured there. Digitalisation also seems unstoppable in the financial world. Payment transactions, which today are still mixed, cash or non-cash, are a vitally important segment of finance for everyday life. Digital payment methods not only offer new, often faster and more convenient solutions for the user, as banks and financial institutions also constantly face new technological challenges. During the Covid-19 pandemic, fears of potential pathogens on paper money and coins significantly enhanced the reputation of card payment.

* The papers in this issue contain the views of the authors which are not necessarily the same as the official views of the Magyar Nemzeti Bank.

Márta Somogyvári is an Associate Professor at the Institute of Quantitative Management, Faculty of Business and Economics, University of Pécs. Email: somogyvari.marta@tkk.pte.hu

The Hungarian manuscript was received on 10 March 2021.

DOI: <http://doi.org/10.33893/FER.20.4.6585>

This process was facilitated by raising the threshold for contactless transactions to HUF 15,000. At larger retail outlets, in addition to contactless payment methods, young people are also the main users of mobile apps. If we only look at the new digital solutions announced daily in the specialised press, the introduction of instant payments, the cryptocurrency exchange rates making headlines in the news and the ideas floated by central banks about the full digitalisation of national currencies, i.e. ‘fiat money’, we might tend to believe that we will soon be saying goodbye to paper money.

The data, however, tell a different story. Almost everyone pays with cash: in 2015, the share of cash users was nearly 99 per cent (*Ilyés – Varga 2015*), and in 2019, the share of cash transactions in retail was still 80 per cent (*MNB 2020*). Between 2012 and 2019, Hungary’s cash stock grew by almost 14 per cent annually to HUF 6,500 billion (*Végső 2020*), with the coronavirus pandemic pushing this figure to HUF 7,291 billion by December 2020.¹ These data show that cash will be with us for a long time to come, and even if the number of payments through digital channels increases, cash as a form of savings (*Végső et al. 2018*) is unlikely to lose popularity in the future. Nevertheless, digitalisation is inexorably progressing. The idea that electronic payment systems facilitate the development of the economy and generate significant cost savings for society seems beyond question (*Turján et al. 2011*). However, for those excluded from the digital financial world, these savings do not materialise at all. With the advance of digitalisation, these groups are being excluded from the range of potential buyers of financial products, and they are also unable to access commercial transactions, which are increasingly moving to the electronic space.

In this paper, I take a closer look at the general arguments in favour of the full digitalisation of payment systems and contrast them with the benefits that cash offers. I summarise the academic literature on financial exclusion and describe the factors that make it impossible for some vulnerable social groups to connect to the digitalised financial space and within this space to digital payment methods. The paper draws attention to the ethical problems arising from the complete phasing out of cash use and presents some innovative directions to reduce financial exclusion.

¹ Press release on the preliminary statistical balance sheet of the MNB. <https://www.mnb.hu/letoltes/mnbmerleg-en-202101.pdf>. Downloaded: 19 February 2021.

2. Towards cashless payment systems

In terms of the digitalisation of payment systems, countries are at different stages, characterised by the variety of digital solutions and the share of payments made through digital channels. The constant stream of new FinTech solutions to replace cash, and more recently card payments as well, not only includes electronic cards and electronic wallets capable of handling physical cards issued by multiple card issuers, it has also been accompanied by a remarkable increase in the number of service providers. The banking and financial sectors now have competitors operating in the international digital space that have easy access to risk capital, can respond flexibly to consumer demands and are subject to neither the Basel III capital adequacy requirements, which have been increasingly stringent since 2008 in terms of quantity and quality (Kerényi *et al.* 2017), nor to the strict financial regulations and in many cases to the deposit protection measures of individual countries. This also means that users have almost no protection in the event of a hacker attack or the bankruptcy of their service provider. When someone wants to use Revolut to make a stock exchange transaction, and their balance suddenly is just gone, or Wirecard, a blue-chip company listed on the German stock exchange, is found to have falsified its balance sheet to cover up its capital shortfall, the trust of users in the FinTech sector can be fundamentally shaken (Zeranski – Sancak 2020). This is why BigTech companies, which – due to their huge market weight and their booming user base in the wake of the Covid-19 pandemic – are more trusted by users, are playing an increasingly important role in competition worldwide and may be threatening competitors for FinTech companies (which they usually acquire), as well as for the traditional financial sector. Facebook’s Libra project has shown how individual countries’ national sovereignty in respect of money creation could be threatened by the introduction of an international payment ecosystem controlled by BigTech companies. The Libra project aimed to develop a decentralised, anonymous, universal digital payment system backed by a currency basket of stable currencies and low-volatility instruments, but with characteristics more similar to cash (Brühl 2020). While Facebook has consistently stated that it wants to launch the project in compliance with financial rules, it is clear that the digital payment system they have in mind cannot solve the problems relating to customer identification and the prevention of money laundering. The intention to introduce Libra has drawn the attention of central banks and financial regulators to the dangers of BigTech efforts, and this has accelerated the discourse on the introduction of central bank digital currency (Didenko *et al.* 2020). The project seems to have failed due to the numerous criticisms by the world’s major central banks, but the company has not given up, as it is working on the launch of Diem, which – in contrast to Libra – is a new currency pegged to the US dollar rather than to a currency basket.

Looking at today's payment systems and the possible directions of development, we can distinguish three paradigms that will remain relevant for cash-only and digital-only payment systems in the future:

- a mixed payment system, based on cash and digital payment methods, which is common today;
- a reduced cash payment system based mainly on digital payment, but still using smaller denominations; and
- a fully cashless payment system based on central bank digital currency (and possibly cryptocurrencies).

The arguments in favour of phasing out cash can be grouped into three categories: the convenience provided by digital payment methods; the use of cash for various criminal activities; and the social and private costs of maintaining cash payment systems.

The first argument seems natural to people who are comfortable in the digital space, do not carry cash and do not queue up in the bank, use a single bank card to pay for purchases in the shop or online, make bank transfers from home and receive instant notification of transactions in their bank account.

At the same time, cash payments are seen by many as a hotbed of the shadow economy, financial crime and tax evasion (*Rogoff 2016*). Clearly, cash can be used for financing various illegal activities such as drug trafficking, smuggling, terrorism and money laundering. However, cash supply reduction and cash flow restriction are not meaningful ways to reduce crime and money laundering in today's mixed payment system. In fact, these activities are gradually shifting to digital channels, using the opportunities offered by cryptocurrencies and the darknet. Analysing the relationship between cash and the shadow economy, *Cleland (2017:82)* finds that in Great Britain, unpaid tax has not increased over the last ten years despite demand for cash growing by 75 per cent, and concludes that – contrary to popular belief – phasing out cash cannot significantly reduce or by any chance eliminate tax evasion. The Deutsche Bundesbank (DB) takes a somewhat more nuanced approach, pointing out that there is as of yet no empirical evidence to confirm the positive impact of cash phase-out on taxes paid. By contrast, there are factors that clearly influence willingness to pay tax, such as the proportion of self-employed people, the tax rate and the extent of social contribution obligations (*DB 2019a:49*).

The production, transport and storage of cash, and the replacement of worn-out paper money and coins involve complex logistical processes and are also resource-intensive and expensive. *Turján et al. (2011)* assume total savings of HUF 103 billion

if the following conditions are met: the number of POS card transactions reaches 1 billion per year, paper-based bank transfers are fully electronised, pensions are transferred to bank accounts, and postal payments with yellow cheques are completely replaced by transfers or direct debits. Unfortunately, there have been no studies on whether these savings have materialised with the spread of digitalisation. However, this amount seems low in relation to GDP, and when we look at the overall picture, it is questionable whether the savings are real. We do not know which actors will be more burdened by phasing out cash or the forced introduction of digitalisation, and what costs or difficulties, unrelated to banking and financial processes, it will create for financially vulnerable social groups. These groups include not only households with no access to the digital space, but also primarily the micro-level enterprises that are connected to these groups. Digitalisation places a particularly heavy burden on trade businesses, as they bear more than half of the costs related to digital payment methods, e.g. in the form of fees payable to card companies and banks, and terminal maintenance costs (*Schmiedel et al. 2013; Business Insider 2019*). Although the costs of card transactions have fallen considerably in recent times, they are still around 34 per cent more expensive for merchants than cash transactions, according to German data (*DB 2019b*). While these systems are easy to manage for large commercial chains, they significantly reduce the liquidity and indeed the chances of survival of small, undercapitalised enterprises or even necessity entrepreneurship.

The arguments against phasing out cash can be divided into two major groups. These relate (1) to the stability of the financial system as a whole, and (2) to the public's attachment to cash. The stability of the financial system can be strengthened by the presence of cash, because it can maintain the flow of payments even when there is some interference in the digital channels. This could be due to a software or hardware failure in the system, or an external cyber attack. A collapse of the electricity system, even a momentary blackout or a power outage lasting up to days can cause significant problems. In such cases, cash can function as a safety reserve for the public. The reserve role of cash may be the reason why even in countries with an advanced digital financial culture the amount of cash held by the public is high (*Végső 2020*). For broad strata of the public, paying with cash is a payment method that is easy, free and provides instant use without any fees or costs. The anonymity of cash and the protection of personal data are also important aspects (*Greenham – Travers-Smith 2011*). In contrast to digital payment channels, the psychological function of cash is significant, as attachment to cash is often motivated by emotional reasons. It is what people are used to and it is physically tangible, and this physical connection and the act of paying with cash are more personal than digital transactions. The data also show that despite digital alternatives, the popularity of cash is still unbroken around the world today (*Cleland 2017*).

Even if today it seems that cash will be with us for a long time, access to digital payment instruments is becoming increasingly important. Hungary is leading the way in the transition to a cashless or, initially, only reduced cash payment system. This is evidenced by the move towards the digitalisation of retail payments, mandatory card acceptance with online cash registers, restrictions on cash payments in the business sphere and the successful introduction of instant payments. The digitalisation of the financial world and payment systems also means that a key element of economic transactions will become virtual, and those who are not comfortable in the virtual world will be excluded from its opportunities. The impact of financial exclusion on these social groups is associated with externalities that are almost impossible or difficult to quantify, and which we do not usually take into account when assessing the social impact of digital payment methods.

3. Financial exclusion in the digital world

At the end of the 2010s, a total lack of access to financial services affected more than 1.7 billion people worldwide (*Demirgüç-Kunt et al. 2018*). They are the ones who are unbanked, who do not get credit and do not have access to various investment, insurance savings products and services. In the case of mixed payment systems, lack of access does not apparently mean total exclusion, as everyone or almost everyone has access to cash. However, for cash-dependent people the growing prevalence of electronic payment systems means difficulties or only limited opportunities in terms of being involved in economic life. This of course equally applies to households, as only less than half of households worldwide have access to basic financial services. People with no direct access to services and products to be paid for electronically, and relying solely on cash payment methods, can buy products and services at a higher price – if they are available for them at all – and this is also reflected in their lower standard of living and material well-being. Webshops usually have lower profit margins than shops, and if an order exceeds a certain amount, home delivery is free of charge. People without a bank card are either unable to order anything online at all or are forced to rely on intermediaries, who will shop for them for an extra charge. The other option is to buy goods from different commercial outlets that sell the same products at a higher price. If these people live in rural areas difficult to reach by public transport, they have to travel to the city to buy certain products, and this usually requires the help of an acquaintance with a car, who is also informally involved in passenger or goods transport. The price level of retail outlets or even mobile shops in villages is much higher than that of urban shops, while a very large number of their consumers have low incomes. Financial exclusion thus often goes hand in hand with social exclusion (*Kempson et al. 2000*).

3.1. Use of payment methods from cash to digital solutions

Of the wide portfolio of financial services, access to payment systems is the most widespread because, unlike credit or banking services, cash is available to everyone. However, there are groups among the adult public that may seem marginal, but comprise hundreds of thousands of people, who have lost their financial self-determination. This includes, for example, middle-aged and elderly people who are no longer able to handle even cash due to cognitive impairment. Although many of them now actually have a bank account, it is their environment, typically their family, that manages their finances for them. For the longer term, however, it is widely assumed that by the time the middle-aged generations currently using digital financial system reach old age, this could also mean a full integration of older people into the circle of users of digital financial services (*Ilyés – Varga 2015; Horn – Kiss 2019*). This expected full catching-up may be made more challenging by some observations on the health status of older age groups. Perhaps the key one is that among elderly people, dementia is the most common disease associated with cognitive decline, which on the one side was the seventh most frequent cause of death worldwide in 2019 (*WHO 2020*), and on the other hand is the third leading cause of death in high-income countries, and the proportion of people with dementia in the population is projected to rise steadily.²

People who have control over their finances use digital services to different extents. Many cash-only users are voluntarily abandoning digital payment methods. In this case, they have the means to obtain access, but think they do not need it and are attached to cash for cultural or emotional reasons (*Claessens 2006*).

The range of users of electronic payment methods varies from occasional users to fully digitalised electronic-money-only users. Occasional users are those who do not have a bank account. They usually use a prepaid card of some kind that can be used freely for purchases, but this also includes the prepaid meter card for electricity services, mobile balance top-up, and in Hungary, use of the prepaid SZÉP Recreation Card (although in this case there is a technical account behind the card).

The next group consists of people who need a face-to-face contact regarding information about their bank account and possible problems. Many of them are forced users, for example because as public service employees they are obliged to receive their salary on a bank account or have their pension transferred to a bank account, but they do not use any other service. Once a month, they withdraw the money in cash from a bank branch or an ATM machine. They make transfers on paper, at the bank, with the help of bank staff to complete them, and although many

² *Alzheimer's and other dementias* – Statistics & Facts. <https://www.statista.com/topics/3722/alzheimer-s-disease-and-other-dementias/>. Downloaded: 14 January 2021.

of them pay for public services by direct debit, they ask at the bank for information on the state of their bank account. They also need face-to-face contact with a bank representative because they would not be able to do things on their own, they do not have sufficient information about banking processes and do not know what account they should hold and when. This is partly due to the fact that information on banking products, account types and condition lists is relatively difficult to access. These official documents can only be downloaded from banks' websites after a long search, and the more readily accessible parts of the websites contain marketing material for the target group. The documents are also posted in bank branches, but the formal language of bank information is hard to understand, the wording is too technical, and the particulars are rather difficult for an outsider to interpret. It is not by chance that the EU Directive 2014/92/EU requires banks to provide clear and transparent information on bank accounts (*EU 2014*).

The biggest leap in terms of entering the digital financial world is online banking. Although the boundaries between cash users and electronic money users are not always distinguishable, as almost everyone uses cash today, the line between those who need face-to-face banking and do not participate in digital banking and those who use net banking is relatively sharp. The proportion of people using net banking in Hungary is just below the EU average: in 2020, 57 per cent of the public in the EU and 51 per cent in Hungary used online banking. However, this proportion is very low compared to the Nordic countries with the strongest coverage, such as Finland or Norway, where the proportion of net bank users is over 90 per cent (*EC 2020*).

The positive experience of online banking, and the related card and now phone app payments, coupled with the convenience and the demand for non-stop access to the system, may also lay the basis for the use of FinTech payment methods. These are very diverse today. They include, among others, cardless payment solutions over the internet; payment gateways that function as online POS terminals and connect e-commerce participants and banks; mobile P2P (peer to peer) payment solutions; mobile wallets that connect to technical accounts behind physical bank cards; global digital remittance providers connecting guest workers abroad and family members back home; mobile phone payment systems (*Business Insider 2019*).

3.2. Distinguishing between access and use

Access to digital payment systems means in fact the availability of the relevant services and products from the supply side. If the supply side finds the right target groups, the users will be reached as a common intersection of supply and demand. Non-users can be divided into two groups: there are those who voluntarily exclude

themselves from using digital payment systems and those who are excluded from it for some external or internal reason (Claessens 2006).

Why do some potential users voluntarily exclude themselves from using digital payment systems, when neither the infrastructure available to them nor their digital literacy are barriers? One practical reason is that if they receive their salary or income in cash, it is not worth paying it into their bank account every month. Another common reason for the refusal of use is the virtuality of electronic money. People who use a bank card or transfer money from a bank account are often unclear about what their money is spent on and how much, and they do not even know the actual amount in their account. This in turn can lead to them being unable to manage their income properly. International surveys also show that it is much easier for people to allocate their money if it exists in a tangible, physical form. Around 31 per cent of unbanked people in a Great Britain study said they did not have banking connections for this reason (Lloyds Bank 2017).

3.3. Reasons for involuntary exclusion

In order to assess what products and services are needed to increase the penetration of digitalisation, it is necessary to identify the reasons why a relatively high proportion of the population is still attached to cash (Demirgüç-Kunt *et al.* 2008). The forced exclusion of many from the digital payment system has subjective and objective elements that often reinforce each other. These barriers can be divided into two broad categories. The first category includes barriers to access to digital payment services, whereas the second one relates to exclusionary factors and regulatory issues associated with banking supply.

3.3.1. Availability of digital financial payment infrastructure

Access to financial infrastructure can be provided in person or digitally. Although there are now examples in Hungary of the possibility to open a bank account or handle account-related matters online using video identification, these are only pioneering ways that require relatively good digital literacy and continuous high-speed internet access. The general way to open an account is to go to a bank branch in person, and cash withdrawals can also only be made at a bank or an ATM, or possibly at a post office branch. It is not by chance that, in their listing socio-demographic determinants, Ilyés and Varga (2015) highlight that the size of a settlement has a fundamental impact on bank account coverage and that small settlements have a negative bearing on the use of banking services. The type of settlement thus clearly determines the physical accessibility of banking services (Horn – Kiss 2019). The Hungarian bank branch network has shrunk significantly in recent years. While in 2008, there were more than 4,400 bank branches in the country (Helmeczi 2010), at the beginning of 2021, the branch and ATM locator of

the Magyar Nemzeti Bank (the Central Bank of Hungary, MNB) showed only 1,844 branches. 78 per cent of Hungarian settlements do not have a branch; the density of bank branches is only adequate in Central Hungary and in the Southern Great Plain, i.e. these are the only areas where financial institutions are available in almost all settlements (*El-Meouch et al. 2020*). In other regions, where the poor population living in very small villages is particularly vulnerable financially, not only the lack of bank branches, but also the lack of public transport is a major handicap to accessing financial infrastructure (*El-Meouch et al. 2020*).

According to 2019 data from World Bank, Hungary is on a par with Slovakia in terms of ATM availability per capita, but it lags well behind Croatia and even Romania.³ The previously dynamic growth in ATM deployment in the world slowed down markedly from 2011 onwards and seems to have come to a standstill in 2017 (*World Bank 2021*). In February 2021, there were 4,685 ATMs in Hungary. Cash withdrawals can also be made at a post office and there were 2,554 post office branches in 2021. The limited opening hours of smaller rural branches make it difficult for those who work to use the also limited banking services available at a post office. Wide access to digital payment systems is not ensured in rural areas, but money withdrawal itself is possible in some form in larger settlements.

The decline in the number of bank branches is not only related to bank consolidation in Hungary. This is a self-generating process that is also facilitated by the spread of digital financial solutions. If customers use net banking to conduct their transactions and payments shift towards electronic means, the need for face-to-face contact is reduced, leading to lower bank branch utilisation. Competition generated by FinTech companies providing financial services also has a negative impact on banks' profitability (*Scardovi 2017*). This is compounded by increasingly stringent standards for traditional banks. In fact, the regulation of new FinTech companies, which often provide international services, is currently rather lax. Banks are responding to the intensifying competition by cutting costs, with a consequent increase in branch closures. Access to banking services for the rural population is a long-standing problem around the world.

Having the right digital devices and an internet connection are essential for digital access. In 2018, in Hungary, 48 per cent of households had a laptop, 42 per cent had a desktop computer, 15 per cent had a tablet, and almost all households had one or more mobile phones (*HCSO 2018*). No data are available on how many households do not have internet-enabled ICT devices, but when the Covid-19 pandemic caused schools to switch to digital learning, the lack of internet connection, digital devices and electricity was the biggest problem in many small rural settlements. A survey

³ There are around 61 ATMs per 100,000 inhabitants (*World Bank 2021*).

in villages with foundation schools found that more than one third of pupils were not able to engage in digital learning activities.⁴ In terms of internet coverage, the country is in a relatively good position, with cable broadband network covering 94 per cent of households, high-speed broadband coverage at 90 per cent and 4G coverage at 97 per cent. If we look at usage, the picture is much worse. In 2019, regular net surfers make up 80 per cent of the public, and 66 per cent of internet users use the net bank, which is a very large increase when compared to the 49 per cent in 2017. By contrast, 9 per cent of the public do not use the internet at all. Mobile broadband usage is the lowest in the EU: in Hungary, only 70 out of every 100 subscribers use the mobile internet. Based on the European Commission's DESI Composite Index, which covers technological progress (broadband internet deployment and use, the penetration and pricing of broadband mobile internet), the level of education in the society, internet usage penetration and e-government, Hungary ranks 21st out of the 28 EU countries (*EC 2020*). While the infrastructural conditions essential for the use of digital financial solutions are usually available for all but the poorest rural, segregated households, their use does not reflect the scale of the opportunities.

3.3.2. Economic access

There is no benefit in having proper network infrastructural conditions if deprived households cannot afford the costs involved. Globally, low household income is one of the most explicit indicators of who uses only cash (*Greenham – Travers-Smith 2011*), but the same correlation can also be detected with GDP (*Bech et al. 2018*). Hungarian research confirms this (*Horn – Kiss 2019*). If we try to put together the cost factors affecting access to digital infrastructure, we find that it is the price of electricity and the price of cable and mobile internet that can be a barrier to connecting to any infrastructure that may be available. In Hungary, there are about 1 million people living in poor families in the first income decile, with very low incomes of around HUF 500,000 a year, and another 1 million people in the second decile also have incomes of less than HUF 1 million a year.⁵ While the availability of electricity may seem like a given in Hungary, there are a very high number of consumers in need of protection due to their social situation who have accumulated relatively high arrears. In 2017, the number of disconnected consumer premises was almost 100,000,⁶ and in 2019, the number of consumers with debts more than

⁴ Amit a digitális tanrend felszínre hoz: sok helyen nem hogy digitális tudás, de megfelelő tér, vagy áram sincs – tanodák, roma közösségi szervezetek és szülők tapasztalatai (*What the digital curriculum reveals is that in many places there is not only no digital knowledge, but there is also no adequate space or even electricity – the experience of foundation schools, Roma community organisations and parents*). https://www.rosaparks.hu/wp-content/uploads/2020/06/K%C3%B6z%C3%B6ss%C3%A9gi_kutat%C3%A1sR%C3%B6v.pdf. Downloaded: 14 January 2021.

⁵ Gross and net per capita income by income decile. Hungarian Central Statistical Office. https://www.ksh.hu/docs/hun/xstadat/xstadat_eves/i_zhc047.html. Downloaded: 14 January 2021.

⁶ Eladósodottság és hátralékosság. Éves jelentés a lakhatási szegénységről 2018 (*Indebtedness and arrears. Annual report on housing poverty 2018*). <https://www.habitat.hu/mivel-foglalkozunk/lakhatasi-jelentesek/lakhatasi-jelentes-2018/eladosodottsag-es-hatralekosság/#6>

a year overdue was just over 300,000.⁷ For these people, both cable and mobile internet are unaffordable. The cheapest internet tariffs are around HUF 4,000–5,000 a month, i.e. for the poorest people, using cable internet would cost almost 10 per cent of their annual income. With regard to mobile internet, even for those with better incomes, not everyone uses it, as tariffs for mobile phone use are among the highest in the EU (*EC 2020*). For the most vulnerable and poorest people, connecting to digital infrastructure is impossible under the current income conditions. For them, cash is the only universal means of payment that they have access to at no extra cost and can use instantly wherever they are (*Végső et al. 2018*).

3.3.3. Intellectual access

To use ICT devices properly and learn how to use electronic money, we need two things: digital skills and financial literacy. Even at the basic skills level, the digital skills of the Hungarian public are below the EU average, standing at 49 per cent compared to the 58 per cent in the EU, and this has unfortunately not shown signs of improvement in recent years (*EC 2020*). The proportion of people using digital payment devices increases with education, but those with only an 8th grade education and even those who attended vocational school lag significantly behind; even if they have a bank account, they do not use a bank card (*Ilyés – Varga 2015*). This may not only be because those less educated people who can afford access to financial infrastructure do not know how to handle a computer or a smartphone: in many cases they receive all or part of their salary in cash, live in rural areas, often support themselves through casual work and thus they do not feel like they need electronic payment devices. Lack of digital literacy is clearly evident in the case of older generations, with older age clearly increasing the use of cash as compared to electronic solutions (*Ilyés – Varga 2015; Greenham – Travers-Smith 2011*).

Another important factor for intellectual access is financial literacy (*Kovács – Terták 2019*). Various surveys around the world show that the level of financial literacy is low not only in low-income countries but in middle- and high-income countries as well. This includes knowledge of finance and individual institutions, financial skills such as compound interest calculation as well as financial planning, and managing and investing money. When looking at the demographic factors, we find that typically women, the elderly and minorities living in segregation have low level of financial literacy, while higher income and higher education increase the level of financial literacy (*Xu – Zia 2012*).

⁷ Number of customers in arrears by energy carrier and duration of payment delay (pc). <https://habitat.hu/sites/lakhatasi-jelentes-2020/adattar/>. Downloaded: 14 January 2021.

3.3.4. Exclusionary factors associated with banking supply and financial regulation

Unsettled status, bad banking history and judicial enforcement also often prevent the opening and/or use of a bank account. In Hungary, in principle, there is no need to have a residence card to open a bank account, but banks usually require Hungarian citizens to have one. Those who are in debt and whose debts are deducted from their salary or other income coming into their account also prefer to use only cash rather than a bank account.

Many people are excluded from financial services because of banking processes and banks' business policies (*Kempson et al. 2000; Gosztonyi – Havran 2021; Kirwan 2021*). In general banking practice, this also includes when the customer is found to be too risky. This practice was addressed by the EU's Bank Accounts Directive, requiring banks in the Member States to provide all European citizens with a payment account with basic features (*EU 2014*). Some banks target a certain type of business, and so other potential, but undesirable customers are discouraged by the terms and conditions governing the use of the products. Such a requirement is, for example, the receipt of a certain amount of income or a certain number of transfers from the account. In these cases, banks resort to targeted marketing in an attempt to reach only those they would like to see among their customers. Also pricing, account management fees as well as cash withdrawal fees and the fee for net banking is included here – this is another way of ensuring that only those customers are able to use a given service who can pay for it, or who generate more traffic, thus contributing to the bank's profit. The final business policy-related factor mentioned by *Kempson et al. (2000)* is voluntary exclusion, which is encouraged by fear of banking procedures. Many people do not use banking services, thinking they will be refused anyway because of their social status or level of income.

4. Possible ways to eliminate financial exclusion

A wide range of social actors can do something about avoiding exclusion from the digital financial system. They include the state as a regulatory authority, the education system, banks, FinTech companies, among them ICT innovation start-ups, BigTech companies, retailers, and on the demand side, users themselves.

In Hungary, from 1 January 2021 onwards, all retail outlets with an online cash register are obligated to accept electronic payments. For this to reduce cash use in a meaningful way, demand for electronic payment should also be created on the user side. How is this possible in relation to social strata suffering from financial exclusion? The target systems of EU standards mainly address the infrastructural prerequisites and the promotion of digital literacy for society as a whole, but do not focus explicitly on the involuntary financial exclusion of groups in special situations.

The Hungarian National Digitalisation Strategy also mentions the problem and particularly highlights the group of people living in extreme poverty, the Roma and elderly people living alone in rural areas, whose digital literacy is to be improved through ‘targeted awareness and communication programmes’ (NDS 2019:115). Clearly, it is not primarily the lack of possibility to access the digital infrastructure that is hindering access to the financial digital infrastructure in Hungary. Besides the intellectual barriers, a much bigger barrier is the lack of economic access. If we were to recognise also here in Hungary that access to digital systems, i.e. to the internet, is a basic right that the state should provide as a public good, we could largely eliminate the disadvantages arising from the difficulties of economic access, and this would also make digital access easier for those in the lower income deciles. Supporting fixed costs associated with the use of digital infrastructures and thus facilitating access to the financial system is an important argument in the fight against poverty, the effectiveness and legitimacy of which is the subject of heated debates in the academic literature, and this is particularly true for the beginning of the century (Demirgüç-Kunt *et al* 2008; Bech *et al.* 2015). Of the declarations on this issue, the Estonian example has perhaps the greatest relevance: Estonia defines access to cyberspace as a human right and provides it for citizens virtually free of charge. This also allows for exclusive digital communication between citizens and state bodies.⁸

In addition to providing access to the internet, digital devices should also be provided free of charge or for a nominal fee for households in the low income deciles. This would also facilitate access to online education for the needy strata, especially children and young people, and would be a logical next step after free printed textbooks, which could even be replaced in this way. Such a move, and of course the associated educational programmes tailored to the specific characteristics of the target groups, could also bridge the gap caused by the lack of bank branches or their inaccessibility due to poor transport in underdeveloped regions with very small villages. Thus, digital access could be the basis for access to the financial system, and electronic payment systems and other financial services would also become available.

Regardless of the manner in which infrastructural and economic access to digital payment systems is ensured, the measures can only be successful if they are accompanied by the removal of barriers to intellectual access. Financial knowledge

⁸ Estonia is a digital society. <https://www.visitestonia.com/en/why-estonia/estonia-is-a-digital-society>

education has already started in both secondary and primary schools, which is a positive sign for the future.⁹ The Pénz7 (Money Week) programme is also included in the document entitled ‘Strategy to improve public financial literacy’ adopted by the Hungarian Government in 2017.¹⁰ However, the extent to which these programmes will reach schools in the poorest, most segregated settlements remains to be seen. The target group of this high-quality, imaginative textbook for 7th and 8th grade pupils is children from average or well-off families (*Burkáné et al. 2017*). Pupils living in extreme poverty, who often struggle with reading and reading comprehension problems and have poor mathematical or algebraic knowledge, should be provided with educational materials that reflect their living conditions and teach them to develop appropriate skills in numeracy and ICT user literacy.

How can barriers to intellectual access be broken down for those who have been excluded from the digital space, or who simply cannot or perhaps dare not use internet banking interfaces? Most Hungarian net banks do not seem to be user-friendly even for users familiar with the digital world. A 2015 survey found that the net banks tested scored only 50–70 per cent in terms of user interface and user experience.¹¹ For groups affected by financial exclusion, there is a need for systems that are easy to use, take into account the logic and, where appropriate, the limited digital skills of users and are customer-friendly, simple, comprehensible, easy to navigate, not based on impossible-to-remember and illogically designed pictogrammes, and that contain only the functions that the user needs.

These new systems, new services and the consideration of the special needs of users suffering exclusion can hardly be expected from traditional banks. The population of ‘non-users’ is too diverse, as it includes the elderly, perhaps cognitively impaired, poor, segregated social groups or minorities as well as those self-employed necessity entrepreneurs who are entirely dependent on their accountants to manage their official affairs and even transfers. Financial institutions are not aware of the specificities of these groups or do not want to deal with them, because it is too costly, and, indeed, their banking business strategy often precludes this. Another example of this trend can be seen in the way the poorer strata of the public are being provided with credit, where lending is taken over from banks by local traders, local loan sharks or specialised financial companies that work with a large network of local agents, have face-to-face contact with the borrowers and charge very high APRs.

⁹ *Indul a PÉNZ7 pénzügyi és vállalkozói témahét (PÉNZ7 – Financial and Entrepreneurial Thematic Week is kicking off)*. <https://penziranytu.hu/indul-penz7-penzugyi-es-vallalkozoi-temahet>. Downloaded: 14 January 2021.

¹⁰ *Pénzügyi tudatosság fejlesztésének stratégiája (Strategy to improve financial literacy)*. <https://www.okosanapenzel.hu/Media/Default/ASZ-videok/P%C3%A9nz%C3%BCgyi%20tudatoss%C3%A1g%20fejleszt%C3%A9s%C3%A9nek%20strat%C3%A9gi%C3%A1ja.pdf>

¹¹ *Internetbankok használhatósági elemzése (Usability analysis of internet banks)*. <https://ergonomx.hu/modszertan.php>. Downloaded: 14 January 2021.

If banking supply is unlikely to change in the near future to reduce financial exclusion, then who are the actors that can help target the strata at the bottom of the pyramid? Is there a way to incorporate the groups that are being left out by traditional financial institutions into the digital finance user base? The closure of bank branches penalises the most disadvantaged strata of the society, and banks are not really investing in services that replace face-to-face contact-based banking offered at a branch. What is needed here are alternative solutions that not only move services related to payment transactions and lending into the digital space (Boobier 2020), but also make them accessible to all. The solution is to utilise artificial intelligence and communicate in natural language in the digital space. Enterprises operating the payment systems of the future will have to learn to communicate with the user on all digital devices – be they computers, tablets or mobile phones – ‘with the same tone of voice’, in the same way, and to design banking interfaces following the logic of the users, not that of programmers. In other words, a very efficient, transparent and radically simple service is required. In terms of reducing financial exclusion, verbal, i.e. voice-controlled interfaces are of the greatest importance. The payment service provider of the future will use chatbots to talk to the user (Bhattacharyya 2017), who will communicate verbally, in writing or even by touching the corresponding images. Artificial intelligence interprets the conversation by comparing the given situation with the customer’s previous transactions or with behavioural patterns of similar transactions stored in the cloud. Today’s common financial assistants with simple budgeting features in banking apps do not protect users from making poor financial decisions, and in fact, app users are more likely to accumulate debt.¹² Thus, new groups with no financial literacy or even those struggling with cognitive decline would benefit from the development of an AI-based solution that not only manages payment processes, but also controls and implements household budget allocations and utility bill payments according to pre-set rules, monitors daily spending, alerts on sudden deviations from previous payment patterns and, where appropriate, prevents abnormally high or unusual transactions.

We are still a long way off from the day when the digital banking assistant addresses customers in their own language both in mother tongue and in cultural terms, explaining payment transactions and financial processes in a way that everyone can understand and even protecting them from reckless spending. The companies developing this are not necessarily from the financial sphere. BigTech companies such as Google, Amazon, Apple and Facebook have extensive and daily growing experience in the areas of artificial intelligence, speech recognition and text interpretation. On their servers, in their cloud, they have an infinite amount of

¹² *Want to manage your money better? Ditch your banking apps.* www.finextra.com/newsarticle/32933/want-to-manage-your-money-better-ditch-your-banking-apps. Downloaded: 14 January 2021.

social media data that they can use to profile users in detail for any purpose. Yet, they miss non-users and digital illiterates. We do not know how much longer we will have to wait for these digital financial apps; and even if the very first English versions are already working, who knows how long it will take to translate them into Hungarian both linguistically and culturally.

Due to the shrinking availability of face-to-face banking and the increasing digitalisation, the number of financially excluded people both in Hungary and other European countries may continue to rise in the near future. These rather heterogeneous groups need specific solutions tailored to their needs and financial literacy or inexperience. The only ICT device available to almost everyone is the mobile phone. Just as in China large masses of users have switched from cash to mobile phone payment systems without using bank cards, the same could be a development direction worth considering here in Hungary with regard to excluded groups. The near future can bring a breakthrough only if new actors, new FinTech companies emerge that can act as intermediaries between those who are inexperienced in digital finance and the banks. This means taking on the communication burden with excluded groups that banks are not able to do, aggregating the demand side and, where appropriate, leaving only the processing of back-end payments to banks. Here, we are talking about innovative solutions through which they provide simple, secure, always-on payment services for people who have previously been cash-only users. In order to do this the first step is to identify the reasons preventing the relatively broad strata of the society from participating in the modern economy characterised by digital finance.

5. Summary

The digitalisation of finance is making ever greater progress, affecting the whole spectrum of financial institution services, including payment systems. Central banks' plans for the future are also looking at the introduction of central bank digital currency, which could be followed by a drastic restriction in the use of cash and, over the longer term, the complete elimination of cash. The main arguments for cash phase-out are: the anonymity of cash leaves room for money laundering and the settlement of illegal transactions, and facilitates corruption; the maintaining of cash circulation entails high costs borne by society. However, today's mixed payment system based on digital solutions and cash also shows the risks of a full digital switchover. Cash can also be seen as a safety reserve increasing the resilience of payment systems to external shocks such as a total or partial breakdown of the digital infrastructure due to hacker attacks or even a collapse of electricity supply. The use of cash gives the socially and/or financially vulnerable groups in society the opportunity to participate actively in economic and social life. The factors

underlying the partial or total exclusion of relatively large groups of society from the digital financial space and their inability or unwillingness to use cashless payment methods will persist for a long time. Physical, intellectual and economic access to the digital infrastructure is included, and this is also fundamentally influenced by the profit-driven business policies of the banks and FinTech companies providing the services. For this reason, the digital payment systems of the future and the ideas for the complete phasing out of cash should only become a real alternative with due foresight and without deepening social inequalities. In order to extend the penetration of digital financial payment methods to groups affected by financial exclusion as well, new digital innovations are needed that take into account the characteristics of these rather heterogeneous groups and are able to tailor services to them. By presenting and categorising the barriers to accessing financial payment systems, I intended to contribute to this process.

References

- Bech, M. – Faruqui, U. – Ougaard, F. – Picillo, C. (2018): *Payments are a-changin' but cash still rules*. BIS Quarterly Review, March, pp. 67–80. https://www.bis.org/publ/qrtrpdf/r_qt1803g.pdf
- Beck, T. – Senbet, L. – Simbanegavi, W. (2015). *Financial Inclusion and Innovation in Africa: An Overview*. Journal of African Economies, 24(Issue suppl_1), i3–i11. <https://doi.org/10.1093/jae/eju031>
- Bhattacharyya, S. (2017): *WTF is Conversational Banking?* DigiDay. 7 February. <https://digiday.com/media/what-is-conversational-banking/>. Downloaded: 14 January 2021.
- Boobier, T. (2020): *AI and the Future of Banking*. Wiley. <https://doi.org/10.1002/9781119596165>
- Brühl, V. (2020): *Libra – A Differentiated View on Facebook's Virtual Currency Project*. Intereconomics, 55(1): 54–61. <https://doi.org/10.1007/s10272-020-0869-1>
- Burkáné Szolnoki, Á. – Merényi, Zs. – Székely, J. (2017): *Küldetések a pénz világában (Missions in the world of money)*. <https://penziranytu.hu/sites/default/files/tananyag/tankonyv/Kuldetesek%20a%20penz%20vilagaban%20tankonyv.pdf>. Downloaded: 14 January 2021.
- Business Insider (2019): *The Payments Ecosystem: The biggest shifts and trends driving short- and long-term growth and shaping the future of the industry*. Business Insider Intelligence, November.
- Claessens, S. (2006): *Access to Financial Services: A Review of the Issues and Public Policy Objectives*. World Bank Research Observer, 21(2): 207–240. <https://doi.org/10.1093/wbro/lkl004>

- Cleland, V. (2017): *Insights into the Future of Cash*. Bank of England. <https://www.bankofengland.co.uk/-/media/boe/files/speech/2017/insights-into-the-future-of-cash.pdf>. Downloaded: 14 January 2021.
- DB (2019a): *Cash demand in the shadow economy*. Deutsche Bundesbank Monthly Report March 2019, pp. 43–58. <https://www.bundesbank.de/resource/blob/793190/466691bce4f27f76407b35f8429441ae/mL/2019-03-bargeld-data.pdf>
- DB (2019b): *The costs of payment methods in the retail sector*. Deutsche Bundesbank Monthly Report June 2019, pp. 65–79. <https://www.bundesbank.de/resource/blob/800766/0462923c3587a2d98f2c2db5b71047ae/mL/2019-06-kosten-zahlungsmittel-data.pdf>
- Demirgüç-Kunt, A. – Beck, T.H.L. – Honohan, P. (2008): *Finance for All? Policies and Pitfalls in Expanding Access*. Policy research report, World Bank.
- Demirgüç-Kunt, A. – Klapper, L. – Singer, D. – Ansar, S. – Hess, J. (2018): *The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution*. Washington, DC: World Bank.
- Didenko, A. – Zetzsche, D.A. – Arner, D.W. – Buckley, R.P. (2020): *After Libra, Digital Yuan, and COVID-19: Central Bank Digital Currencies and the New World of Money and Payment Systems*. <https://doi.org/10.2139/ssrn.3622311>
- EC (2020): *A digitális gazdaság és társadalom fejlettségét mérő mutató (DESI), 2020 – Magyarország (Digital Economy and Society Index (DESI), 2020 – Hungary)*. European Commission. https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=66944. Downloaded: 14 January 2021.
- El-Meouch, N.M. – Fellner, Z. – Marosi, A. – Szabó, B. – Urbán, Á. (2020): *An Estimation of the Magnitude and Spatial Distribution of Usury Lending*. *Financial and Economic Review*, 19(2): 107–132. <http://doi.org/10.33893/FER.19.2.107132>
- EU (2014): *Directive 2014/92/EU of the European Parliament and of the Council of 23 July 2014 on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features*. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014L0092>
- Gosztonyi, M. – Havran, D. (2021): *Highways to Hell? Paths Towards the Formal Financial Exclusion: Empirical Lessons of the Households from Northern Hungary*. In: *The European Journal of Development Research*. <https://doi.org/10.1057/s41287-021-00434-9>
- Greenham, T. – Travers-Smith, F. (2011): *Cashing Out: The hidden costs and consequences of moving to a cashless society*. RSA Action and Research Center. <https://www.thersa.org/globalassets/pdfs/reports/rsa-cashing-out.pdf>. Downloaded: 14 January 2021.

- HCSO (2018): *A háztartások életszínvonala (Living standards of households)*, 2018. Hungarian Central Statistical Office. <https://www.ksh.hu/docs/hun/xftp/idoszaki/hazteletszinv/2018/index.html>
- Helmecci, I. (2010): *A magyarországi pénzforgalom térképe (The map of payments in Hungary)*. MNB Occasional Papers No 84, Magyar Nemzeti Bank. <https://www.mnb.hu/letoltes/mt-84.pdf>. Downloaded: 14 January 2021.
- Horn, D. – Kiss, H.J. (2019): *Who Does Not Have a Bank Account in Hungary Today?* Financial and Economic Review, 18(4), 35–54. <http://doi.org/10.33893/FER.18.4.3554>
- Ilyés, T. – Varga, L. (2015): *Show me how you pay and I will tell you who you are – Socio-demographic determinants of payment habits*. Financial and Economic Review, 14(2): 25–61. <https://en-hitelintezetiszemle.mnb.hu/letoltes/2-ilyes-varga-en.pdf>
- Kempson, E. – Whyley C. – Caskey, J. – Collard. S. (2000): *In or Out? Financial Exclusion: A Literature and Research Review*. Financial Services Authority, London. <http://www.bristol.ac.uk/media-library/sites/geography/migrated/documents/pfrc0002.pdf>. Downloaded: 14 January 2021.
- Kerényi, Á. – Molnár, J. (2017): *The Impact of the Fintech Phenomenon – Radical Change Occurs in the Financial Sector?* Financial and Economic Review, 16(3): 32–50. <http://doi.org/10.25201/FER.16.3.3250>
- Kirwan, S. (2021): *Financial inclusion*. Agenda Publishing Limited.
- Kovács, L. – Terták, E. (2019): *Financial Literacy Theory and Evidence*. Verlag Dashöfer, Bratislava. <https://bankszovetseg.hu/Public/publikacio/Financial%20literacy.pdf>. Downloaded: 16 October 2021.
- Lloyds Bank (2017): *Consumer Digital Index 2017: Benchmarking the Digital and Financial Capability of Consumers in the UK*, Lloyds Bank.
- MNB (2020): *Payment Systems Report, 2020*. Magyar Nemzeti Bank. <https://www.mnb.hu/en/publications/reports/payment-systems-report/payment-systems-report-2020>
- NDS (2019): *Nemzeti Digitalizációs Stratégia 2021–2030 (National Digitisation Strategy 2021–2030)* Ministry for Innovation and Technology, Ministry of Interior. <https://2015-2019.kormany.hu/download/f/58/d1000/NDS.pdf>
- Rogoff, K.S. (2016): *The Curse of Cash*. Princeton University Press. <https://doi.org/10.1515/9781400883219>
- Scardovi, C. (2017): *Digital Transformation in Financial Services*. Springer. <https://doi.org/10.1007/978-3-319-66945-8>

- Schmiedel, H. – Kostova, G.L. – Ruttenberg, W. (2013): *The social and private costs of retail payment instruments: a European perspective*. Journal of Financial Market Infrastructures, 2(1): 37–75. <https://doi.org/10.21314/jfmi.2013.020>
- Turján, A. – Divéki, É. – Keszy-Harmath, Z. – Kóczán, G. – Takács, K. (2011): *Nothing is free: A survey of the social cost of the main payment instruments in Hungary*. Occasional Papers 93, Magyar Nemzeti Bank. <https://www.mnb.hu/letoltes/op93-fmtk.pdf>
- Végső, T. (2020): *Comparative Analysis of the Changes in Cash Demand in Hungary*. Financial and Economic Review, 19(1): 90–118. <http://doi.org/10.33893/FER.19.1.90118>
- Végső, T. – Belházyiné Illés, Á. – Bódi-Schubert, A. (2018): *Késszép vagy kártya? A magyar lakosság fizetési szokásainak feltáró elemzése (Cash or card? – An explorative analysis of consumers’ payment behaviour in Hungary)*. Pénzügyi Szemle, 63(4): 455–479.
- Xu, L. – Zia, B. (2012): *Financial Literacy around the World – An Overview of the Evidence with Practical Suggestions for the Way Forward*. Policy Research Working Paper 6107, The World Bank, June 1–56. <https://documents1.worldbank.org/curated/en/264001468340889422/pdf/WPS6107.pdf>
- WHO (2020): *The top 10 causes of death*. <https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death>
- World Bank (2021) *Automated teller machines (ATMs) (per 100,000 adults)*. <https://databank.worldbank.org/reports.aspx?source=2&series=FB.ATM.TOTL.P5>
- Zeranski, S. – Sancak, I.E. (2020): *The Wirecard Scandal: The High-speed Rise and Fall of a FinTech Company and Its Implications for Developed and Developing Economies*. Oxford Business Law Blog. <https://doi.org/10.13140/RG.2.2.19897.80482>