



PAYMENT SYSTEMS REPORT



2022

*‘Remember to set an example
in everything you do.’*

King Louis I. (‘The Great’)



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2022

Published by the Magyar Nemzeti Bank

Publisher in charge: Eszter Hergár

H-1013 Budapest, Krisztina körút 55.

www.mnb.hu

ISSN 2498-7085 (on-line)

ISSN 2064-9045 (print)

Pursuant to Act CXXXIX of 2013 on the Magyar Nemzeti Bank, the primary objective of Hungary's central bank is to achieve and maintain price stability. As set forth in the Act on the Magyar Nemzeti Bank, one of the main responsibilities of the Magyar Nemzeti Bank (MNB) is to promote the smooth execution of payments and to facilitate the reliable, efficient functioning of the financial market infrastructures that support this. All of this is indispensable for the performance of real economy and financial transactions.

The purpose of this Report is to present a comprehensive review of trends in the field of payments and the operation of the overseen financial market infrastructures, the main risks and the measures taken by the MNB to fulfil the responsibilities above. In publishing this report, the MNB wishes to contribute to enhancing the transparency of its activities in relation to financial market infrastructures and the execution of payments, while also endeavouring to enhance financial literacy and thus raise awareness about payment-related issues.

The analyses in this Report were prepared by the Directorate Financial Infrastructures of the MNB, under the general direction of Executive Director Lajos Bartha. The Report was approved for publication by the Financial Stability Board at its meeting on 24 May 2022. Contributors: Iván Ágoston, Gergely Balla, Zita Bárdits, Beáta Csapó, Péter Császár, Árpád Cseh (editor), Vivien Deák, Beáta Felföldi, Attila Hodován (editor-in-chief), Bence Illés, László Kajdi, Marianna Kárpátné Vereczki, Dr Milán Kiss, Eszter Kozma, Miklós Luspay (Head of Department), Dr Gergő Marék, István Nemecskó, Cecília Pintér, Dániel Rácz, Miklós Sallai, Ádám Szepesi, Kristóf Takács, Szilveszter Tordai, Lóránt Varga (Head of Department).

The key messages of the study as well as the Report were discussed and valuable advice on the finalisation of the document was provided at the meetings of the Financial Stability Board on 10 March 2022 and 24 May 2022, and at the Monetary Council meeting on 10 May 2022.

The MNB staff relied primarily on information relevant to 2021, although looking forward the Report also analyses ongoing developments observed in the course of 2022.

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1 Executive summary

PAYMENT SERVICE DEVELOPMENTS

In many respects, payment service developments in 2021 returned to the track observed prior to the coronavirus pandemic, bringing dynamic development in terms of the further spread of electronic payments. Although in the form of smaller or bigger waves the coronavirus pandemic continued to be a determinant of everyday life, its effects in the area of payments were already more limited than in the previous year. The development of the electronic payment infrastructure in Hungary was primarily determined by the transformation of consumer habits due to digitalisation processes as well as by the change in the legislation entering into force on 1 January 2021 and concerning those obliged to use online cash registers. Accordingly, the domestic card acceptance infrastructure expanded considerably, and more and more consumers used innovative electronic payment solutions, including primarily mobile wallet services based on payment cards. On the whole, it is seen that lack of electronic payment options does not prevent their spreading any longer. Nevertheless, further progress is expected from the spreading of end-user services relying upon instant payment, such as the QR code-based payment initiation and the request-to-pay service. Regarding the turnover, the trends observed prior to the outbreak of the coronavirus pandemic returned in spite of the fact that some of the restrictions remained in place in 2021 as well due to the recurring waves of the pandemic.

The increase in payment card purchases, which had been a driving force of electronic payments, exceeded 20 per cent again, with instant payment catching up, even surpassing the former in many respects. Although to a minimum extent, but the value of cash withdrawals was up again. At the same time, the gap between the value of payment card purchases and cash withdrawals became even wider in favour of the former. Nevertheless, major differences across payment situations were observed in 2021 as well. The most important change was the result of consumers' gradual return to physical purchases, and the number of cross-border transactions also increased significantly with the lifting of restrictions on travelling. However, the previous year's low base also needs to be taken into account.

The efficiency of domestic payments improved in 2021 as well, significantly approaching the average of the European Union. Mainly the spreading of electronic payment services and in parallel with that the decline in the use of cash for

transaction purposes affected the developments in the indicators that measure efficiency. Major progress was achieved in the area of the two indicators that reflect the efficiency of retail payments, namely the electronic payment of purchases as well as utility bills and other service charges, primarily as a result of the return of the development dynamics of payment card purchases seen prior to the pandemic and the further spreading of electronic payment solutions available in connection with bill payments. In the case of electronic purchases, Hungary also came significantly closer to the average of the European Union, with a major contribution of the exit of the United Kingdom from the European Union, which has a developed payment ecosystem and also had a great weight in the integration. Nevertheless, Hungary achieved considerable improvement in this area even without this technical effect. As far as bill payments are concerned, cash-based transactions are steadily losing importance in view of the continuous decline in the postal money order turnover and the spreading of related improvements as well as innovative, mainly card-based solutions, although major differences are identified in terms of the distribution across different sectors. In this regard there is still ample room for improvement in the case of less technology intensive, mainly classical utility service providers.

In spite of the package-priced account products appearing in banks' portfolios, unfavourable pricing structure concerning credit transfers is still a general obstacle to the further spreading of electronic transactions. As a result of the MNB's previous measures, larger banks already offer account packages that apply package-based pricing, and all of them offer credit transfers free of transaction fees at least up to a certain value or number of transactions. Nevertheless, still only a few customers use these services. This is also corroborated by the fact that the items related to the initiation of credit transfers continue to account for a major part of banks' revenues from payment services, and the highest growth compared to 2020 took place in this category. As a result, customers typically have to face high costs related to payment services, even with a smaller electronic payment turnover. According to our analyses, in order to significantly reduce banking costs, for the electronically active customers, i.e. around one third of the population, it is already worth to switch to an account package that applies package-based pricing. And with the spreading of payment solutions based on instant payment the clientele for whom a package-priced account product is a more favourable option is becoming wider and wider.

According to the payment inspections conducted in 2021, the operation of the payment service providers under review is satisfactory in general. Nevertheless, deficiencies were also found by the majority of the inspections completed. According to the findings of the payment inspections, the rules concerning the immediate crediting obligation of the amounts of incoming payment transactions continued to be the ones most often violated by payment service providers. At the same time, violation of the rules related to the compiling of statements of fees was a new type of fault, immediately becoming one of the most frequent breaches. In addition, violations of the provisions of the regulation regarding strong customer authentication as well as common and secure open standards of communication doubled in terms of their number and ratio in 2021.

The ratio of frauds to turnover is still insignificant in the case of payment card and other electronic transactions, but cases based on deception and psychological manipulation continue to spread, and – because of fraudsters' quick adaptation – the wider application of strong customer authentication could only partly meet the related expectations. The frauds detected on the card issuer side in 2021 and the losses caused by them do not even account for 1 hundredth of a per cent of the card turnover, which even shows an improvement compared to 2020 as a result of a dynamic expansion in turnover. Nevertheless, while it significantly increased security, strong customer authentication, which was extended to online transactions as well, could only partly meet the related expectations due to the changes that took place in the structure of frauds committed. While positive trends prevailed in connection with the decline in payment card frauds in 2021 H1, both the number and value of successful frauds grew again as of 2021 Q3. Another unfavourable trend is that the volume of losses charged to customers is growing considerably in parallel with an increase in the role of deception and psychological manipulation. Non-card frauds are also negligible compared to the total credit transfer turnover. Moreover, this ratio is still only one tenth of what is seen on the card issuer side. At the same time, it is necessary to pay increasing attention to prevention in order to avoid further escalation of negative developments, which requires the strengthening of customer education from banks as well. The MNB is providing support with the planned publication of a recommendation regarding the prevention of frauds, and the introduction of a central system to detect fraud is also being considered.

PAYMENT AND SECURITIES INFRASTRUCTURES

Compared to the previous year, there was a dynamic increase in turnover in the Hungarian payment systems in 2021. In addition, their operations remained highly reliable

and safe. The value of VIBER turnover was 26 per cent up, while the number of transactions remained practically unchanged, and the system operated with high availability. In parallel with the expansion in turnover, due to shorter incident times of service outages there was also a further slight decline in service continuity risk in 2021 compared to the previous year. Moreover, remote operation introduced in view of the pandemic did not cause problems either. Compared to the previous year, the total turnover value and number of transactions on the three platforms of the ICS increased by 19 per cent and 8 per cent, respectively. In parallel with that, the distribution of transactions across the platforms continued to change, as 2021 was the first complete year when instant clearing was available for the clients of ICS participants in all the twelve months. In parallel with the dynamic expansion in turnover the ICS continued to operate with high availability and safely, as in previous years. Remote operating and shared operation between sites due to the pandemic did not cause any problems in the provision of services. In 2021, the forint turnover of CLS more than doubled. The increasing activity of the 5 new members that joined CLS forint settlement in 2020 greatly contributed to the growth, and also an increasing number of those entities who joined earlier use the service offered by CLS. The turnover expanded in parallel with stable operational security in the case of the CLS as well.

In 2021, supported by the expansion of the monetary policy instruments as well, participants of the payment system adequately managed their liquidity for performing their payment turnover. In relation to the liquidity of the participants of the payment system no changes in the central bank toolkit took place in 2021. The level of liquidity in VIBER declined steadily in 2021, and compared to the high base in the same period of the previous year it was 18 per cent lower in Q4, but this level continues to ensure the smooth functioning of the payment ecosystem. The narrowing of liquidity was attributable to the decline in the intraday credit line, which the gradual increase in the account balance was unable to offset. As a result of the adequate liquidity in VIBER, still only a very low portion of transactions were queued due to shortage of liquidity, therefore clearing and settlement risk remained low. In 2021, the participants provided sufficient collateral for nights, weekends and bank holidays as well in the instant clearing of the ICS, as instant borrowing was hardly necessary. In addition, the number of transactions affected by liquidity shortage in the ICS intraday clearing continued to increase, and thus roll-overs took place on 37 occasions in total in 2021. The lack of funds was significantly attributable to liquidity management issues. Payments to CLS did not cause any liquidity problems in VIBER, and thus the related clearing and settlement risk remains low.

On 6 December 2021, KELER Central Depository Ltd. put its new securities settlement system into live operation within the framework of the so-called KELER Services Development Programme (KSDP). Compared to the previous year, in 2021 the value and the number of transactions settled in KELER rose by 17 per cent and 14 per cent, respectively. The level of availability of business activities slightly declined compared to the previous periods, but the reported availability to counterparties remained above 100 per cent in nine months of the year.

Overall, the turnover of markets cleared by KELER CCP increased by 46 per cent compared to the previous year; of them, the performance of energy markets was outstanding. Capital market transactions cleared by the central counterparty increased by 1 per cent in 2021, a 15 per cent fall in the total turnover was seen in the case of spot capital market transactions, while a rise of 30 per cent took place in the forward markets. The turnover nearly tripled in the case of spot gas markets cleared as central counterparty, while in the case of derivative gas markets a twofold growth was observed compared to the previous year. These effects resulted in a total growth of 46 per cent in the turnover. The level of availability of business activities somewhat declined in the case of the services of KELER CCP as well. Just like in the previous year, the number of incidents affecting customers as well was two, although in 2021 they lasted for longer, i.e. more than 30 minutes.

CURRENT ISSUES OF PAYMENTS AND FINANCIAL MARKET INFRASTRUCTURES

One of the MNB's most important payments related objectives is to support the further dynamic growth of electronic payments, which it intends to implement in the third phase of the development of the instant payment ecosystem through regulatory steps and enhancements needed for a faster spreading of end-user solutions that are easy to use in any payment situation. Further simplification and acceleration of the related payment processes are needed for instant payment to become a relevant option in any payment situation for customers. In order to achieve this, the MNB is primarily striving to exploit the opportunities inherent in the domestic QR code standard and request-to-pay service as efficiently as possible. Within that, the MNB's main goal is to terminate market fragmentation by regulating the QR code reading ability and the ability to receive request-to-pay messages. In addition, it is elaborating a set of rules for the visual identity elements that can be used in commercial payment situations, allowing – as a result of the single appearance – consumers to easily identify the situations where instant payment is available. It is also an important aspect that the retail sector should be fully aware of the use of the

various payment solutions already prior to the wide-ranging appearance of the services. This requires a comprehensive educational and communication campaign, in which the MNB is also planning to take an active part. In order to further improve the situation of retailers and to increase everyday usability, the MNB is also planning the regulation and technical standardisation of the positive feedback indicating the success of transactions.

Regarding both households and companies, the MNB repeatedly assessed the factors behind choosing between payment methods as well as the social costs of domestic payments. Many electronic payment solutions are available that can significantly ease our everyday life, and as a result of that as well, in 2020 already 80 per cent of the adult population used electronic payment methods. Nevertheless, major differences are perceived in connection with the use of payment methods across the individual groups created on the basis of sociodemographic factors. Younger age groups as well as strata with higher qualification and per capita income prefer to pay electronically, although the spreading is still hindered by cash income and the pricing of services. Size is a significant influencing factor in the corporate sector. While cash plays an extremely important part in payments in the case of smaller retailers, the role of card acceptance is significant in the case of bigger ones, whereas credit transfers dominate in the case of large corporations. At the same time, the use of payment methods is also related to the value of transactions. Higher-value payments are more typical conducted through credit transfers, while there are extremely many low-amount cash transactions. By 2019 the per transaction social cost (time and resources spent on payments) of payment methods adjusted for the increase in wages and inflation declined in the case of card, cash and credit transfer as well compared to 2009, which shows improving efficiency.

During the past one and a half years there were many changes in the rules concerning the Széchenyi recreation cards (SZÉP cards), which primarily aimed at offsetting the negative effects of the coronavirus pandemic on tourism and the catering industry, thus significantly affecting the changes in the related turnover. Of the changes in legislation, in the first place it is necessary to mention the reduction of the tax burden on SZÉP cards as well as the usability of funds available on the individual sub-accounts for payments for services belonging to other sub-accounts. As a result of the changes in legislation, more and more employers and employees opt for this element of the fringe benefit system. Accordingly, in addition to the number of SZÉP cards and their balances, there were major changes in terms of the transaction turnover as well. The number of cards issued increased by 5 per cent between January 2020 and December 2021, and exceeded 2.2 million. Also, the

appropriation utilised rose significantly, which is also well-reflected in the 24 per cent annual average growth in the monthly balances held on the cards compared to 2020. In addition, compared to 2020, SZÉP card holders carried out 49 per cent more transactions a month on annual average. It is an important change that consumers prefer to use the balance held on the recreational and accommodation sub-accounts for funding typically lower-amount, one-off catering-type spending.

In parallel with major changes in international payment systems, the increase in the role of digitalisation, the loss of importance of cash and the appearance of various crypto-assets, the examination of the issue of central bank digital currency is of growing importance. Of the various international initiatives, the European Central Bank's project that examines the questions of the adoption of a digital euro may be a major one for Hungary, since it may fundamentally transform the functioning of the financial sector of the euro area, and thus it may also have an indirect impact on Hungarian payment service providers as well. The European Central Bank sees great potential in the central bank digital currency in the areas of supporting the digital transition of the European economy and maintaining the European sovereignty of the payments market, and thus the two-year examination period that was announced in 2021 will be of particular importance. At the same time, not only those projects can be useful that examine the so-called retail central bank digital currency available for households, but also the ones that examine the version applicable in interbank clearing, as they may create the possibility of simple interbank clearing and settlement in various currencies. Good examples for that are the Project Jura implemented between the French and Swiss central banks or the ongoing Multiple CBDC Bridge Project with the involvement of Hong Kong, China, Thailand and the United Arab Emirates. In addition to the above, more and more innovative digitalisation solutions also tend to appear in the area of securities infrastructures; the increasing of operational efficiency is the primary objective here as well. Of the ongoing projects, infrastructural cooperation is of special importance where innovative solutions are planned to be developed in the areas of both money side and securities side processes.

The MNB has always treated achieving the innovation and competition stimulating goals of the PSD2 as priority, and took numerous steps in order to promote them last year as well. The MNB worked out and implemented a complex action plan to support the spreading of open banking and remove the obstacles. Within that framework, it issued an MNB recommendation about hindrance, and conducts a sector-level inspection with a technical focus in connection with application programming interfaces. Also in order to

promote the spreading of open banking, the European Banking Authority adopted a proposal for amendment in connection with the regulation containing its regulatory technical standards related to the PSD2 strong customer authentication, as a result of which a new mandatory exemption rule would apply to account information service providers, which points to the development of the market related to open banking, and may facilitate the achievement of the objectives of the PSD2. Another PSD2-related current issue is that the application of strong customer authentication has been mandatory in the case of online payment card purchases as well since 1 January 2021. This major change has become a part of our everyday life, but many customers are still not used to the application of exemption rules, i.e. when strong customer authentication is nevertheless not required of us. The MNB considers it important to inform people about the rules and conditions of the exemptions from strong customer authentication through as many channels as possible.

Relying upon the financial proposal package of the European Commission issued in September 2020, significant regulatory changes are foreseen in the European scene in order to support the further development of financial services. The retail payments strategy of the European Central Bank and the European Commission also expressly called attention to the possibilities of electronic identification solutions in payments, where customers may have an opportunity to participate in account opening and customer identification processes or approve payment transactions comfortably, without using paper-based documentation. At the same time, the current regulation has numerous deficiencies, which prevent the wide-ranging use of electronic identification solutions. Therefore, the European Commission submitted a regulatory proposal for the mandatory introduction of a mobile wallet at Member State level, in which consumers could store any of their certificates, identification documents or attributes in a secure, digital format, and would be able to share them with others online and in the physical environment as well. In addition, the examination by the European Parliament and the Council as well as the preparation of the related legislative texts are going on in connection with the DORA, which aims at the promotion of the cyber security of financial services and the management of operational risks in a wider sense; the MiCA, which formulates the uniform, detailed reporting, consumer protection and supervisory rules concerning the issuance of and trading in crypto-assets; as well as the draft regulation regarding the conditions of use and operation of the distributed ledger technology and also the permission and supervision of use, as well as regarding the cooperation between national and European authorities.

2 Payment service developments

2.1 DEVELOPMENT OF ELECTRONIC PAYMENTS

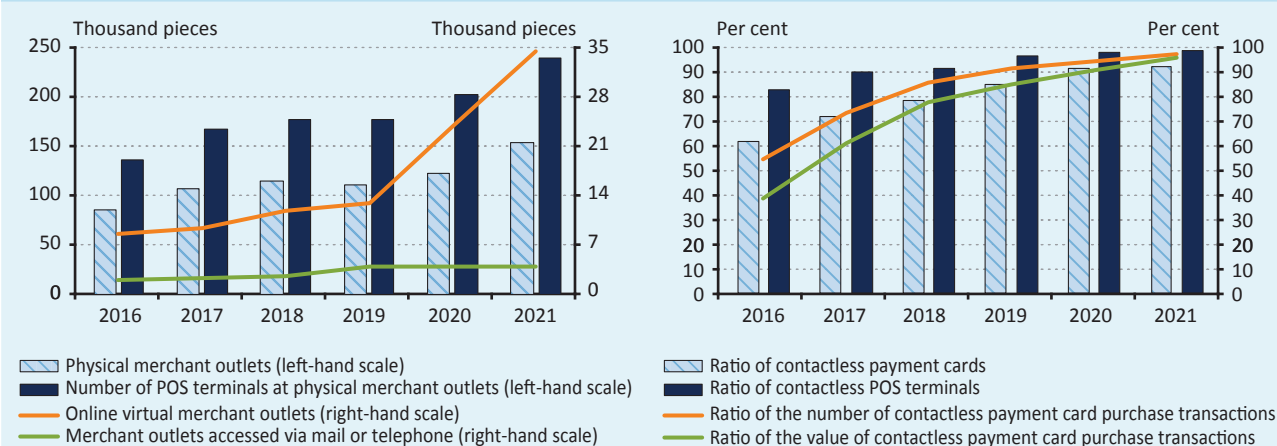
2.1.1 Improvements in the electronic payment infrastructure

The domestic electronic payment infrastructure was characterised by dynamic development in 2021 as well, which was primarily the result of the transformation of consumer habits due to digitalisation processes. Although there were no major changes in the number of payment accounts and cards as well as in their composition during 2021, and the minimal change that took place can rather be considered only technical (e.g. the effect of card replacement programmes that were brought forward), the impact of the spreading of digitalisation was strongly perceived. Accordingly, consumers are becoming increasingly open to using non-cash payment instruments and trying innovative electronic payment solutions. At the end of 2021, already 68 per cent (6.7 million pieces) of the 9.8 million payment cards issued in Hungary were used for purchase transactions, corresponding to an increase of nearly 220 thousand pieces compared to the end of the previous year.

Increases in the number of physical merchant acceptance points and virtual merchant outlets by 26 and 44 per cent, respectively, resulted an outstanding improvement

in payment card acceptance network. At the end of 2021, payment transactions conducted by card was possible at nearly 155 thousand physical acceptance points and 34 thousand virtual merchant outlets in the network of Hungarian payment service providers. The main contributor to the increase in the number of physical acceptance points by nearly 32 thousand was the provision of the Act on Trade,¹ pursuant to which the merchants obliged to use online cash registers (OCRs) have to provide the possibility of electronic payment as of 1 January 2021. Most merchants and service providers first strived to comply with this requirement by the installation of card acceptance service, although instant payment may also be a relevant option, which, in many cases, may even be a simpler and more efficient solution for smaller merchants. Dynamic growth in the number of virtual merchant outlets was already observed in the previous years as well. Last year, however, this increase was further accelerated by the changing consumer habits in view of the coronavirus pandemic and, in parallel with that, by the further spread of various webshops and home delivery services. It is also important to note that the contactless card technology, which had been the driver of development concerning electronic payments in the previous years, became completely widespread by the of end 2021. 93 per cent of the 9.8 million cards issued in Hungary and more than 99 per cent of the nearly 239 thousand POS terminals supported contactless payment. (Chart 1)

Chart 1
Development of the payment card acceptance network and the contactless card technology in Hungary



Note: The scope of data presented regarding the payment card acceptance infrastructure does not show the expansion of foreign service providers in Hungary that were not obliged to report data to the MNB until the beginning of 2021, at the same time, the number of card-acquiring merchants may be several thousands more due to the cross-border service provided by them. As a result of the expansion of reporting obligations, the MNB is having an increasingly comprehensive picture of them, although the presentation of the related data is still prevented by the lack of completeness.

¹ Act CLXIV of 2005 on Trade

Box**The spread of mobile wallet and other innovative solutions relying upon payment cards**

Consumers' openness to innovative electronic payment solutions is well reflected by the fact that within all payment cards the number and share of cards registered in mobile wallet applications is growing dynamically in parallel with the appearance and rapid spread of service providers that are independent of banks. The number of these cards increased by nearly 470 thousand in a year, approaching 1.3 million, which represents an expansion of 58 per cent. It is important to note, however, that in the reporting to the MNB only bank applications and those bank-independent mobile wallets are taken into account with the providers of which domestic banks established cooperation, and thus the number of cards actually registered in mobile wallets may be higher than what is presented here. At the same time, the most important bank-independent service providers are covered without exception. (Chart 2)

In addition, it is also important to emphasise that the mobile wallet turnover is increasing to a greater degree than registrations, which indicates that the consumers who try the service once like to have recourse to the comfortable and easy-to-use solutions that allow the substitution of physical plastic cards at other times as well. Annual turnover expanded by 112 and 114 per cent in terms of the number and value, respectively, and thus by the end of 2021, around every tenth payment card purchase transaction was conducted using this technology. Another visible change is that while in 2020 Q1 the number of transactions on a card registered in a mobile wallet was only 23, this number already increased to 34 in 2021 Q4. (Chart 3)

Chart 2
Changes in the number and ratio of payment cards registered in mobile wallets

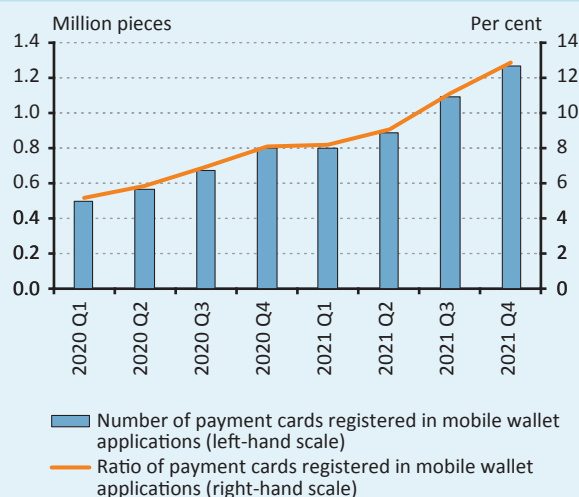
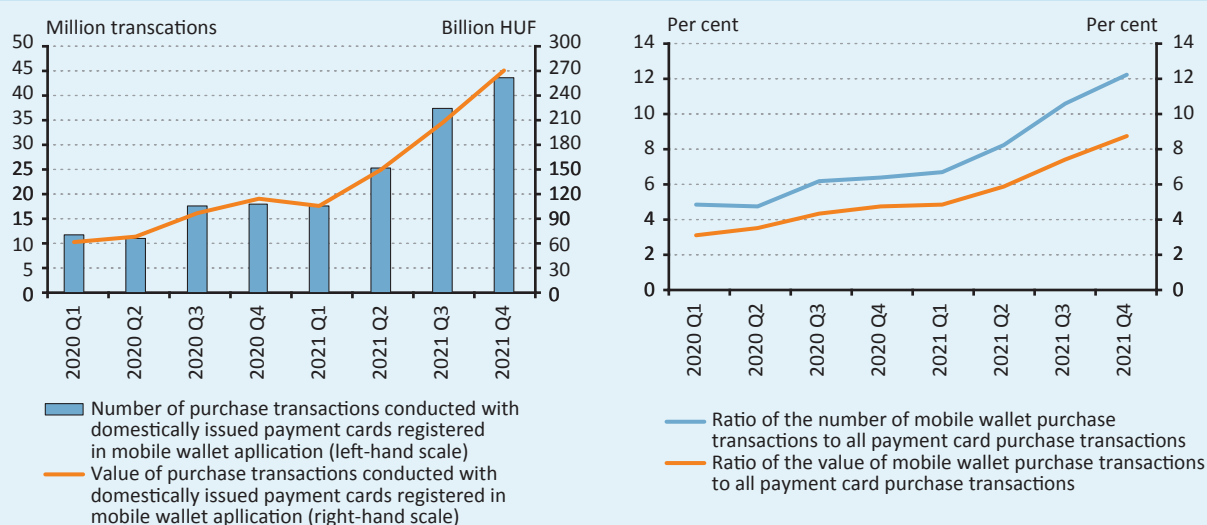
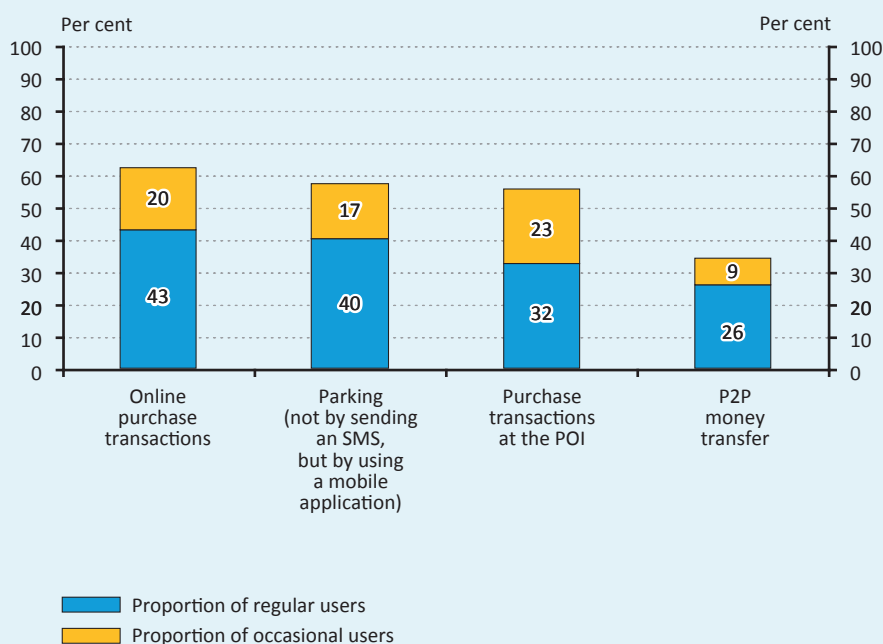


Chart 3
Changes in and ratio of purchase transactions with cards registered in mobile wallets



According to the findings of the MNB's 2020 household survey, nearly one third of the population use their mobile phones for payments. Nearly two thirds of mobile payment users opt for this solution for online purchase transactions, around half of them for parking and paying in shops, and one third for sending money between private persons. As for the frequency of use, however, it is true for each situation that frequent users of mobile payment outnumber occasional mobile payers. At the same time, it is mostly true for the sending of money between private

Chart 4
The ratio of mobile payment in payment situations (2020)

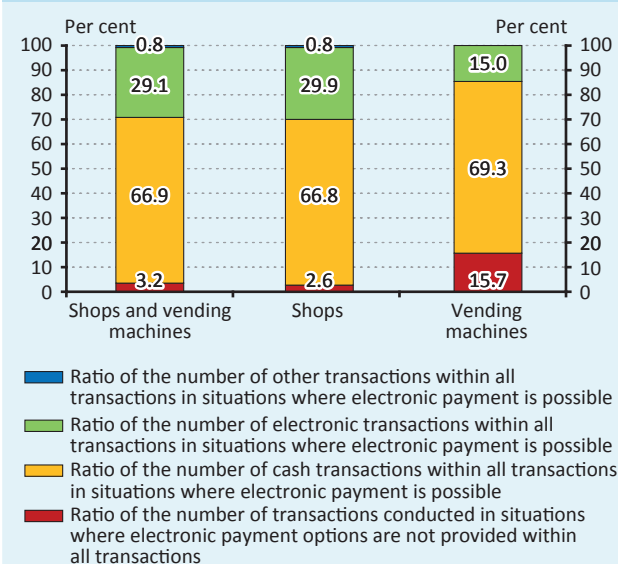


persons that those who use their mobile phones for this purpose usually use this method regularly. (Chart 4)

In addition to innovative technologies with payment cards, emerging FinTech players are cutting out larger and larger shares of the market of payment services in Hungary as well. At the same time, it is necessary to note that in times of initial campaigns and major marketing activities applied by them, customers' propensity to register is typically high, but enthusiasm declines as time goes by. Another important aspect is that – concentrating typically on a limited segment of the payments market – the majority of them have much narrower ranges of services than traditional banks. It is partly attributable to their respective business strategies as well as to the status and operating licence of the given institutions. It also means that for the time being they are unable to completely replace the service portfolio of commercial banks. Nevertheless, the data available for the MNB also show that in addition to classical bank relations more and more domestic consumers use some kind of innovative payment service, primarily based on a closed solution (e.g. electronic money). The most important FinTech service providers present in Hungary already keep records of millions of user accounts, which is a definitely high number in the light of the nearly 6.9 million consumer accounts held primarily for payment purposes by traditional banks. At the same time, it is also well visible that the turnover performed by these actors is marginal compared to either the classical payment card or credit transfer turnovers. It means that consumers use these services only in a limited number of payment situations. Moreover, among the major innovative service providers a process started, within the framework of which they are shifting towards the provision of complete bank services, and thus they become quasi integrated in the traditional banking system from both the business and legislative sides.

According to the data of online cash registers and vending machines, the lack of electronic payment options does not hinder their spreading any longer. Examining the shops obliged to use OCRs² it is seen that although the ratio of shops allowing electronic payment is not 100 per cent³, 97 per cent of the registered turnover is conducted in these shops, and thus the lack of electronic acceptance affects an extremely small portion of the turnover. Looking at the shops and vending machines separately, as expected, the lack of the possibility of electronic payment acceptance is observed for a lower proportion of shops, in the case of 2.6 per cent of the turnover, and for 15.7 per cent⁴ of the vending machines not obliged to accept electronic payment. (Chart 5)

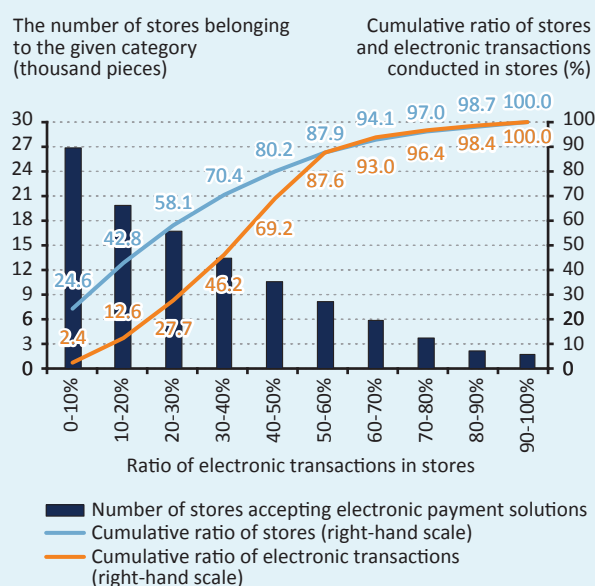
Chart 5
Distribution of the turnover of vendors and vending machines obliged to use OCRs (2021)



The share of electronic transactions within the total turnover is already 50 per cent or more in the case of one fifth of the shops providing electronic payment acceptance and obliged to use OCRs. Electronic payment is already possible in most places, allowing the use of these data to monitor the effects of the stimulation of electronic transactions. According to 2021 data, there are shops where the ratio of electronic transactions is already very high, above 90 per cent, and around 1 per cent of the electronic

payment turnover is conducted there. Although only 2 per cent of the shops belong to the aforementioned category yet, it is already true for one fifth of the shops that more than half of the purchases there are settled electronically. At the same time, the ratio of electronic transactions is still low (between 0 and 10 per cent) in the case of one fourth of the shops. (Chart 6)

Chart 6
Distribution of shops providing electronic payment acceptance and obliged to use OCRs as well as of the number of electronic payments conducted therein according to the ratio of electronic payments by shops (2021)



2.1.2 Penetration of electronic payment transactions

The outbreak of the coronavirus pandemic in 2020 had a major impact on payment service developments in Hungary, some of which remained with us in 2021 as well due to the returning waves of the pandemic. Nevertheless, the development of electronic payments returned to pre-pandemic levels, or even surpassed them in many respects. The dynamic growth in the number of payment card purchase transactions, which had been the main driving force behind the expansion in electronic payments,

² Vendors include not only the physical merchant units, but also other units, belonging to the service sector, obliged to use an online cash register (OCR) (e.g. catering units, accommodation service units, service stations, taxi). Due to the district-level OCR database, the data do not allow a definite identification of shops, and thus in the case of the analyses we examine the aggregate data by district of taxpayers' so-called retail units that have the same activities and are called shops for the sake of simplicity.

³ We draw a conclusion from electronic payments regarding the degree of acceptance.

⁴ Pursuant to Decree 31/2016. (IX.2.) of the Minister of National Economy, within the turnover of vending machines it is not mandatory to separately report electronic payments. Accordingly, the proportion of transactions conducted in situations that do not provide electronic payment options may be lower than the value indicated.

returned to the pre-pandemic level. The annual increase of 21 per cent can be considered impressive even in spite of the lower expansion in 2020 and the accordingly lower than usual base, mainly also because the number of cash withdrawals declined further by more than 2 per cent. In addition, it is to be mentioned that following the turning point that occurred in 2020, the gap between the values of the 1285 million payment card purchases and the 91 million cash withdrawal transactions conducted with payment cards became even wider in favour of the purchases. In 2021, the total value of payment card purchases (HUF 10.7 thousand billion) exceeded that of cash withdrawals conducted with payment cards (HUF 8.6 thousand billion) by already nearly 25 per cent. At the same time, in parallel with the unfavourable inflation trends as well, the amount per one cash withdrawal increased to above HUF 99 thousand by the end of the year, corresponding to a growth of more than 7 per cent compared to the end of 2020. (Chart 7)

In addition to payment card purchases, credit transfer turnover also expanded considerably. Moreover, instant payments reached the level that the expansion in card turnover has shown for years, further contributing to the spread of electronic payments. In 2021, customers initiated nearly 415 million credit transfers in a value of some HUF 986 thousand billion, representing increases of 9 and 18 per cent, respectively, compared to 2020. Excluding the effect of the incomplete year (the instant payment service became available for customers on 2 March 2020), examining the turnover between 2021 Q2 and Q4 compared

to the same period of the previous year, instant payment turnover expanded by nearly 23 per cent in terms of the number of transactions and by 39 per cent in value. In 2021, instant payments already accounted for nearly 40 per cent of all domestic credit transfer transactions. (Chart 7)

Major differences are observed not only with regard to payment methods, but also in terms of payment situations, which is well represented by payment card purchases. The most visible change resulted from the gradual lifting of the restrictions on travelling introduced due to the outbreak of the coronavirus pandemic. Following the previous major fall, also as a result of the low base of 2020, physical purchases abroad were up significantly, by 43 and 47 per cent in terms of number and value, respectively in 2021. Nevertheless, domestic physical purchases continue to dominate. Moreover, compared to previous years it is a remarkable change that the growth rate of orders through the Internet, mail or telephone, which do not require the physical presence of the card, shows deceleration in spite of the significant expansion in the related infrastructure, which is also a result of consumers' preference to return to the physical space after being confined due to the restrictions and general cautiousness caused by the pandemic. This is also well visible in the return of the physical transaction turnover to the pre-pandemic level. Nevertheless, due to the dynamic development of domestic webshops and home delivery services, the growth rate of cross-border online, mail and telephone turnover shows a greater slowdown. (Chart 8)

Chart 7
Turnover and annual change in turnover of the main payment methods

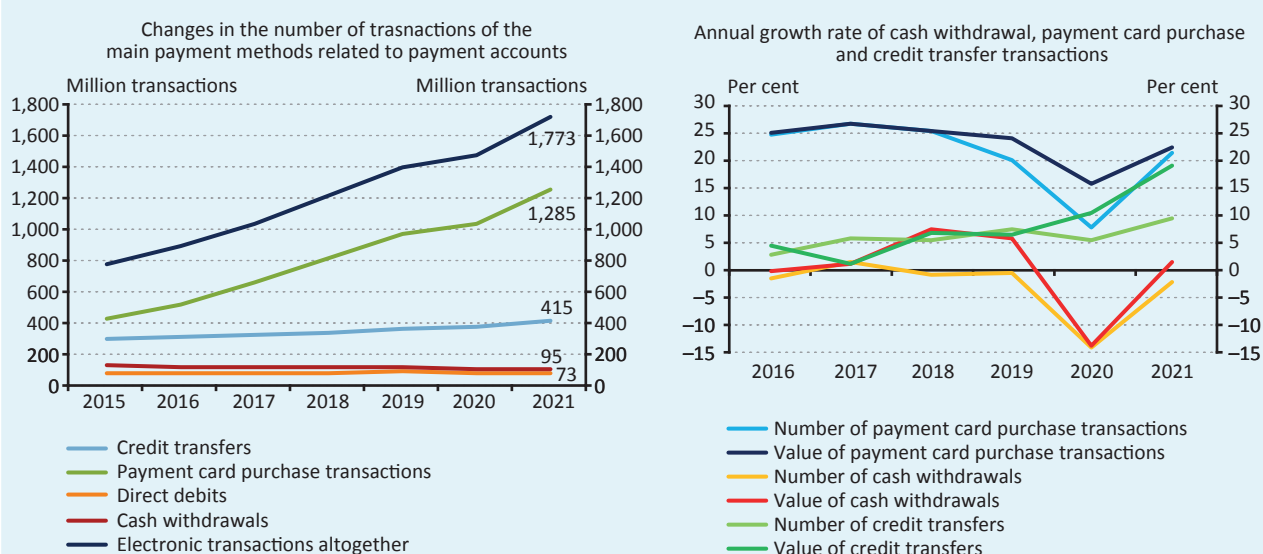
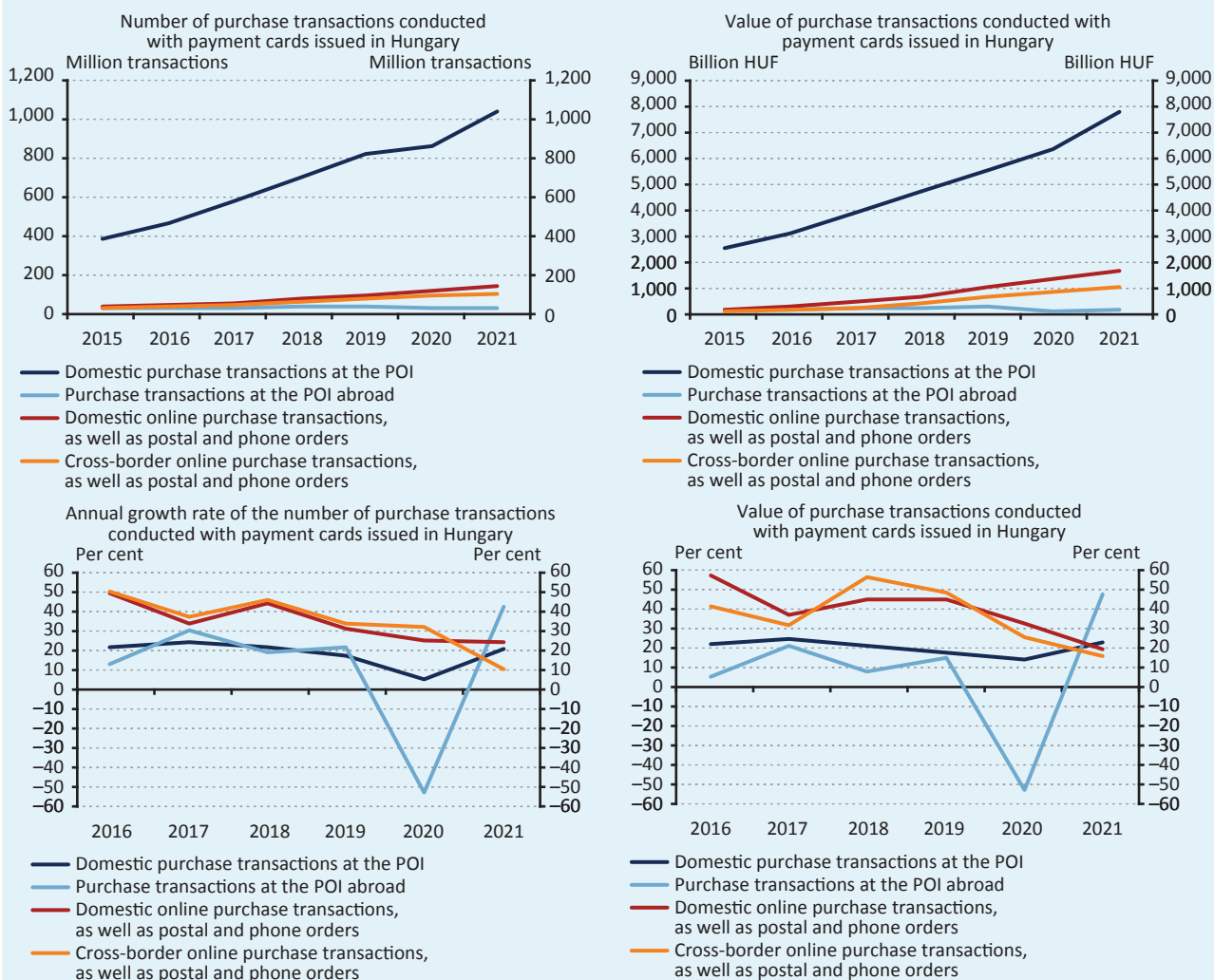


Chart 8

Turnover and annual change in turnover of payment card purchase transactions by payment situation



A significant portion of payment card purchases is still concentrated in the value categories below HUF 50 thousand, where in the cases requiring the physical presence of the card the ratio of the use of the contactless technology is already above 97 per cent. In a breakdown of card purchases by value categories, 61 per cent of the transactions was below HUF 5 thousand and 80 per cent of them was below HUF 10 thousand in 2021. In addition, most of the turnover, i.e. 98 per cent, concentrated in the segments below HUF 50 thousand. In this regard there was no major change compared to 2020, although while the role of the lowest value categories slightly increased, that of the higher ones fell minimally. Although the ratio of contactless purchases typically continues to decrease in proportion to the increase in transaction value in the case of card-present physical purchases, there was a major step forward in this respect compared to 2020. Compared to the same period of the previous year, in the last quarter of 2021, in the value ranges between HUF 5 thousand and HUF 10 thousand and between HUF 10 thousand and HUF 50 thousand the ratio

Chart 9

Purchase transactions conducted with payment cards issued in Hungary by value categories

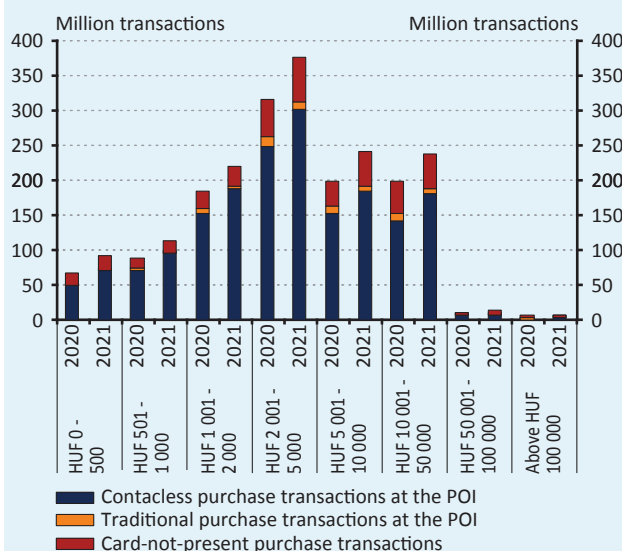
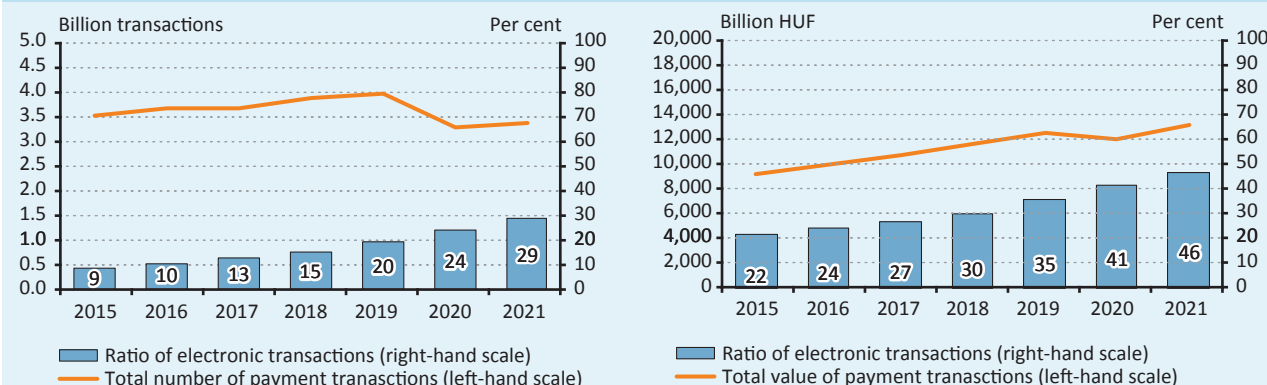


Chart 10

Number and value of payment transactions in the databases of online cash registers and the ratio of electronic payments⁵



of contactless purchases was 3 and 4 percentage points higher, respectively. In addition, the ratio of contactless transactions is already well above 90 per cent also in the value ranges above HUF 50 thousand as a result of the 5 percentage point rise that took place. (Chart 9)

The growth rate of the aggregate ratio of electronic payments continues to be high. By the end of 2021, nearly one third of the number and almost half of the value of the purchases recorded on online cash registers and vending machines were settled electronically. The number of purchases recorded on online cash registers and vending machines was close to 3.5 billion in 2021, which is 2 per cent more than in 2020, but still 15 per cent less than prior to the pandemic. The total value of purchases was HUF 13 thousand billion in 2021, exceeding the value for 2020 by 10 per cent and for the pre-pandemic period by 4 per cent. The increased growth in the electronic payment ratio observed during the pandemic is still perceptible; a 5 percentage point rise is seen both in terms of number and value compared to 2020. Accordingly, in 2021 the annual ratio of the number of electronic payments recorded on online cash registers was 29 per cent, while the annual ratio of their value amounted to 46 per cent. Against this background, the gradual increase was perceived within the year as well; in December these values already reached as much as 32 per cent and 49 per cent, respectively. (Chart 10)

2.1.3 Efficiency of payments in Hungary in a European comparison

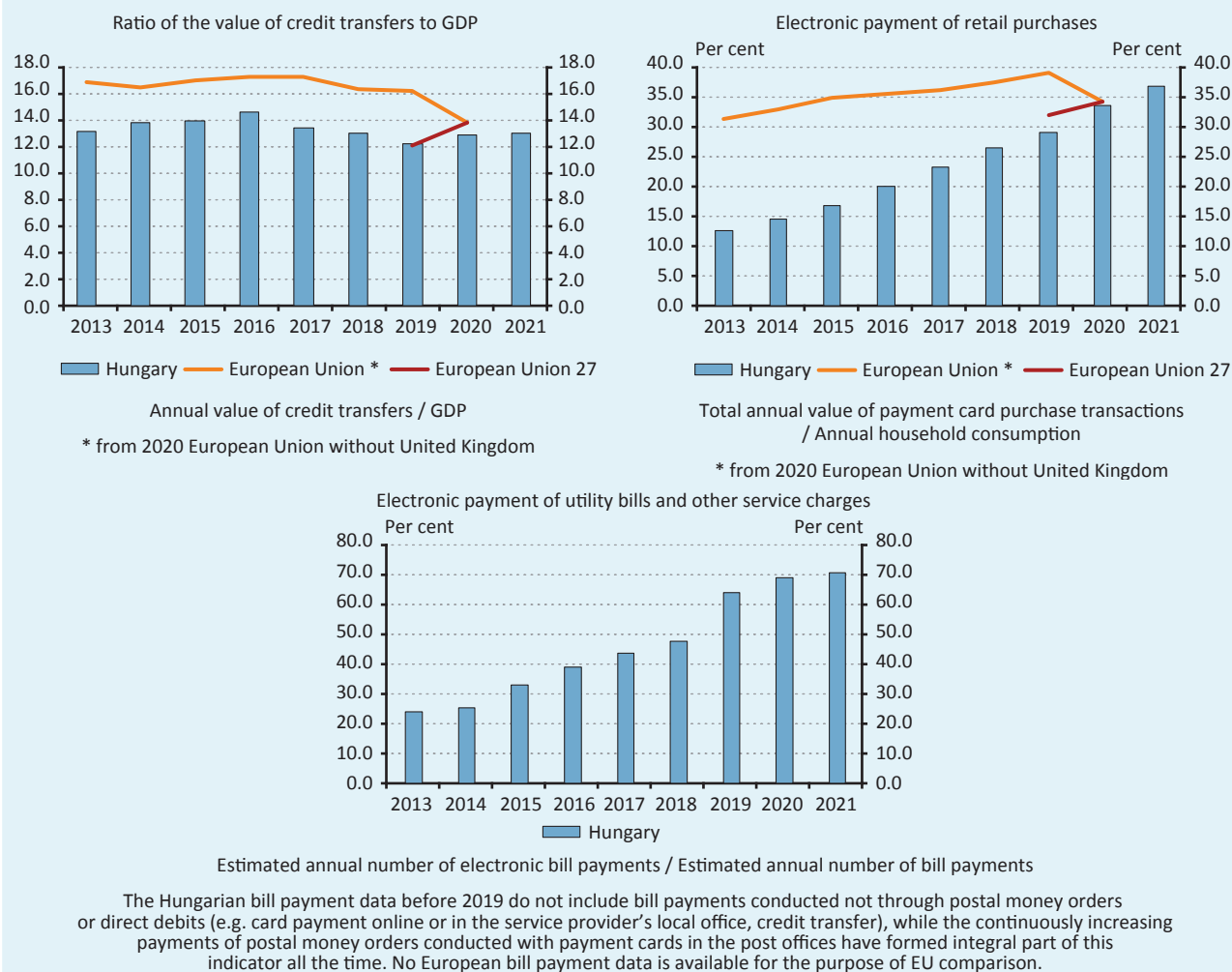
The efficiency of domestic payments continued to improve in 2021 as well. Moreover, Hungary significantly approached the average of the European Union. In view of the changes in payment habits due to the pandemic

and digitalisation processes, electronic payment services gained further ground, while the use of cash for transaction purposes declined in parallel with that, which also had a benign impact on the developments in the indicators that measure the efficiency of payments. Even if to a minimum degree, but, as a result of a major increase in credit transfer turnover (which was greatly attributable to the instant payment service), the ratio of credit transfers to GDP improved further in spite of the expansion in GDP. At the same time, the favourable value of the indicator is also attributable to the fact that most of the corporate sector's payments – especially the high-value transactions of large companies – are conducted through credit transfers, and the expansion in corporate turnover, which picked up in parallel with the economic upswing, pulled the value of the indicator further up. (Chart 11)

In 2021 significant progress was also made in the area of the two indicators that reflect the efficiency of retail payments, namely the electronic payment of purchases as well as utility bills and other service charges. This was primarily the result of the return of the pre-pandemic development dynamics of payment card purchases and the further spreading of the available electronic payment solutions related to bill payments. Moreover, Hungary significantly approached the EU average in terms of the credit transfers-to-GDP ratio and the electronic payment of retail purchases, with a major contribution of the exit of the United Kingdom from the European Union as well, which has a developed payment ecosystem and had a large weight in the integration. Nevertheless, even without this technical effect, taking into account only the 2019 and 2020 figures of the current 27 EU Member States, Hungary reached a nearly twofold improvement in terms of the electronic payment of retail purchases compared to the previous year. (Chart 11)

⁵ While electronic purchases regarding the period between 2015 and 2018 contain only traditional payment card purchases, as of 2019 they also include other electronic payments – such as instant payments and SZÉP card transactions – that can clearly be identified in the data base.

Chart 11
Changes in indicators measuring the level of development of Hungarian payments



Note: There can be deviations from previously published data due to modifications by data providers.

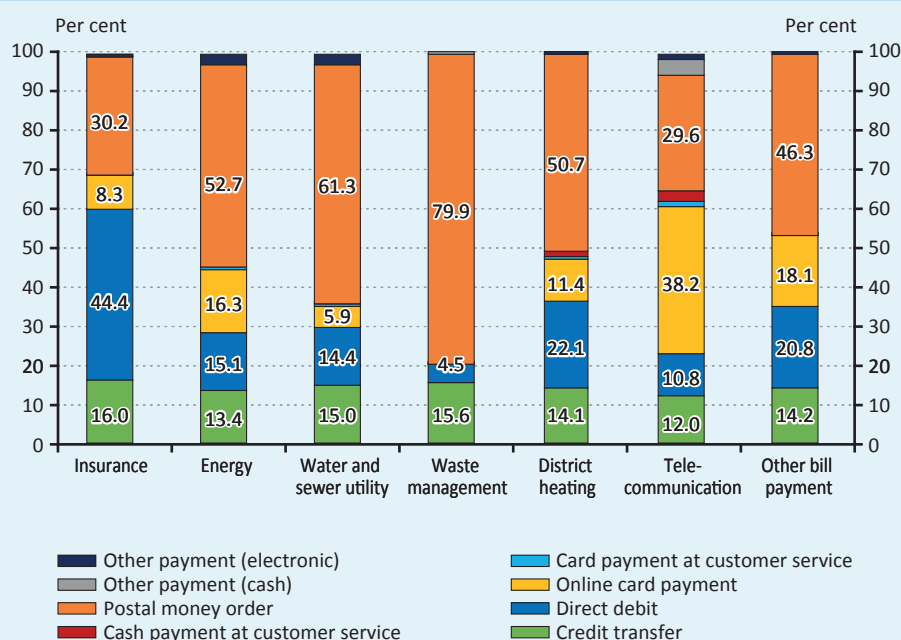
Source: MNB, HCSO, ECB, Eurostat

Significant progress was achieved in the past years in the area of bill payments, which was primarily the result of service providers motivating customers to change over to electronic invoicing as well as of the impact of the coronavirus pandemic on payment habits, although still major differences are seen across sectors. Although cash-based bill payments are steadily losing importance as a result of the continuous decline in the turnover regarding yellow and white postal money orders and as a result of the related innovations (e.g. introduction of the possibility of card payments at post offices, availability of a QR code-based mobile postal money order service), major differences are identified in terms of the distribution across sectors. Development shows a dynamic picture mainly on the side of telecommunication service providers, which are more mature from a technological aspect, where card payment, which offers simple and comfortable opportunities through customer service on the Internet and/or dedicated mobile application, is playing an increasingly dominant role. In

the case of insurance services, direct debit continues to be the most popular payment method, which is primarily attributable to insurance companies' business policies, typical bank partnerships as well as the protocols of concluding contracts with customers. (Chart 12)

Nevertheless, bill payment using postal money orders is still the leader in the case of classical utility services. Waste management is outstanding in this respect, as the ratio of postal money orders is 80 per cent here. It is important to note, however, that as a result of the past years' postal improvements, 37 per cent of the postal money order payments are already conducted using some kind of electronic payment method, which is a more than 3 percentage point step forward compared to 2020. The ratio of credit transfers was nearly the same – between 12–16 per cent – in each sector in 2021, which shows that the availability of the instant payment service and the widening possibility of the sending of request-to-pay messages were

Chart 12
Distribution of the number of bill payments by sectors (2021)



not yet perceived significantly in terms of bill payments. Nevertheless, more and more actors are examining the opportunities inherent in innovative solutions relying upon the new service, including the payment initiation based on the Hungarian QR code standard and the request-to-pay service. (Chart 12)

Instant payment may be especially advantageous for the more cost sensitive service providers, as the receipt of credit transfer transactions is typically free of charge on the basis of bank conditions, contrary to card payments or the solutions based on postal money order, where fees as a proportion of the turnover are charged. Moreover, in most cases there is no need for major improvements either for the implementation of bill payment solutions based on instant payment. Similarly to the postal money order solution, but – depending on the situation – even without the involvement of other partners, bill issuer service providers can place QR codes complying with the MNB standard and containing bill payment data on electronic or paper-based invoices. As a result, customers can simply and comfortably initiate instant payment transactions in their mobile banking application by scanning the QR code shown on the invoice. In addition, in the case of the request-to-pay service it is also not absolutely necessary to rely upon cooperation with other partners, as it is also possible to directly join the central platform operated by GIRO that processes the request-to-pay messages, which may be a relevant alternative for bigger service providers. It supports the applicability of these solutions that the receipt

of request-to-pay messages and the option of QR code-based instant payment is available in more and more banks' mobile banking applications. Accordingly, bill issuer service providers may become more and more convinced that instant payment is a feasible option for their customers as well. In addition, the MNB is striving to create increasingly easy-to-implement solutions through the continuous development of the instant payment ecosystem as well.

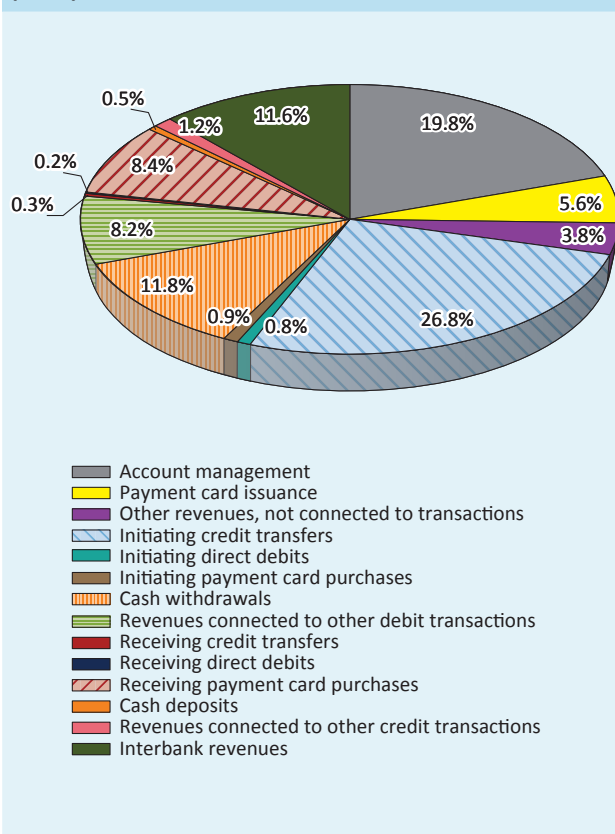
2.2 COST OF ELECTRONIC PAYMENTS

2.2.1 Revenues related to payment services

As a result of a dynamic expansion in the payment turnover of electronic payment methods, domestic actors' revenues from payment services increased considerably in 2021 compared to the previous year. Nevertheless, in spite of the positive steps forward, the pricing of credit transfers is still unfavourable for customers because of the items burdening the transactions directly. In 2021, payment service providers in Hungary realised revenues amounting to HUF 613 billion, which exceeds the previous year's value by 10 per cent, i.e. HUF 58 billion. At the same time, it is also to be mentioned that primarily due to the effects of the coronavirus pandemic, the sector closed 2020 with a smaller profit than usual, and thus the effect of the lower base needs to be taken into account. It is unfavourable that within revenues the items related to credit transfer initiation continued to account for the largest part, with a nearly 27 per cent share. In addition, with 12 per cent, this is the

category where the highest growth took place compared to 2020. Even in parallel with the appearance and gradual spreading of package-priced account products it means that – as opposed to payment cards – in the case of credit transfers the vast majority of consumers still face minimum and value-based fees directly related to the initiation of transactions, which does not encourage the use. (Chart 13)

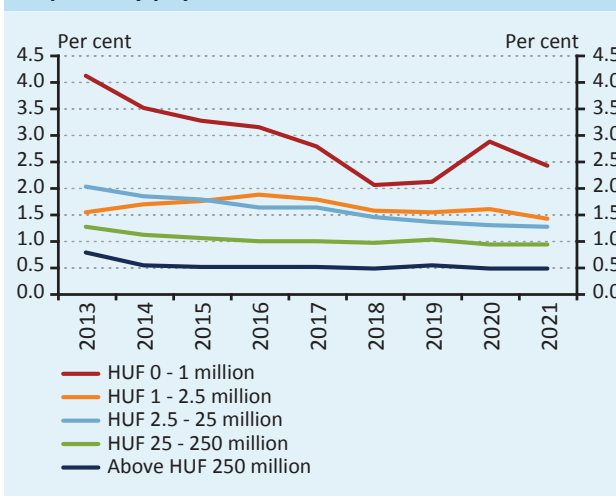
Chart 13
Breakdown of revenues related to payment services (2021)



Hungarian payment service providers' revenues from card acquiring increased significantly as a result of the return of the growth in the payment card turnover to the pre-pandemic level, while smaller retailers' burdens as a proportion of turnover are still much heavier. Hungarian payment service providers' revenues from card acquiring, which represent costs on the retailers' side, significantly rose compared to 2020. The more than 22 per cent increase amounting to HUF 11 billion is primarily the result of the dynamic growth in turnover and the favourable impact of the Act on Trade on the expansion in the infrastructure. Most of the income with a total value of HUF 62 billion is still related to the merchant fees proportionate to the value of transactions. A favourable change is that in the

case of merchants whose quarterly card turnover is below HUF 1 million, the ratio of payment service providers' revenues from merchants to the card payment turnover of the merchants concerned declined from 2.9 per cent to 2.4 per cent. Nevertheless, this is still expressly high, especially compared to merchants with higher turnover. However, while the number of the smallest retailers increased on annual average by 38 per cent every quarter compared to the previous year, their turnover expanded by 59 per cent. (Chart 14)

Chart 14
Ratio of revenues compared to payment card purchase turnover by merchant categories according to quarterly payment card turnover

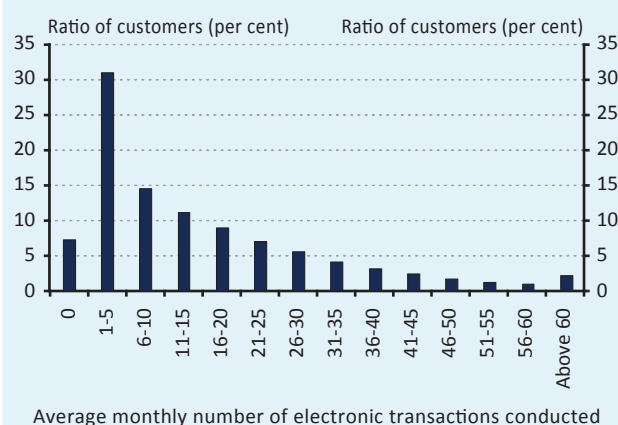


2.2.1 Pricing trends⁶

Already more than one third of customers may be considered active in terms of the transactions initiated in one month, but favourable pricing of credit transfers is indispensable for any further development. Changes in fee burdens affecting customers are of utmost importance in terms of the further development of electronic payments, because they are able to significantly influence transaction habits, and therefore the MNB is continuously analysing the trends observed in the sector. According to the data of the 2020 statements of fees sent to consumers, nearly 38 per cent of the customers that have a payment account conduct less than six electronic payment transactions (payment by card, credit transfer, direct debit) a month. At the same time, nearly as many customers, i.e. 36 per cent of them initiate more than 15 electronic payment transactions a month, corresponding to one transaction every second day, so these customers may be considered electronically active. (Chart 15)

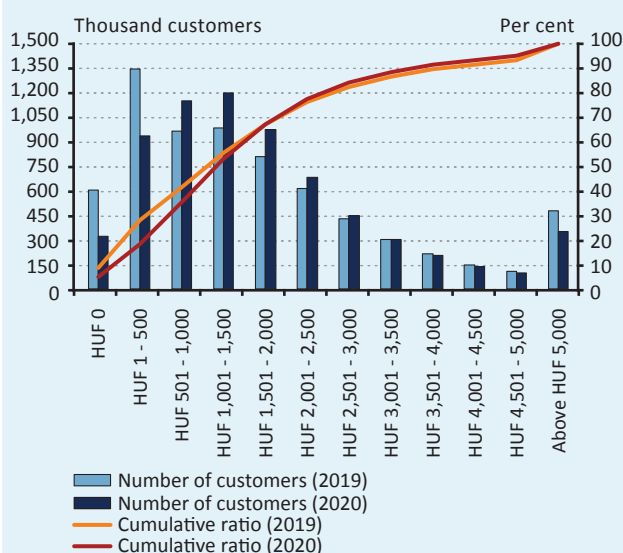
⁶ Due to reporting entities' amendments, the data presented in this chapter may be different from the ones in previous analyses.

Chart 15
Retail customers according to the frequency of using electronic transactions (2020)



Customers typically face high bank costs even if their electronic payment turnover is negligible. The launch of the instant payment system on 2 March 2020 and the innovative payment services relying upon it may greatly contribute to the further increase in the number of electronic transactions. It is important to note, however, that according to the MNB's surveys, the pricing of new services is also extremely important for customers, in addition to speed and security. At present, consumers pay high monthly fees, in spite of the low number of electronic transactions. In 2019, even with the low number of transactions, 60 per cent of customers paid more than HUF 1000 a month, and in 2020 this ratio grew to 65 per cent. Nevertheless, the number of customers whose average monthly cost reaches HUF 5000 – already corresponding to

Chart 16
Breakdown of customers by their average monthly payment costs



more than HUF 60 thousand a year – declined considerably, by nearly 100 thousand. Presumably, in view of the high costs these customers preferred to change account packages, in which the receipt of statements of fees may also play a role, as thus all the fees paid became available in an aggregate manner as well for customers. (Chart 16)

Already almost all major banks in Hungary offer account packages that contain a specific number of free credit transfers and unlimited number of free card payments, but still few customers use them. The spreading of new and innovative electronic payment methods, especially including end-user services based on instant payment, requires favourable, primarily package-based pricing of credit transfers that also comply with international best practices. Supporting electronic payments and the services relying upon the instant payment system, on several occasions the MNB expressed its expectations related to the introduction and the widest possible spreading of account packages applying package-based pricing. As a result of the MNB's 2020 executive circular, larger banks already offer account packages that apply package-based pricing, and all of them offer 'free' credit transfers (i.e. free of per-transaction fees) at least up to a certain amount or number of transactions. While extra costs would not arise on the customers' side in the case of account products relying upon package-based pricing even if the number of electronic transactions increased significantly, the fees paid may even multiply in the case of the products that are more widespread at present. The former may significantly contribute to the further spreading of electronic payments, but still few consumers use them, and thus it would be worth for customers to think over how much they would be able to save with these packages.

The MNB considers it a good practice to introduce account packages applying package-based pricing that allow the initiation of credit transfers up to a higher value of at least HUF 150 thousand a month without per-transaction fees, or where an unlimited number of low-value transactions below HUF 20 thousand is offered to customers. The adoption of modular account packages where customers may choose a package-priced module as well in line with their own payment habits is also considered good practice. At the same time, an important aspect here as well is to have modules that offer free credit transfers up to at least HUF 150 thousand a month or in the case of transaction amounts below HUF 20 thousand. It is important that the price of account packages that apply package-based pricing or of the package-priced modules should not exceed a couple hundred forints (even with a higher income expectation, corresponding at most to the average wage). The MNB is proposing to restructure, in line with conditions corresponding to good practices, those account packages where only the first some transactions are free of charge or

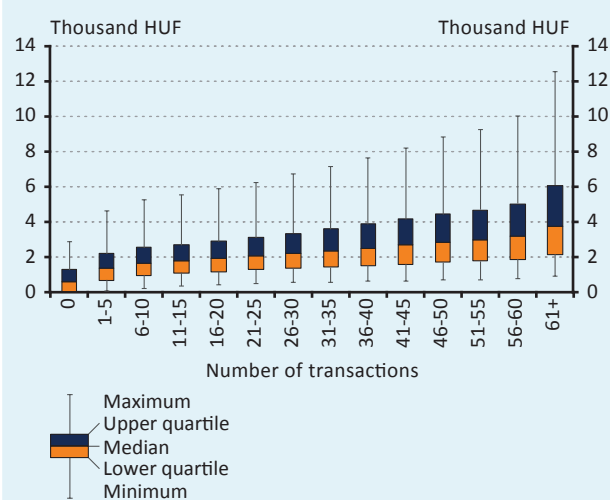
it is possible to initiate transactions without per-transaction fees only with low value and in a limited number or where the pricing is not sufficiently customer friendly (e.g. too high fees, too high income expectation). In addition, in the MNB's opinion it is considered bad practice if at the given bank it is not possible to choose a package-priced account package or module, or their price is extremely high or not customer friendly. It is also a bad practice if credit transfers have high minimum and value-based fees as well in the account packages, or if credit transfers below HUF 20 thousand also have a transaction fee.

It is crucial to create transparency and provide appropriate information, as already in the current pricing structure many customers would be able to reduce their payment costs by changing account packages. Our analyses suggest⁷ that for electronically active customers, i.e. around one third of the population (Chart 15), it would be worth to switch to an account package that applies package-based pricing, but opting for other schemes also allows the saving of significant costs. It is true for any of the groups according to the number of transactions conducted that there is at least one customer in them whose average monthly cost is ten times higher than

that of another customer belonging to the same group. Even taking the median of the groups as a base of comparison, in each group there is at least one customer whose cost is three times higher than the median value of the group. In the groups according to the number of transactions, the changing of bank accounts is worth considering for those customers who pay a fee that exceeds the median value (indicated with blue colour in Chart 18), as they may presumably have access to a much more favourable account package that is more in line with their payment habits. (Chart 17)

A broader changeover to package-based pricing would be favourable in terms of the strengthening of transparency as well, as in the current framework, in view of the significantly different cost structures, customers are often in a difficult situation in connection with the comparison even if they use the MNB's bank account selector programme or study the fee information document that must be prepared pursuant to the Payment Accounts Directive (PAD)⁸. A step forward is the statement of fees sent every year, which may help customers to find account packages with more favourable structures and to change accounts by using various account selection programmes. Nevertheless, the statement of fees is often difficult to access and/or interpret for customers. However, the MNB continuously examines the situation, and interferes if necessary for a positive change and for the provision of precise information. At the same time, it is important that banks share the prepared statements of fees at easily accessible places to allow customers to find them without difficulties. For them it is especially important to study these statements, because they contain information based on which it is possible to assess the size and structure of bank costs. And, as the case may be, they may also substantiate the making of the decision related to switching to another account product.

Chart 17
Distribution of customers' average monthly costs depending on the number of electronic transactions conducted



Note: Outliers have been excluded, and the minimum and maximum of average monthly costs in terms of the average monthly number of transactions in the chart indicate the 5 per cent and 95 per cent percentiles, respectively.

2.3 RELIABILITY OF ELECTRONIC PAYMENTS

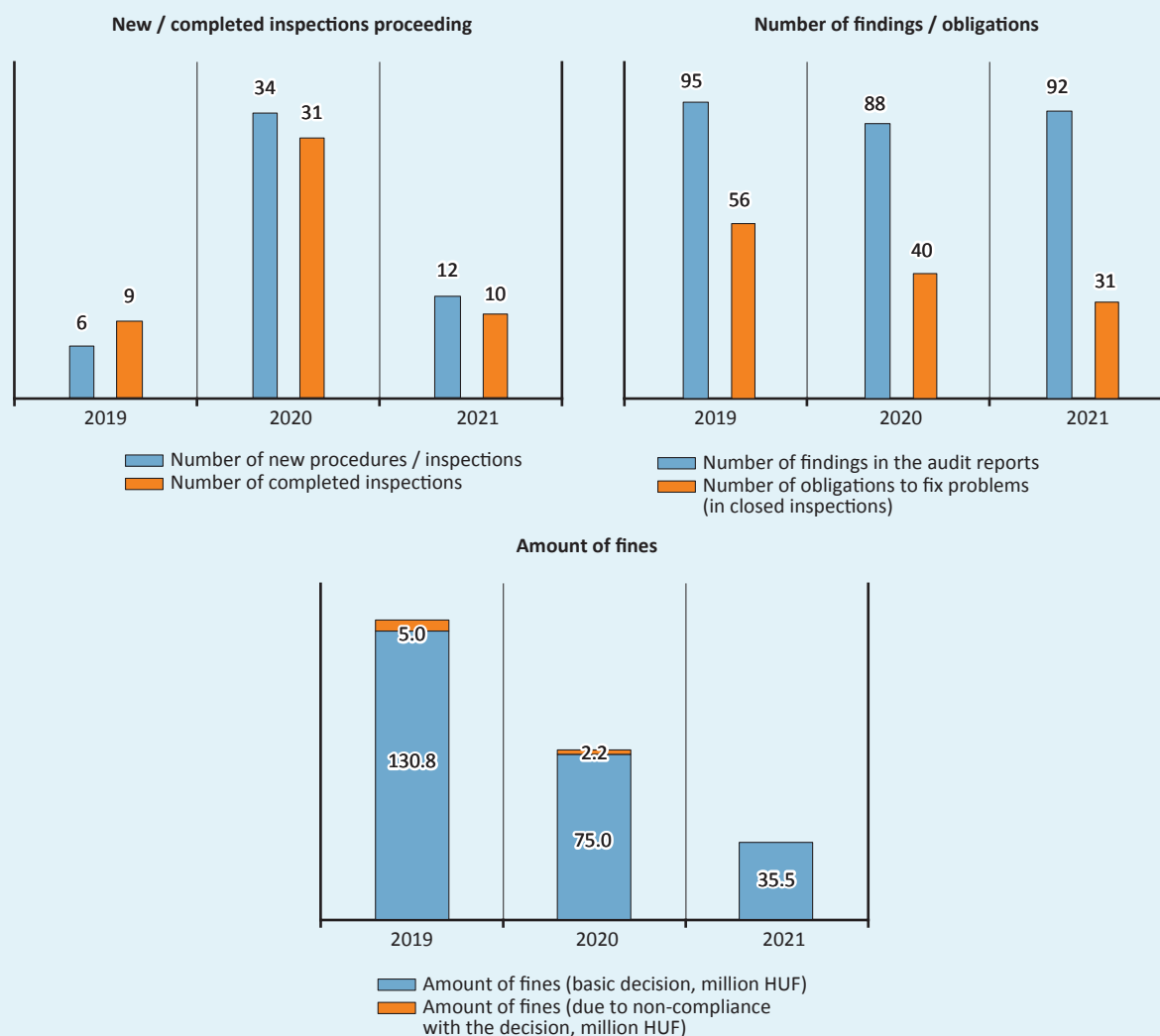
2.3.1 Compliance with the payment legislation

According to the payment inspections in 2021, the operation of the payment service providers under review was satisfactory in general. However, deficiencies were mostly found. In 2021, 12 payment inspection procedures

⁷ In 2021, the MNB prepared a comprehensive study about the payment habits of households. The findings of the study suggest that at present 20 per cent of the inhabitants that have electronic incomes belong to the group of the most active ones in terms of electronic transactions, and a further 40 per cent of them are in the group of those with average electronic activity. For some of the customers in the two groups it would presumably be worth to choose a package-priced account package. [OP 143. Vivien Deák-István Nemecskó-Tamás Végső: Payment Habits of the Hungarian Households in 2020 \(mnb.hu\)](#)

⁸ 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

Chart 18
Key data of the payment inspections conducted by the MNB*



Note: The data in the chart are for information only and may not be regarded as time series data reflecting statutory compliance, suitable for the analysis of trends. The number of findings related to the individual years significantly depends on e.g. number of payment inspections, while the average number of findings per inspection depends on the type of the inspected institution (the potential number of legal provisions that may be inspected in the respective proceeding).

**The chart presents the data of the results of the payment inspections taking into consideration the inspections carried over from previous year, where under the respective year the findings included in the inspections report sent out in the reporting year and the procedures completed in reporting year are shown, irrespective of the year of launching the inspection.*

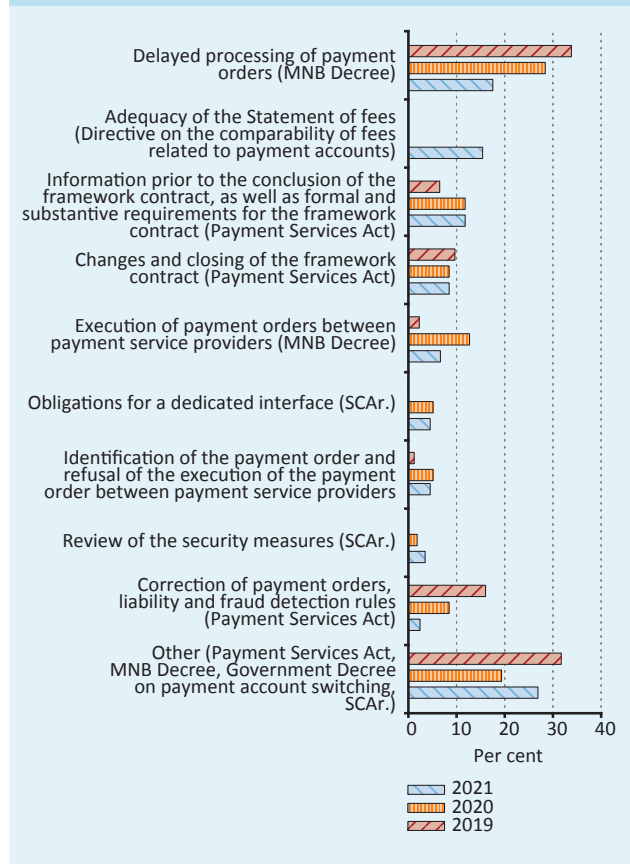
were launched, and 10 were closed. The inspection reports sent out during the year found 92 infringements, while the resolutions contained 31 measures and penalties amounting to a total HUF 35.5 million at 4 institutions. (Chart 18)

According to the findings of the payment inspections, the rules concerning the immediate crediting of the amounts of incoming payment transactions were the most often violated ones. In 2021, 17 per cent of the findings for the year under review were related to the provision concerning the immediate crediting of payment transactions of the

MNB Decree on the execution of payment transactions⁹ (MNB Decree). (Chart 19). As a consequence of this infringement, customers' chances to immediately dispose of the amounts they receive become prejudiced, which may result in a liquidity problem, or, for example, in the case of instant credit transfers, with the unjustified extension of the duration of the payment transaction from customer to customer the predictability of customers' payment turnover declines, which may compromise customers' trust in electronic payments. For the sake of transparent interpretation, in 2020 the MNB issued a recommendation

⁹ MNB Decree No 35/2017 (XII. 14.) on the Execution of payment transactions

Chart 19
Ratio of the main types of errors identified during the payment inspections



regarding the immediacy of crediting. For the time being it cannot be seen whether it was a result of this recommendation, but, in any case, improvement was observed in this regard compared to the previous year, as in 2020 the share of not immediate crediting within all infringements was still 28 per cent.

A new type of error and at the same time the second most frequent infringement was the violation of the rules regarding the preparation of the statement of fees related to consumer payment accounts. Incomplete statements of fees or the facts that the data they contained were not as detailed as required by the rules or did not contain important supplementary information accounted for 15 per cent of the infringements in 2021. The second chapter of the Payment Accounts Directive is a rule with the aim to allow the comparability of payment accounts kept for customers with various payment service providers¹⁰, which formulates provisions about giving preliminary information

(fee information) and subsequent information (statement of fees) to customers in a uniform structure and format. The decree entered into force in the summer of 2019, and thus the ex post information could first be verified in the procedures launched in 2020. According to experiences, service providers were unable to implement the rules of ex post information – the details of which are contained in an EU implementing regulation¹¹ – at an adequate level, as findings were formulated at every bank where the report containing findings of inspections was sent out in 2021 and this legislation was also verified.

The violation of the form and content requirements of the payments framework contract was identified as the third most frequent error, in connection with which the provision of information prior to concluding the framework contract was also violated. Of the findings explored in 2021 related to the violation of the Payment Services Act¹², the most important one was the violation of the provisions concerning the form and content requirements of the framework contract, as 12 per cent of the findings for the year under review were related to it (Chart 19). Accordingly, the provision of information prior to concluding the framework contract as well as the precise definition of the framework contract as provided by law were violated, mainly in connection with the correction of payment transactions as well as with laying down the liability and loss allocation rules in a framework contract. As a committed protector of consumer rights the MNB acts against payment service providers not only when it experiences an infringement related to the correction, reimbursement or refunding of payment transactions in practice, but also when it sees an additional requirement in the framework contract of payment service providers compared to the Payment Services Act pursuant to which payment service providers can reject customers' complaints concerning payment transactions beyond the possibility provided by the Payment Services Act. The MNB considers an infringement stemming from a framework contract that is not precise as serious violation of the law, as it is suitable for deceiving customers, including the consumers who are vulnerable in terms of enforcing their right and therefore are to be particularly protected, and suitable for impairing their rights and influencing their decisions in a disadvantageous manner. The MNB evaluates this deficiency especially strictly if the framework contract whose content violates the law affects a wide range of customers, i.e. has a potentially significant negative impact.

¹⁰ Government Decree No. 144/2018 (VIII. 13.) on certain issues related to the provision of information on fees for consumer payment accounts

¹¹ Commission Implementing Regulation (EU) 2018/33 of 28 September 2017 laying down implementing technical standards with regard to the standardised presentation format of the statement of fees and its common symbol according to Directive 2014/92/EU of the European Parliament and of the Council

¹² Act LXXXV of 2009 on the Provision of Payment Services

Last year, violations of the provisions of the regulation regarding strong customer authentication as well as common and secure open standards of communication¹³ doubled both in terms of their number and ratio. Most of the errors were related to the violation of the obligations and extraordinary measures regarding the application programming interface (API), to the review of security measures and the violation of general authentication requirements. The regulation formulates rules and technical requirements regarding strong customer authentication as well as common and secure open standards of communication that allow a major reduction of frauds and the increasing of security in the case of using electronic payment instruments as well as the provision of services by third-party providers (TPPs).

2.3.2 Frauds related to electronic payments

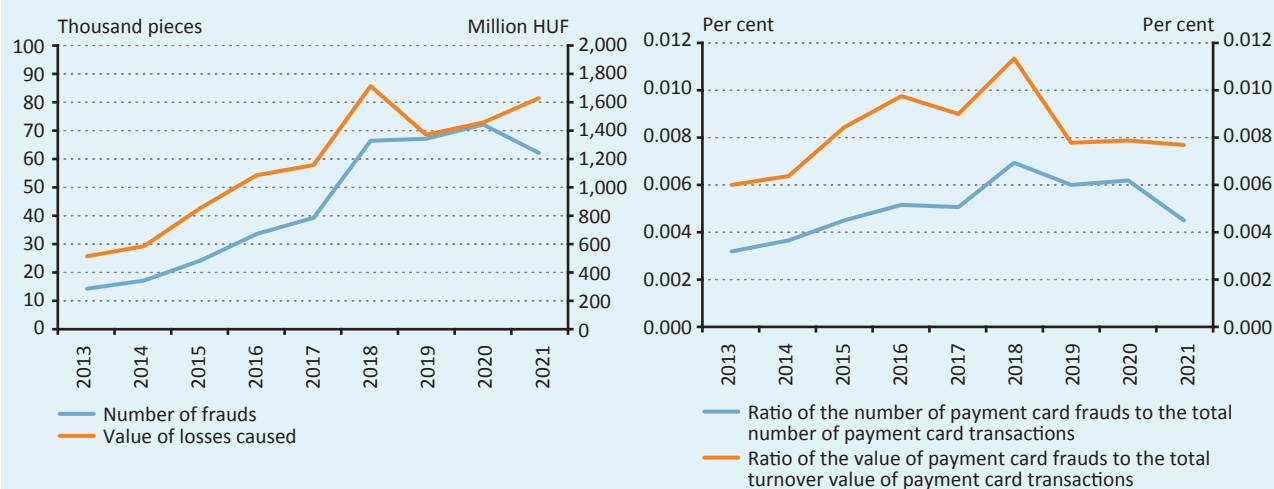
The ratio of frauds to turnover is still insignificant on the card issuer side, but due to fraudsters' quick adaptation, the wider application of strong customer authentication met the related expectations only partly. Although compared to the previous year the number of payment card frauds declined considerably, by nearly 15 per cent on the issuer side, their value was 12 per cent up. At the same time, the committed 62 thousand frauds and the related loss of HUF 1.6 billion caused did not even amount to 0.01 per cent of the card turnover in 2021, and as a result of the dynamic expansion in the turnover there is even some improvement compared to 2020. Nevertheless, strong customer authentication, which was extended to online transactions as well and in the case of transactions

conducted within the European Economic Area (EEA) can only be disregarded if the exemption rules set out in the legislation are complied with, met the related expectations only partly. While in the first half of the year positive trends prevailed in relation to the decline in card frauds as a result of the fact that they cannot be simply committed any longer in the online space only with the use of stolen cards and acquired card data, starting from 2021 Q3 both the number and value of successful frauds rose again due to the changes in the structure of the solutions applied by fraudsters. Although the number of frauds did not reach the level of 2020 H2 yet, their value exceeded it significantly, by nearly 37 per cent. (Chart 20)

Fraudsters shifted towards deception and psychological manipulation in connection with payment card frauds as well, and criminals also try to circumvent the obstacles created by strong customer authentication by conducting transactions outside the EEA using the card data obtained. Among the most frequent patterns it is observed that those acting in a fraudulent manner – typically pretending to be bank employees – simply ask customers to give out sensitive payment data through phone calls. Customers very often disclose even the confirmation codes sent in a text message. A bank clerk never requires this information, and this is one of the reasons why it is increasingly important to strengthen the role of customer education and financial awareness in the prevention of fraud. Therefore, it is a definite expectation of the MNB from banks as well that they should try to call consumers' attention to risks using simply worded, short messages presenting practical examples.

Chart 20

Changes in the number of frauds and in the related losses caused, as well as their ratio on the card issuing banks' side to the total payment card turnover



¹³ Commission Delegated Regulation (EU) 2018/389 of 27 November 2017 supplementing Directive (EU) 2015/2366 of the European Parliament and of the Council with regard to regulatory technical standards for strong customer authentication and common and secure open standards of communication

An unfavourable trend is that the volume of losses charged to customers is growing considerably in parallel with an increase in the role of deception and psychological manipulation. Compared to the previous year, in 2021 the amount of losses written off declined significantly on both the issuer and acquirer sides, but the value and ratio of losses charged to card holders increased considerably both nominally and within total losses as well. While the former increased by 104 per cent, the latter was 14 percentage points up. This is attributable to card issuing banks' argumentation that customers act with gross negligence during deception and psychological manipulation, as they disclose their sensitive payment data and the confirmation codes used for strong customer authentication to third persons, and thus banks are not liable for losses. In 2021,

customers had to incur losses amounting to a total value of HUF 465 million, which exceeds the previous year's figure by HUF 236 million. (Chart 21)

The unfavourable previous trend concerning successful frauds identified in electronic payments not related to payment cards continued, but their ratio in terms of both number and value is still negligible compared to the total credit transfer turnover. Although the value of successful frauds declined by nearly 8 per cent compared to the high value observed in 2020, their number increased by 131 per cent in 2021, i.e. more and more customers are affected by the problem. At the same time, the 2.5 thousand cases committed in a value of HUF 2.5 billion are still negligible compared to the total credit transfer turnover. Moreover, the ratio is still only one tenth of what is seen on the card issuer side. Nevertheless, in view of the rapid spread of deception and psychological manipulation, it is necessary to pay increasing attention to prevention in order to avoid further escalation of the negative developments, which requires the strengthening of customer education from banks as well. (Chart 22)

Chart 21
Losses written off in relation to payment card fraud on both the payment card issuer and acquirer sides

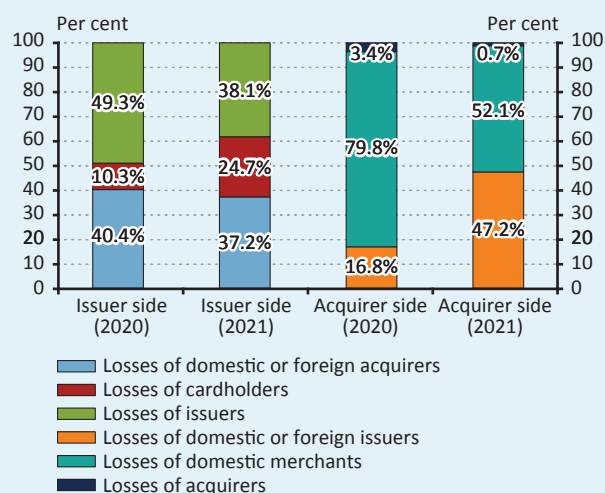
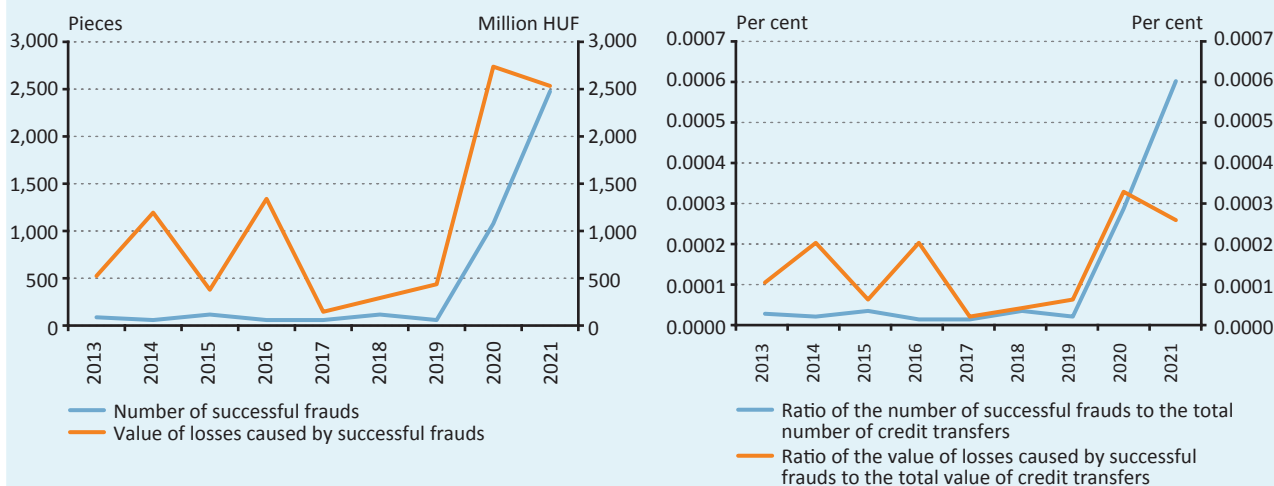


Chart 22
Changes in the number of electronic frauds not related to payment cards and the value of the losses caused, as well as their ratio to the total credit transfer turnover



Box**Central support to the fight against frauds**

According to both domestic and international experiences, electronic payments are exposed to a rising pressure from frauds, which increases the related risks. As a result of opportunities provided by technological development, fraudsters are increasingly targeting digital channels and electronic payment services in parallel with that, and during their attempts to misappropriate consumers' funds, they apply solutions that are increasingly sophisticated and difficult to identify. Therefore, it is absolutely necessary for payment service providers to apply transaction monitoring mechanisms and take customer education measures that are able to efficiently prevent frauds affecting electronic payments and to identify them if they occur, as well as to prevent successful execution in time, whether it is about acquiring personal authentication and sensitive payment data or unauthorised initiation of payment transactions based on that, or cases based on deception or psychological manipulation, which play an increasingly dominant role.

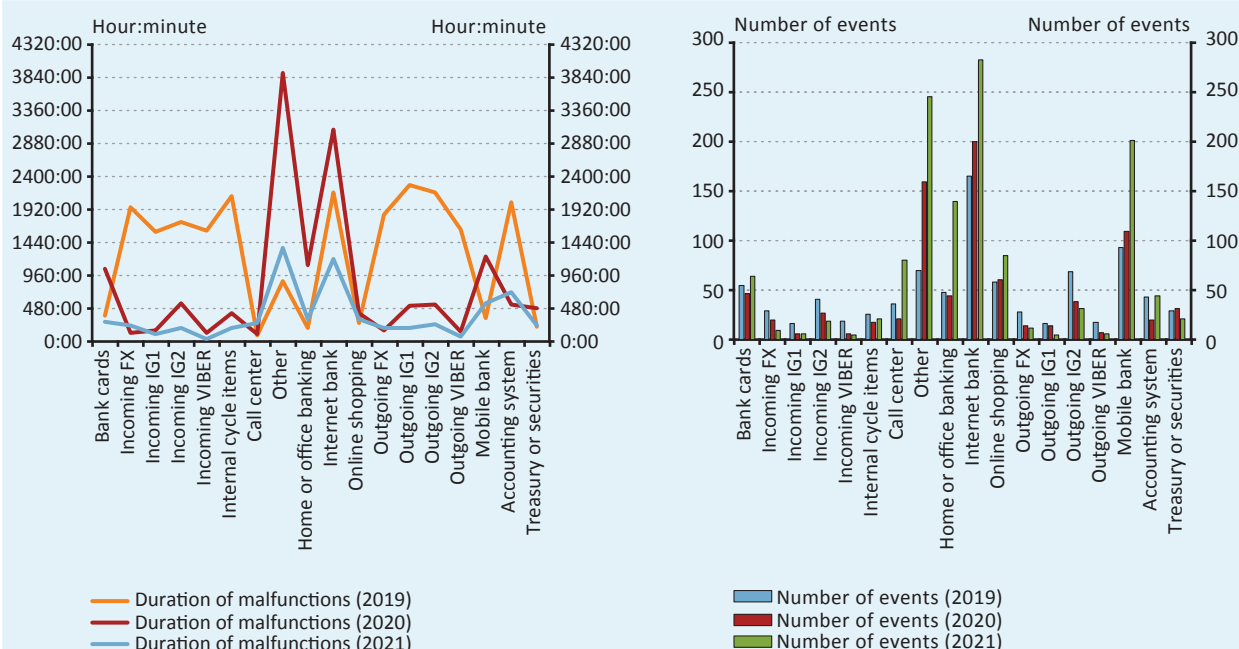
In order to facilitate the above, the MNB intends to provide support to domestic payment service providers. In connection with the detection, prevention and handling of frauds affecting payments, the primary objectives of the intervention are to summarise the MNB's expectations towards payment service providers, to support the related application of regulations as well as to promote the formulation of a uniform practice in the case of issues not regulated. Considering all that, the MNB intends to provide guidance regarding the expected protective measures and the ones proposed to be applied as good practice, so that all domestic payment service providers could take appropriate steps in relation to curbing the frauds that affect electronic payments.

In addition to the above, together with GIRO, which operates the Interbank Clearing System (ICS), the MNB is also examining the possibilities of setting up a central money laundering and fraud monitoring system as well as an interbank platform for sharing fraud related information. While the former aims at the earliest possible identification of fraud patterns and networks on the basis of data available at GIRO as well as at the support of banks' monitoring systems with sector-level data, the objective of the latter is to achieve efficient sharing of information among banks, which would allow a rapid and efficient sharing of risks identified by individual institutions with all the actors in the sector.

2.3.3 Payment incidents at payment service providers

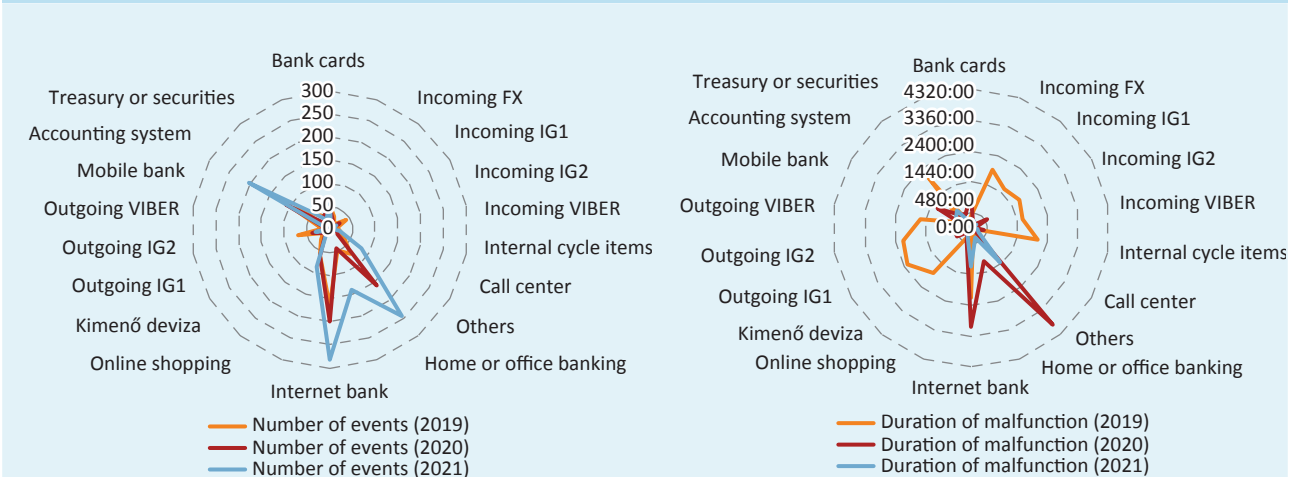
Incidents related to payment services declined significantly in connection with the central processes (ICS, VIBER), whereas the number of incidents increased in the case of electronic payment channels (mobile bank, Internet bank, processing of instant payments, online shopping) in 2021. It is a major change compared to the previous year that the number of incidents reported by credit institutions rose by 52 per cent compared to 2020. The MNB received information on 746 incidents of 26 credit institutions in total. (Chart 23). However, the average duration measured

from the occurrence of the incidents until their resumption during the year was 5 hours 11 minutes, which is more than 13 hours shorter than the one measured in 2020. The time between the occurrence and detection of incidents also shows a much more favourable picture; the previous 11 and a half hours was down to 1 hour 37 minutes by 2021. It is also favourable that the number of incidents exceeding 100 hours was only 2. At the same time, while previously denial-of-service attacks had constituted the reported reason for one incident a year, in 2021 already 19 incidents were attributable to DoS attacks. Nevertheless, the average duration of the incidents was a mere 81 minutes, and only one of them exceeded six hours.

Chart 23**Number (right-hand chart) and duration (left-hand chart) of payment service providers' malfunctions**

Following the introduction of the instant payment system, the rearrangement observed in the case of incidents continued in 2021 as well. The number of incidents reported in connection with interbank forint and foreign currency transfers continued to decline in the central payment service processes, which is generally true for ICS and VIBER items as well as for foreign currency transactions. Many of the errors of the central payment processes were caused by various communications failures, which is in line with the fact that the adequate functioning of business processes related to payment cards and ATMs requires the coordinated activity of various actors that are independent of one another (e.g. card companies, retailers, credit

institutions, telecommunication companies). Against this background, the incidents affecting electronic banking channels accounted for more than 60 per cent of the total number of incidents. The number of incidents related to Internet banking, home or office banking, mobile banking, online shopping or call centres was 462, representing a more than 60 per cent increase compared to 2020. These incidents hindered customers mostly in the initiation of credit transfers, in account history query as well as in using other mobile banking services. Most of the reported errors were related to operations and maintenance not performed properly. (Chart 24).

Chart 24**Number and duration of payment service providers' malfunctions, and changes in distribution by activity**

Although the number of incidents affecting the instant payment system and appearing as new elements in 2020 doubled by 2021, the effect of the previous incomplete year as well as the fact that the 62 cases still do not mean an outlier need to be taken into account. Moreover, a significant portion (more than one third) of the reporting

related to the instant payment was not in connection with any error; payment service providers stopped the related service due to maintenance. In addition, database problems, defects of applications and communication related incidents were the typical sources of errors.

Box

Interpretation of bank holidays in relation to the provision of payment services

One of the main objectives of the MNB is to support digitalisation and encourage the implementation of digital transformation. The implementation of digitalisation efforts is facilitated, inter alia, by the launching of the instant payment service, the widening use of payment cards as well as the continuous availability of a number of other banking services in online form (e.g. Internet banking and mobile banking services, online account opening, online credit application). As a result of the MNB's expectations, banks will probably implement further development projects for digital transition, and thus more and more banking services will become available outside normal banking hours, i.e. at night and on non-working days. In view of the digitalisation efforts, needs for the adoption of new banking IT systems or for the replacement and maintenance of previous ones may arise more often in the future, which may entail temporary discontinuance of the related services. These change-overs often take place at weekends (outside banking hours that were normal previously), and thus, taking account of the continuously available services, it may be necessary to use bank holidays outside normal banking hours as well.

The rules concerning bank holidays are included in Section 286 of the Credit Institutions Act¹⁴, but, considering the above, they have become obsolete by now, and they have not adequately served the needs of the changed environment surrounded by digitalisation processes. Therefore, the MNB considered it necessary to revise the regulation regarding bank holidays. Accordingly, as of 1 July 2022 the provisions of the Credit Institutions Act concerning bank holidays will be amended as follows:

- any planned downtime for a short period held on a working day by a credit institution (in the case of continuously provided services the weekend is also considered as working day), can only be implemented within the framework of a bank holiday;
- a credit institution has to include the conditions of the bank holiday in its general terms and conditions;
- a credit institution has to let the customers and the MNB know about holding a bank holiday at least 30 days in advance;
- in the event that the credit institution plans to hold 4 consecutive days as bank holiday, it is obliged to notify the MNB at least 60 days earlier;
- the MNB is still entitled to order a bank holiday as an exceptional measure.

Regarding the amendment to the rules of bank holidays, on 5 October 2021 the MNB addressed an executive circular to credit institutions, formulating its expectations related to the application of the new rules.

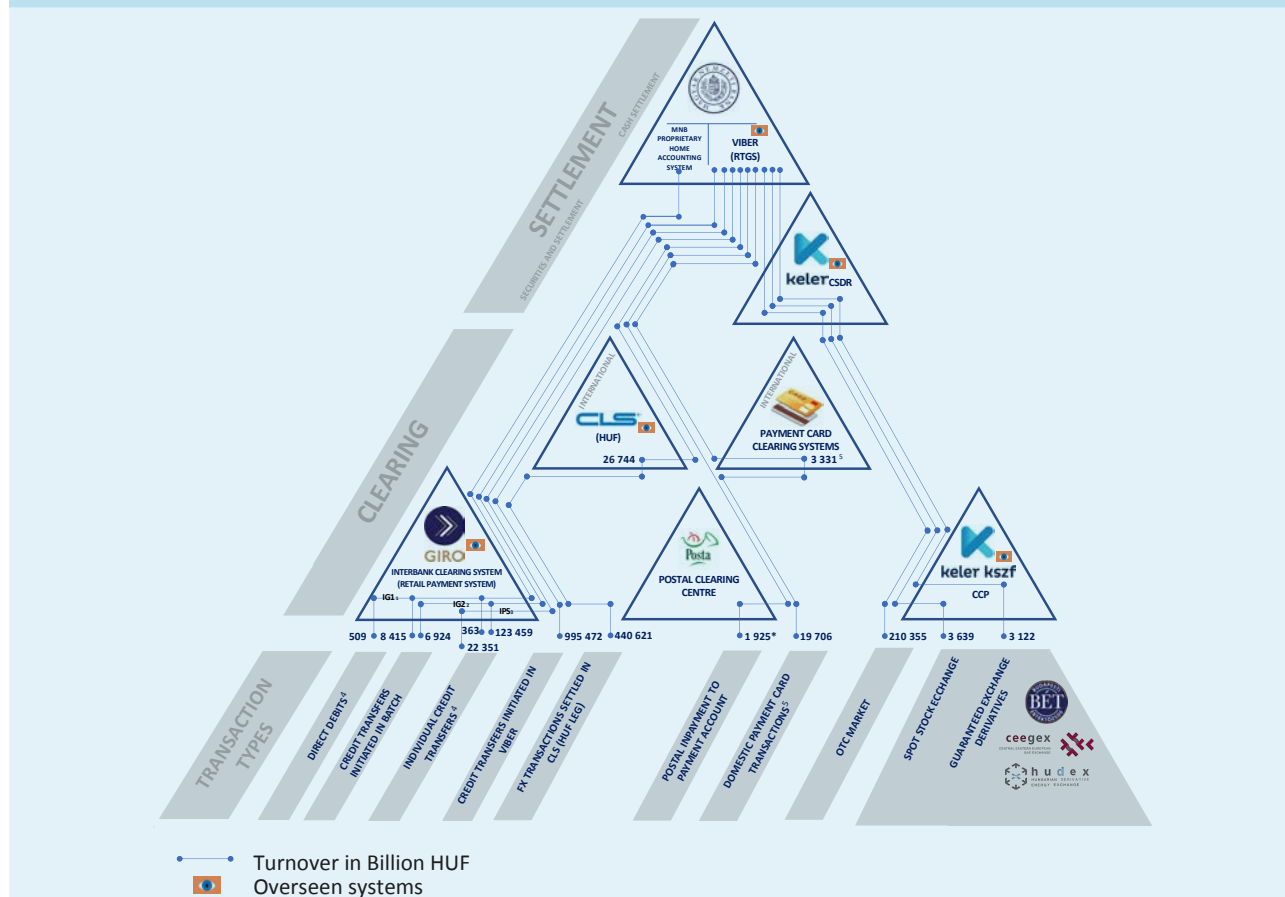
¹⁴ Act CCXXXVII of 2013 on Credit Institutions and Financial Enterprises

3 Financial market infrastructures

Smooth execution of the reliable, efficient operation of financial market infrastructures are essential for the execution of real economic and financial transactions. Payments in central bank or commercial bank money and transactions performed with securities and other financial instruments require centralised systems that allow for the clearing and settlement of transactions. VIBER is a real-time gross settlement system operated by the MNB. Its primary purpose is the settlement of large value, money and capital market transactions between participants and on behalf of their customers and the settlement of transactions cleared by related financial market infrastructures (ICS, KELER Group, CLS). The Interbank Clearing System (ICS) is a gross payment system mainly for the clearing of households' and

companies' low-amount payments operated by GIRO Zrt. (GIRO), offering three clearing methods: instant, intraday and overnight clearing. The clearing of card transactions is performed in the systems of international card companies (Visa, MasterCard), while postal payment instruments are typically cleared in the Postal Clearing Centre (PCC). Members of the KELER Group, i.e. the central securities depository (KELER CSD) and the central counterparty (KELER CCP), are responsible for securities clearing and settlement services, and the registration of domestically issued securities. CLS is an international FX settlement system operated by CLS Bank. It is based on a multi-currency payment-versus-payment (PvP) mechanism and eliminates FX settlement risks. (Chart 25)

Chart 25
Overview of Hungarian financial market infrastructures (2021)



¹ Transactions settled in the overnight clearing

² Transactions settled in the intraday clearing

³ Transactions settled in the instant clearing

⁴ On-us transactions are not included

⁵ Only the interbank part of total payment card transactions is cleared in the payment card clearing systems

* <https://www.posta.hu/static/internet/download/Eves-Jelentes-2020.pdf> (posta.hu)

PAYMENT SYSTEMS

3.1 VIBER

Data sheet

Chart 26
Number and value of transactions settled in VIBER

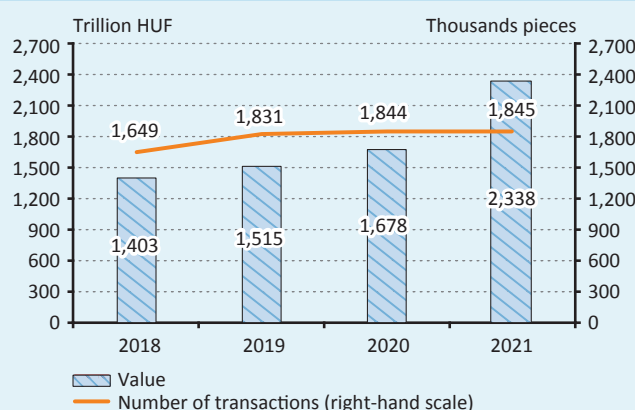
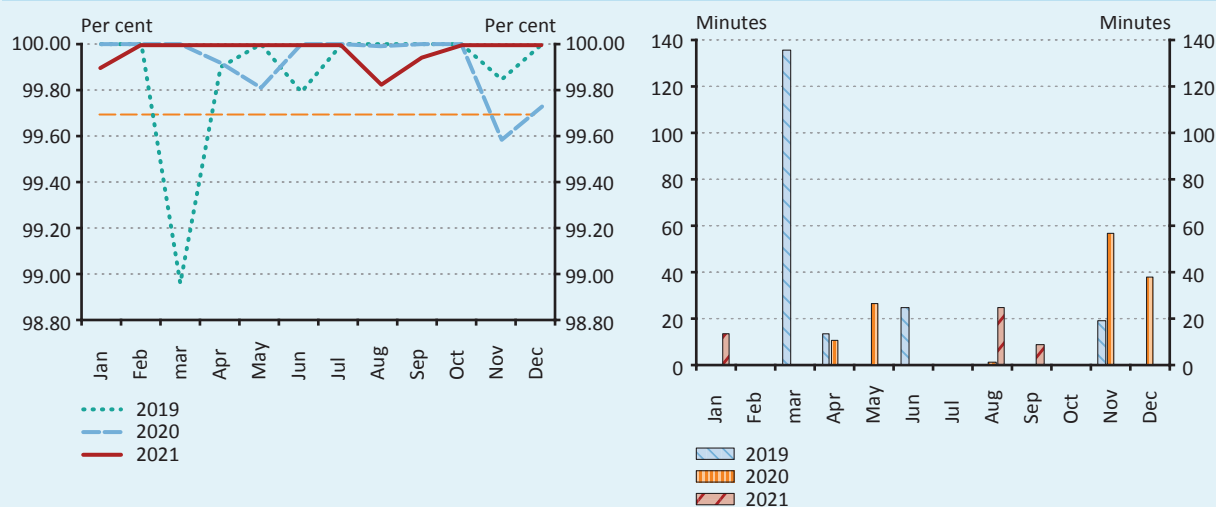


Chart 27
Monthly availability ratio of the VIBER (left-hand chart), and aggregate duration of outages of the core settlement services (right-hand chart)



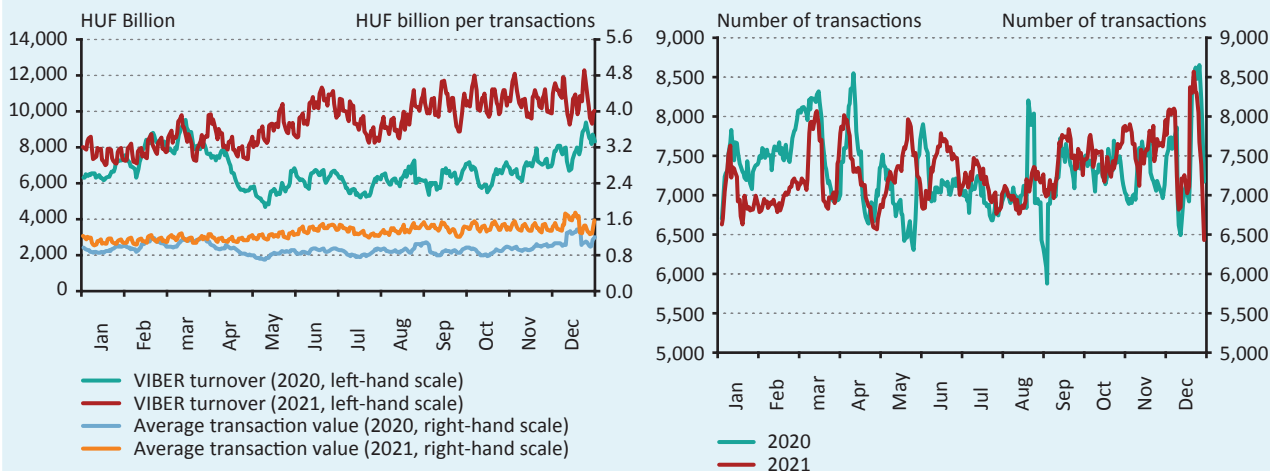
3.1.1 Current events

In 2021, the value of VIBER turnover increased by 26 per cent, while the number of transactions remained practically unchanged compared to the previous year. In 2021, the turnover surpassed the previous year's record, and its value exceeded HUF 2300 thousand billion, which proved to be the highest annual turnover in the past decade. Meanwhile, the number of transactions in VIBER stagnated around the level of 1.8 million. (Chart 26) Compared to the previous year, the value of the turnover increased considerably as of

May, when the average transaction value was realised in a band that was HUF 2–4 billion higher than in the previous year. (Chart 28, left side) Market volatility, which increased as a result of the coronavirus pandemic, is still perceived in the turnover. The rise in value is mainly attributable to the liquidity movements related to the ICS instant clearing, the cash leg settlement of securities transactions as well as other central bank transactions. As a result of the dynamic rise in the value and the stagnation in the number of items of the turnover, the average transaction value in VIBER increased by HUF 357 million in a year. (Chart 28)

Chart 28

Changes in the value and average transaction value of the VIBER turnover (left-hand chart) and number of transactions (right-hand chart) in an annual comparison



Box

Support to new entrants in VIBER

The MNB supports financial innovation, therefore connecting to VIBER as a direct participant is available to a wide range of institutions. This has created a new situation mainly for non-bank payment service providers, whose role has become increasingly important in recent years, and more and more of whom opt for direct VIBER membership. At the same time, the increased number of applications to connect urged the MNB to review the onboarding process and its related communication to allow this innovative segment to have smooth access to VIBER on the basis of adequate information.

The new procedure of connecting directly to VIBER entered into force with the 1 March 2022 version of the VIBER Business Conditions, in parallel with which the MNB also prepared some related information material, the so-called VIBER brochure. The purpose of the latter is to allow the institutions planning to connect directly to VIBER to assess what other Hungarian infrastructures it would be worth for them to join in parallel with VIBER, and to make the schedule clear for them. Accordingly, as of 1 March 2022 it is possible to join VIBER within the framework of a more structured and transparent procedure, which can thus be better planned as well. The new procedure of joining consists of four phases. (Chart 29) An institution may enter the next phase only after entirely accomplishing the current phase.

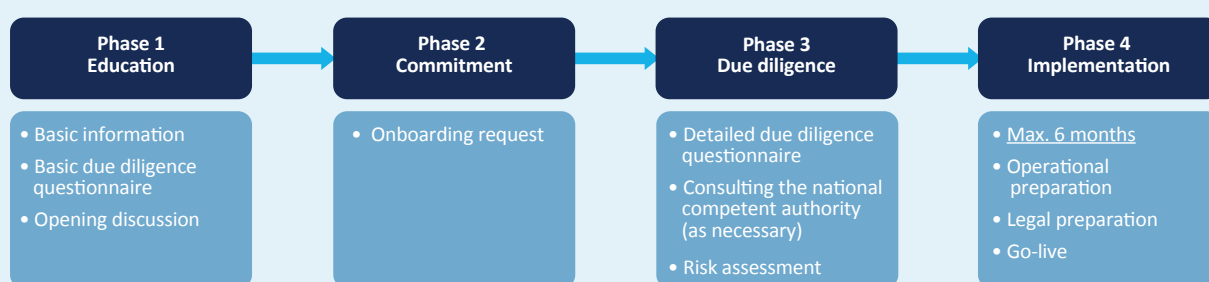
- I. The first phase is *education*, during which the MNB provides information on VIBER, on the conditions of direct participation and the onboarding process, and expects information from the institution regarding its activity planned to be pursued in Hungary. The latter also allows the MNB to start the institution's due diligence in respect of its compliance. In addition, an opening discussion takes place in this phase in order to clarify remaining issues and to establish smooth professional cooperation.
- II. The second phase is *commitment*, during which the institution forwards a formal application to join to the MNB.
- III. The third phase is *due diligence*, during which the MNB carries out complete screening and risk analysis in connection with the institution, which potentially includes contacting the national supervisory authority of the foreign applicant as well.
- IV. The fourth phase is *implementation*, during which the connecting institution – following the MNB's guidance – prepares for live operation. This includes operational and IT preparations as well as the concluding of the necessary contracts. The period of implementation is maximum 6 months as determined by the MNB, which

– according to experience – is abundantly sufficient for meeting the conditions. In addition, the MNB reserves the right to extend the 6-month deadline on an equitable basis. If the implementation does not succeed by the deadline specified by the MNB, a grace period shall commence, during which the institution may not restart the process. The grace period is 3 months. The purpose of this period is for both the MNB and the institution to review the reasons why onboarding failed. When the grace period expires, the onboarding process may be restarted from the commitment phase, which requires the submitting of a new application to join.

The MNB is committed to the successful onboarding of those who aim at direct VIBER participation, and expects similar commitment from the institutions that undertake the onboarding process. According to the MNB's expectations, the changes that entered into effect as of 1 March 2022 will make the procedure of establishing VIBER participation more efficient, improving the competitiveness of the Hungarian payments market.

Chart 29

Process of joining VIBER as a direct participant from 1 March 2022



3.1.2 Risks

In 2021, VIBER operated with high reliability, service continuity risk continued to decline compared to the previous year as a result of the shortening of the incident time of complete service outages¹⁵, and the remote operation introduced in view of the pandemic also did not cause further problems in the service. The operation of VIBER was stable during the whole year, and VIBER participants faced short-time complete service outages lasting 45 minutes in total only on 3 days. VIBER availability ratio fell to below 100 per cent in 3 months, of which – unlike in previous years – it reached the 99.7 per cent stipulated as an overseer's expectation in each month. It is positive that the aggregate incident time of complete outages declined by 65 per cent compared to the previous year. The incident time of complete outages was shorter than a quarter of an hour in two cases, and the longest outage lasted for 24 minutes. Half of the incident time of complete service outages was caused by telecommunication problem. In addition to that, operational and software as well as hardware faults occurred. During the year, no extension of interbank operating hours due to incidents affecting VIBER took place upon the MNB's request. The pandemic situation still did not allow the return of all VIBER

system operators to their offices from working at home or at shared sites, but it still did not result in any operational problem. (Chart 27)

Clearing and settlement risk remained low in VIBER in 2021.¹⁶ Due to the potential pass-through of the liquidity effect to other participants, which may increase the clearing and settlement risk in the system, it is essential to monitor the incidents related to VIBER participants. Namely, when there is an incident, the affected participant cannot send transaction to others and thus the funding effect of incoming items may decrease at those. The clearing and settlement risk caused by participants increased slightly in 2021, as the number of participant incidents related to VIBER almost doubled compared to the previous year. In 2021, 9 participants reported problems on 26 occasions, but workaround solutions were needed only in 3 occasions, when payment orders were submitted through GIROHáló instead of SWIFT. 35 per cent of the participant incidents were caused by SWIFT issues, while in the rest of the cases technical problems occurred in the participants' internal systems. In 2021, 60-minute extensions of operating hours upon participants' requests occurred on 14 occasions in VIBER.

¹⁵ complete service outage: an incident that took place at the MNB reduces VIBER availability

¹⁶ For the detailed analysis related to liquidity management see the section entitled 3.3 Liquidity in the payment systems.

3.2 ICS

Data sheet

Chart 30
Number and value of transactions cleared in ICS

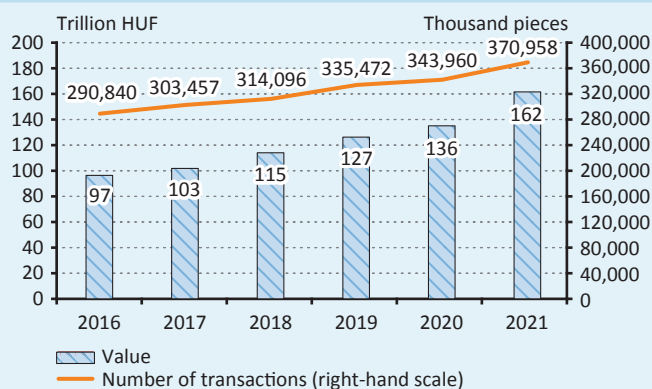
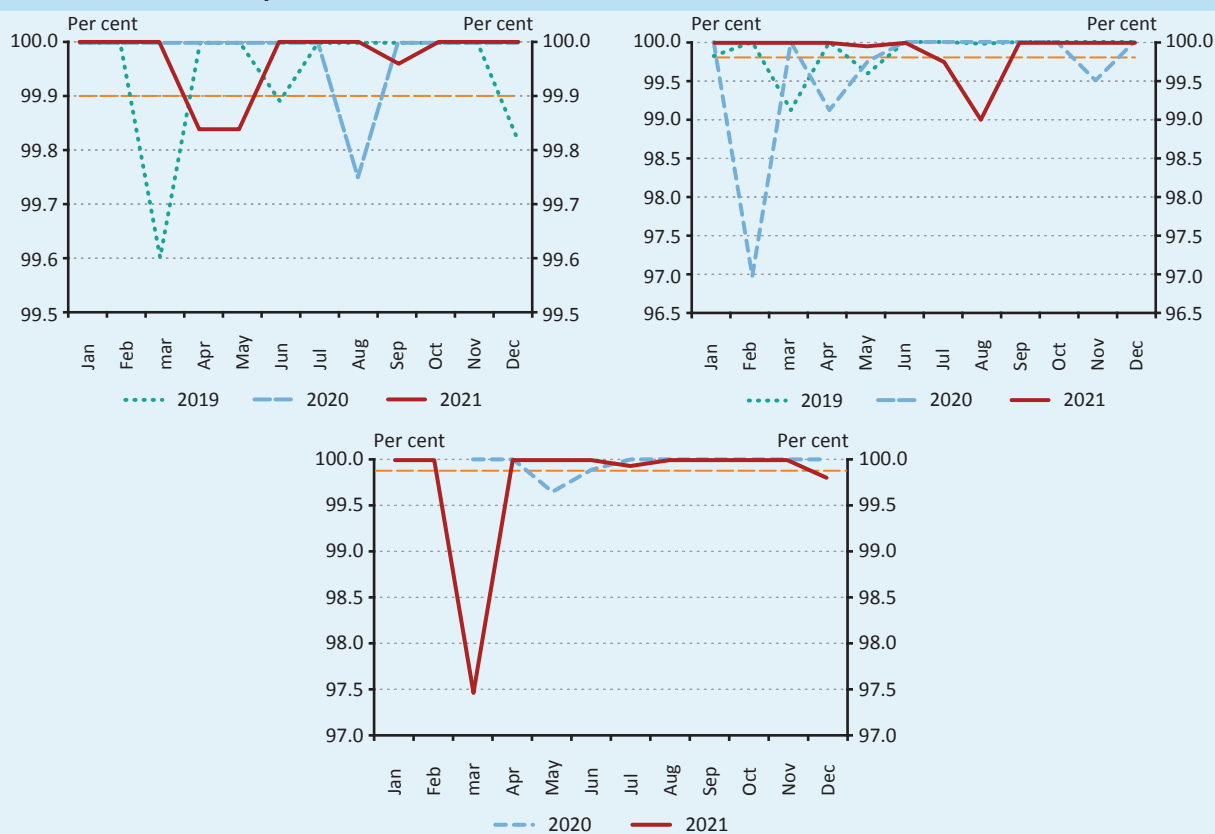


Chart 31
Impact of overnight (left-hand chart), intraday (right-hand chart) and instant (bottom chart) clearing incidents on availability



3.2.1 Current events

The ICS reached its turnover, which increased considerably compared to the previous years, efficiently and safely in 2021 as well. The value of the total turnover on the three platforms of ICS increased by 19 per cent, while the number of transactions was 8 per cent up compared to the previous year. New records were born in both the number of items and value of the aggregate turnover of the three overseen platforms. In terms of value, with an increase of 19.3 per cent the total turnover exceeded HUF 162 thousand billion, whereas the number of items was 7.8 per cent up, exceeding 370 million transactions (Chart 30). It is interesting that while 45 per cent of the number of transactions of the ICS turnover had taken place in intraday clearing in 2020, in 2021 already only 37 per cent of the transactions were processed here as a result of the redirection towards instant payment. Nevertheless, in terms of value, a major portion (80 per cent) of the ICS turnover was executed in intraday clearing, 14 per cent in instant clearing and 6 per cent in overnight clearing. (Chart 32)

The package of services of the ICS was complemented with a service that allows the submitting of batched requests to pay. As part of the clearing system, with the introduction of the GIROFix service, GIRO provides an alternative submission channel as well to ICS participants and also to other market players, which allows the submitting of batched requests to pay that are not time-critical. The option of addressing with a secondary identifier is also available for every customer within the framework of the GIROFix service.

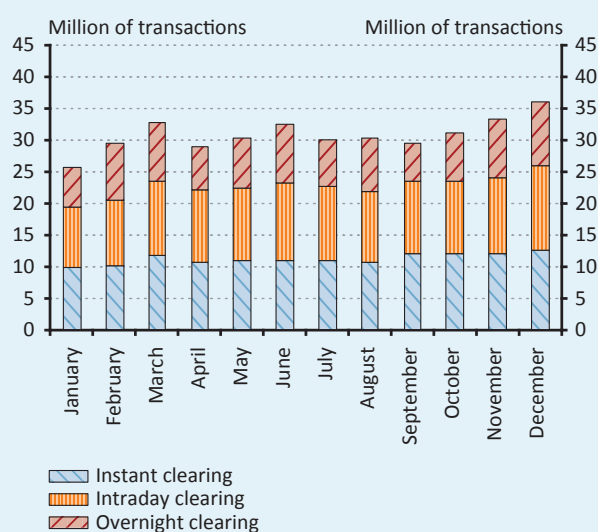
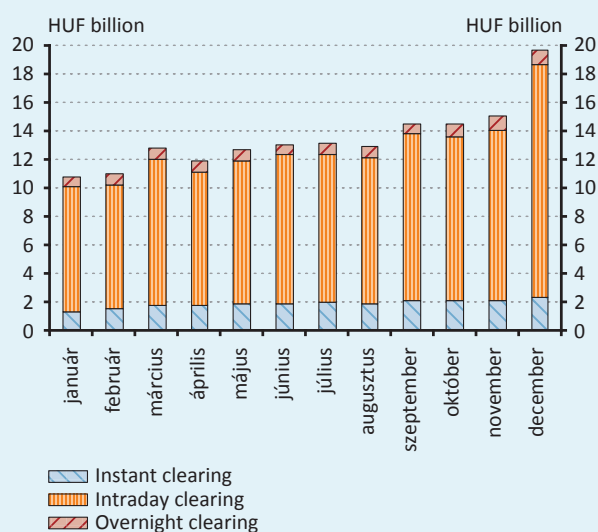
3.2.2 Risks

In 2021, all the three clearing platforms of the ICS operated with high reliability and safety. GIRO launched the central infrastructure of instant clearing on 1 July 2019, which is working reliably. The instant clearing platform of the ICS worked reliably in 2021 as well; most of customers' instant credit transfers were received by the beneficiaries well within the 5-second time-limit (typically in 1–2 seconds). The system operates continuously, without stopping, and ICS participants experienced below 99.9 per cent availability, which is undertaken by GIRO in the general terms and business conditions, only in two months. One occasion was in connection with the preparation of transaction-level reports related to the service, whereas in the other case a bank's collateral management process was concerned. The clearing of transactions was undisturbed during these events as well.

The ICS intraday clearing works in a stable manner; there were only 5 incidents in 2021. Out of them, on three occasions the results of a clearing cycle were sent out with a minimum delay. In the other two cases the InterGIRO2 Monitor was unavailable for 31 and 128 minutes, respectively, while the clearing cycles were carried out without interruption. As a result of the incidents, the availability ratio of the intraday clearing of ICS fell to below the 99.8 per cent, which is stipulated as an overseer's expectation, in 2 months. Service continuity risk decreased compared to the previous year (Chart 31, right-hand chart).

The ICS overnight clearing operated with high availability in 2021 as well. There were three operational incidents

Chart 32
Breakdown of the turnover on the ICS platforms



during the year; in the case of two the undertaken monthly level of availability was violated only to a minimum degree. During the incidents, in two cases there were delays of 33 and 10 minutes in opening the period for submittal, and on one occasion there was a 33-minute delay in producing the closing report. The incidents were attributable to the malfunctioning of the software of overnight clearing and a mistake made by an administrator. 100 per cent of the

transactions were processed, but in one case a bank had to resend the batches.

system operator shall specify in detail in its GTC the physical and logical security measures to be implemented by the cooperating parties, by participants in particular, to protect endpoints and the payment system itself.

Box

New MNB decrees concerning system operators of payment systems

The MNB announced MNB Decree No 34/2021 (IX. 15.) on the requirements regarding the general terms and conditions and specific regulations for organisations operating the payment system and MNB Decree No 33/2021 (IX. 15.) on the detailed requirements of operating the payment system in September 2021. The decrees entered into force as of 1 March 2022, allowing appropriate preparatory period to the system operators to manage their implementation tasks. The new decrees replaced ones that had been in effect since 2009 and whose amendment was made necessary by changes in oversight expectations, primarily the publication of the regulation of the European Central Bank (ECB) on oversight requirements for payment systems,¹⁷ as well as by findings obtained on the basis of comprehensive oversight assessments and continuous risk-based monitoring. The new MNB decrees apply to the MNB and GIRO as the system operators of VIBER and the ICS, respectively.

The requirements regarding the content of the general terms and conditions, the fee regulations and rules for managing the contingency situations changed slightly. One of the important changes that system operator shall specify in detail in its general terms and conditions the physical and logical security measures to be implemented by the cooperating parties, by participants in particular, to protect endpoints¹⁸ and the payment system itself

The MNB decree regarding the activity of system operators changed to a greater degree. The general terms of the operation of the payment system contain, inter alia, the requirements concerning the efficient governance arrangements and the adequate operation of the three lines of defence (risk management, compliance and internal audit functions). New requirements apply to the management of credit, liquidity, general business, custodian, and investment risks, for which the system operator shall maintain an adequate, comprehensive risk management framework in order to continuously monitor and manage the risks arising and borne in the payment system. The requirements concerning the independence and responsibility of the physical and logical security functions were expanded to strengthen the secure operation of the payment system. In connection with the management of the cyber risks, system operators are required to set up an efficient cyber security framework. In addition to business continuity, disaster recovery requirements have also been determined for a rapid recovery and restarting of the payment system, which allows a reduction of the duration of the interruption of the service. Accordingly, if the payment system applies continuous clearing and settlement, such as the instant clearing of ICS and the VIBER, the requirement of restarting the operation following the occurrence of the contingency event became stricter, declining from 3 hours to within 2 hours.

As positive effects of the new MNB decrees, overseers expect more secure and more efficient operation of VIBER and the ICS as well as an increase in their resilience to the risks arising in the systems. The new and amended requirements may also strengthen the confidence in payment systems and payments, as well as may contribute to financial stability, since VIBER and the ICS play a crucial role in the settlement of money and capital market transactions as well as business and retail payments.

¹⁷ Regulation of the EUROPEAN CENTRAL BANK (EU) No 795/2014 of 3 July 2014 on oversight requirements for systemically important payment systems (ECB/2014/28)

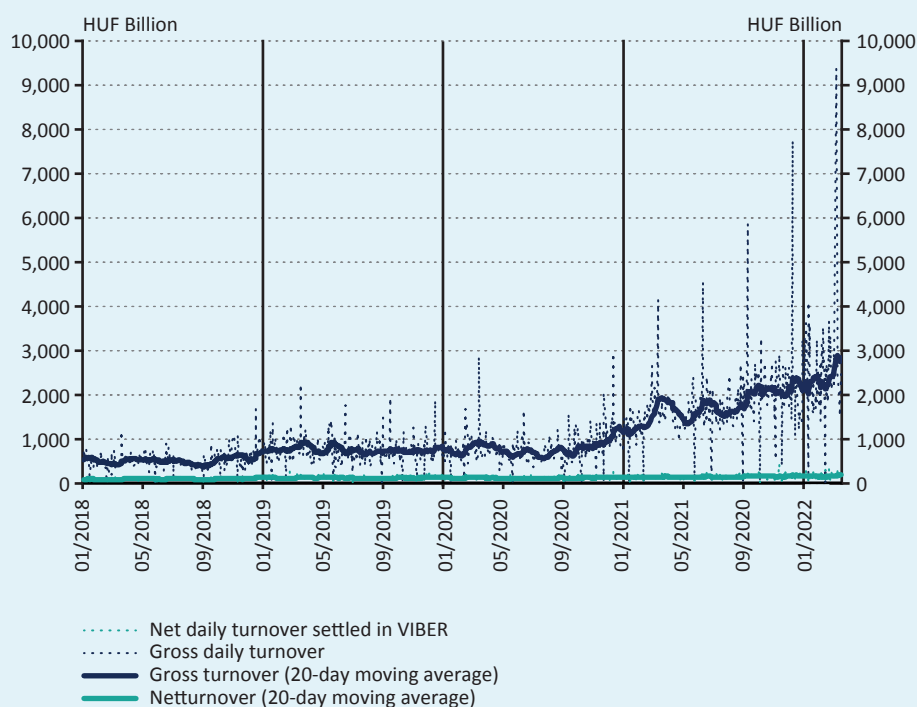
¹⁸ Endpoint means a point in place and time at which transfer order information is exchanged between two cooperating parties in the payment system, such as between a participant and a messaging network, the payment system and its participant, or the payment system and the messaging network.

3.3 CLS

Data sheet

Chart 33

Daily gross forint turnover settled in the CLS system and related daily net forint turnover settled in VIBER



3.3.1 Current events

In 2021, forint turnover in CLS more than doubled, achieving a total growth of 124 per cent, thereby further increasing the international weight and role of the forint.

While in 2020 the total volume of forint transactions carried out in CLS – a system established for the settlement of interbank foreign exchange transactions – amounted to HUF 196,000 billion, in 2021 it was HUF 440,000 billion. This, broken down into working days, represents an average daily value of HUF 779 billion and HUF 1,748 billion, respectively, in the past two years. The activity of the 5 new members that joined CLS forint settlement in 2020 greatly contributed to the growth, but those entities who joined earlier also use the service offered by CLS to a greater extent. The number of participants that joined CLS forint settlement remained at 31, while the number of the CLS system's members was 74 at the end of the year. Looking ahead, further growth may be expected in the CLS forint turnover. In the first two

months of 2022 the growth rate of turnover was as high as 87 per cent. (Chart 33)

3.3.2 Risks

Despite the pandemic, the growth in CLS turnover took place under stable operational security. CLS rendered its service with 100 per cent availability throughout the year. The 5 Hungarian banks that keep nostro account in Hungary and provide forint liquidity for the settlement of transactions experienced late payment only on 2 days during the morning processes of the 253 settlement days of the year. Apart from this, payment was submitted to VIBER by the deadline using a workaround solution compared to normal operation only on 1 occasion. The procedures of the nostro banks and of the MNB performed well also in 2021, and no VIBER incident hindered the execution of payments to and from CLS.

3.4 LIQUIDITY IN PAYMENT SYSTEMS

A liquidity in the VIBER and ICS is essentially determined by the same factors; any changes in these factors equally affect both systems and their participants. The settlement of ICS intraday and overnight clearing takes place directly in VIBER. Accordingly, for the payment transactions the participants use the same liquidity - i.e. the account balance on their payment account held with the MNB and the credit line received in exchange for the securities holdings pledged to the MNB - in VIBER as well as in the ICS overnight and intraday clearing. In the case of the ICS instant clearing the settlement takes place by including a further step. For the instant clearing, participants have to pre-finance the funds on the technical collecting account maintained by the MNB. In line with that, on behalf of the MNB, GIRO manages the instant settlement accounts for participant. In addition to the turnover that takes place, the balance can be increased or reduced to the debit or credit of the liquidity in VIBER through instant internal transfer. Outside of VIBER operating hours the liquidity can be expanded through central bank lending, i.e. by instant credit provided on the basis of securities holdings pledged to the MNB.

3.4.1 Factors that influence liquidity

Payment system participants provided sufficient liquidity for executing their payment turnover, which increased and became more volatile due to the coronavirus pandemic as well. In 2021, there was no change in the central bank toolkit affecting the participants in the payment system. The level of liquidity declined steadily in VIBER in 2021, by around HUF 600 billion to about HUF 2200 billion during the whole year. The narrowing of liquidity was attributable to the decline in the intraday credit line, which the gradual increase in the account balance was unable to offset. The intraday credit line gradually declined from HUF 2400 billion early in the year to HUF 1800 billion, stabilising at HUF 2000 billion by the end of the year. The size of the reserve requirement ratio remained unchanged in 2021, but the level of the payment account balance kept in VIBER rose steadily, fluctuating between HUF 150 and 450 billion (Chart 34). The composition of the pledged collateral behind the intraday credit line changed slightly in 2021. While the share of government bonds has expanded gradually by 10 percentage points since April 2021 and accounts for a major portion of more than 80 per cent of the collaterals, the share of large corporation loans dropped (Chart 35). Two-thirds of VIBER participants' potential liquidity comprises securities on the balance sheets of the participants that may be optionally pledged. Although the level of potential

liquidity decreased during 2021, there is still an ample liquidity buffer available for payment system participants (Chart 34).

Chart 34
Changes in the account balance and liquidity, potential liquidity and turnover of VIBER participants

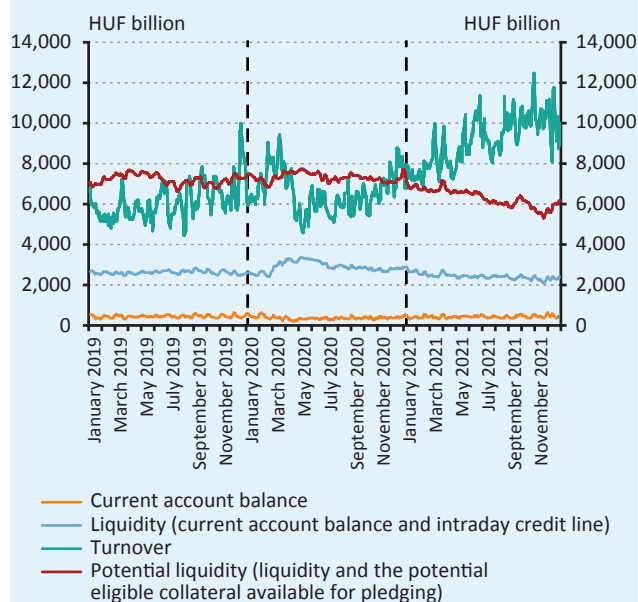
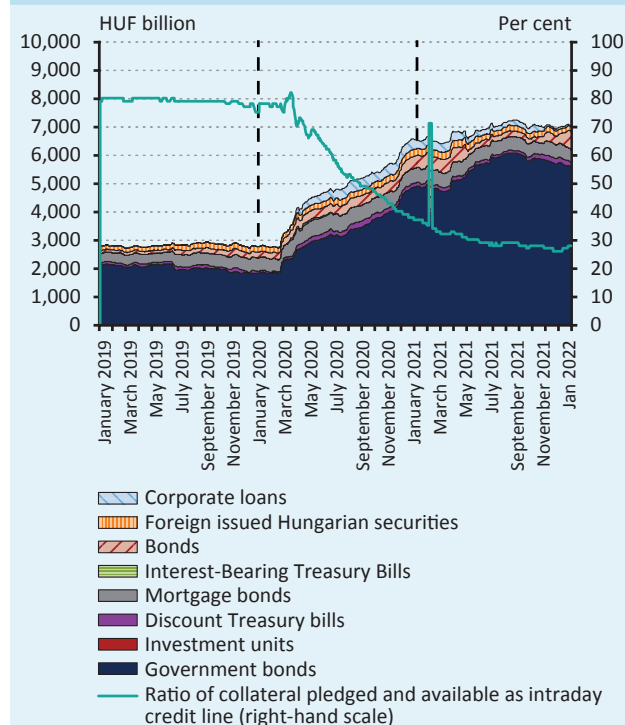


Chart 35
The ratio of pledged collateral to the credit line that can be used for payments



* Ratio of credit line that can be used for payments to the total pledged securities collateral (excluding SME loans)

3.4.2 Liquidity management of VIBER and ICS participants

VIBER

Payment system participants efficiently managed their liquidity in 2021 to settle their significantly increased turnover. Compared to the previous year, the value of the VIBER turnover increased in every time band, whereas the number of transactions declined between 9:00 and 11:00 as well as between 14:00 and 16:00 hours. While 60 per cent of the value of the VIBER turnover was initiated

before 15:00, in terms of their number, 60 per cent of the transactions were already launched by 10:00. The higher value transactions of VIBER participants, similarly to the previous years, were still settled in the late afternoon and evening hours, whereas a major part of the daily VIBER turnover was still settled in the last hour preceding the closing of VIBER. The value of transactions settled after 15:00 doubled in 2021. It is interesting that the waves of the coronavirus pandemic in 2021 were followed by payment system participants' initiations of payments as well, i.e. they launched their transactions earlier in the more severe periods of the pandemic. Compared to the previous year,

Chart 36

Intraday trends in the value and average size of the VIBER transactions (left-hand chart), as well as the number (right-hand chart) broken down by hour

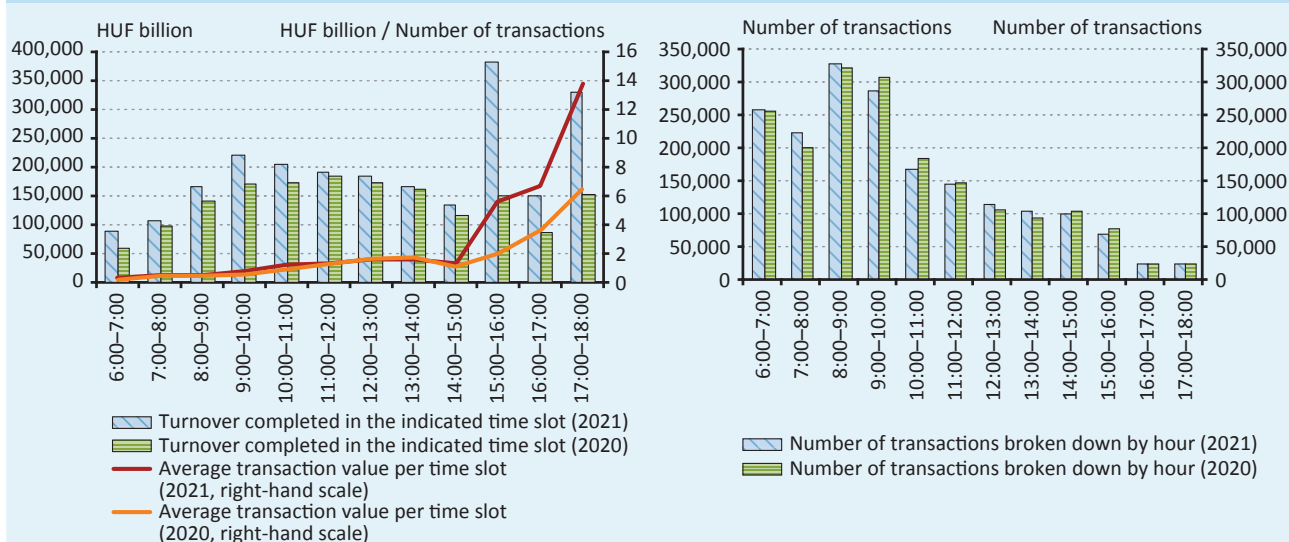
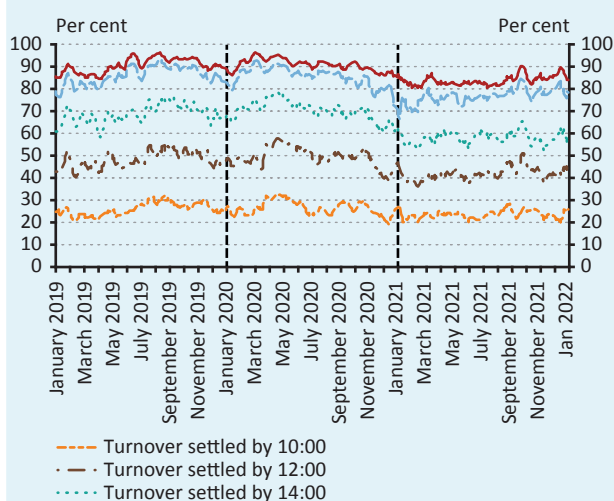


Chart 37

Timing of VIBER transactions (the portion of total value of daily transactions completed until a specific point in time)

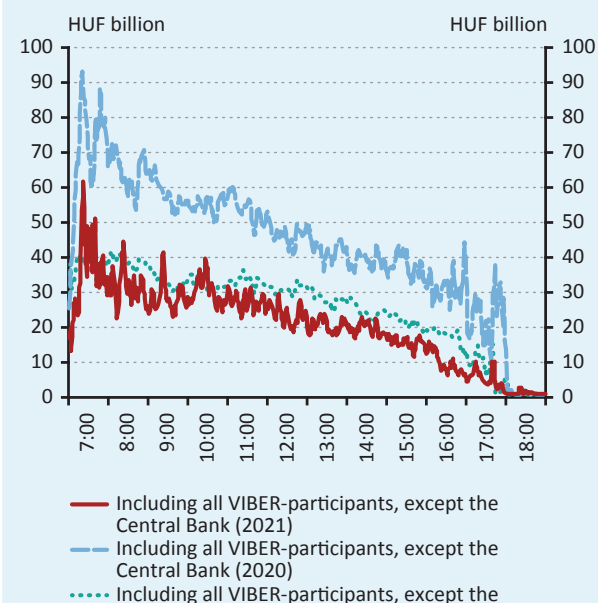


Note: Excluding the transactions of the MNB, GIRO, KELER, the Hungarian State Treasury and the Hungarian Post.

however, they executed their transactions later during the whole year; even 10–20 per cent shifts to a later time are observed in certain time bands. (Chart 36 and Chart 37)

Payment system participants used their respective credit lines in VIBER to a lesser degree compared to the previous year; the pattern by time band of the intraday use was similar to that in the pre-pandemic year. The majority of participants are able to settle their VIBER transactions relying on their account balances. The maximum utilisation of intraday credit line (MICL) at systemic level is still low (3–12 per cent), the value of which decreased by 5 percentage points compared to 2020. Projecting the annual behaviour patterns to a one-day time window reveals that the maximum intraday credit line utilisation declined during the operating hours, in certain time windows failing to reach even the levels typical in 2019. All this is attributable to the increased level of the account balances. As in the previous years, payment system participants used their respective credit lines to the greatest degree from 7:00 to 10:00. (Chart 38)

Chart 38
Value of the intraday credit line utilisation within the day



As a result of the ample liquidity in the system, still only very few of the VIBER transactions are queued due to shortage of funding. Their number and the average time spent in the queue did not change compared to the previous year. On the whole, one thousandth of VIBER

transactions were queued (2,428 in total). Most of the queuing is observed for participants that conduct active liquidity management and have high intraday credit line utilisation. Queuing occurred on 70 per cent of the working days, corresponding to an increase of 20 percentage points compared to 2020. Transactions were queued for 1 hour and 18 minutes on average, which was similar to the previous year. There were much longer queues as well, exceeding 3 hours, but the number of these cases is insignificant. Since the VIBER turnover of these participants is low, their longer queuing did not increase the clearing and settlement risk in the system. They did not cause liquidity issues for others. Within the day, queuing typically started mainly between 9:00 and 11:30 in the morning, and transactions were out of the queue by 13:00 the latest. (Chart 39)

ICS intraday and overnight clearing

In 2021, the turnover of intraday clearing cycles was balanced, and liquidity was sufficient both at systemic and individual participants' levels, and thus the clearing and settlement risk remained low. Compared to 2020, the aggregate turnover of all the cycles was higher in terms of value. The highest turnovers in terms of value are observed in cycles 1, 8 and 9. Settlement of the debit turnover of intraday clearing takes place in VIBER. (Chart 40)

Chart 39
Average queuing times and duration of queuing (right-hand chart) and its distribution (left-hand chart – 2021)

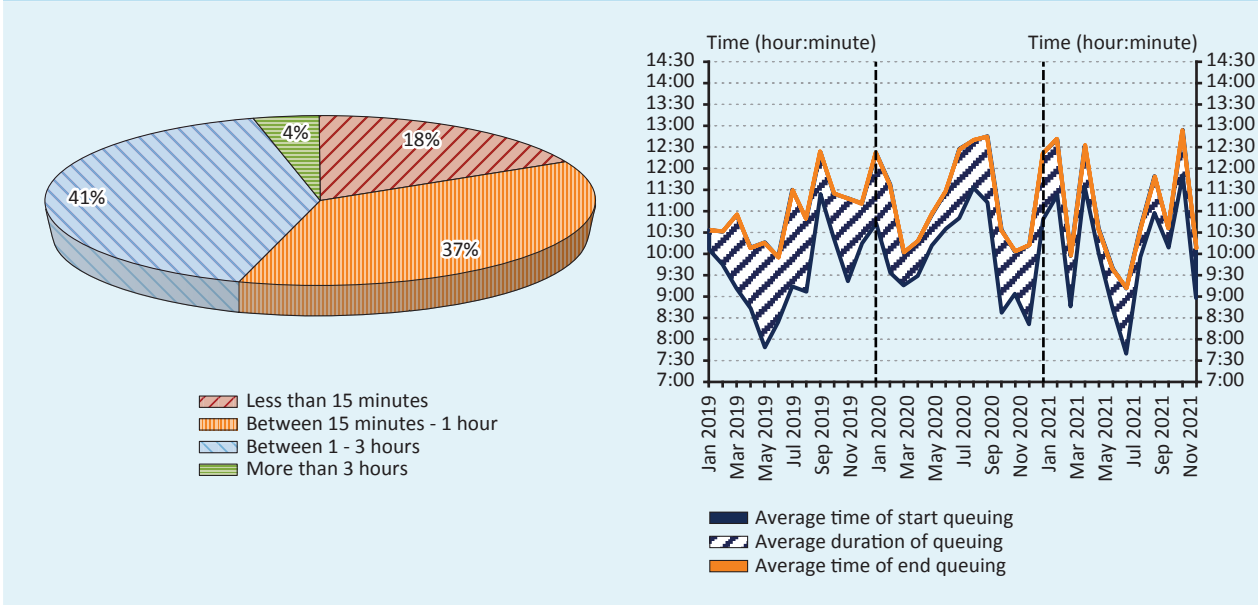
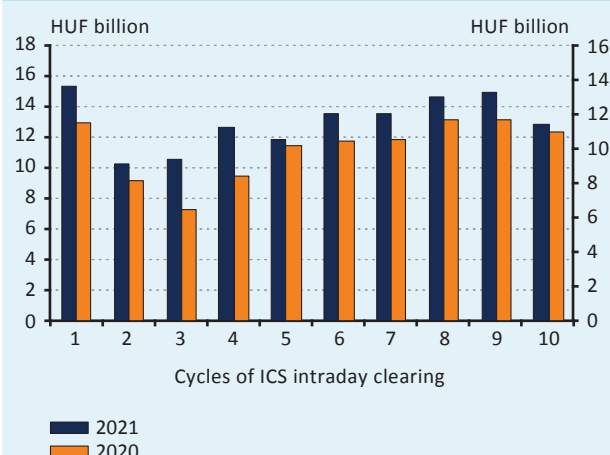


Chart 40
ICS intraday clearing turnover by cycles



Shortage of funding occurred in the ICS intraday clearing in 2021 as well, while the number of transactions affected by uncovered positions was up compared to the previous year. Compared to the 28 occasions in 2020, roll-over took place on 37 occasions in 2021. If an ICS participant fails to provide sufficient funding in VIBER for the settlement of the transactions submitted for the respective ICS cycle, the transactions left without funding are transferred to the next clearing cycle in the case of cycles 1–9, while the transactions uncovered in cycle 10 are rejected by the system. In 2021,

due to liquidity shortage, 8 ICS participants on 37 occasions in total were unable to provide cover for transactions worth HUF 135 billion, so they were rolled over to the next cycle. The lack of funds was significantly attributable to liquidity management issues. In 2021, 89 per cent of roll-overs took place through one cycle, 8 per cent through two cycles, 1 per cent of them through three cycles (Chart 41, right-hand chart). Compared to the previous year, transactions affected by uncovered positions were not rolled over through more than three cycles. Due to the hourly cycle settlement, with roll-overs spanning three or more cycles, participants breach the 4-hour rule of the MNB Decree on the execution of payment transactions. Compared to the previous years, nearly 50 per cent of the roll-overs belonged to two ICS participants with low turnover.

As in the previous years, in spite of the growing turnover, there was ample liquidity available in the ICS overnight clearing at system and individual bank levels alike in 2021. Only the direct credits of the Hungarian State Treasury and ICS participants' debit type transactions as well as the answers to these transactions are cleared in overnight clearing. In the case of overnight clearing, as a result of the once-a-day (morning) settlement method (or on one more occasion within VIBER operating hours in the case of shortage of funds), participants' continuous liquidity management is not even needed.

Chart 41
Ratio of roll-overs to total roll-overs in 2020 (left-hand chart) and in 2021 (right-hand chart)

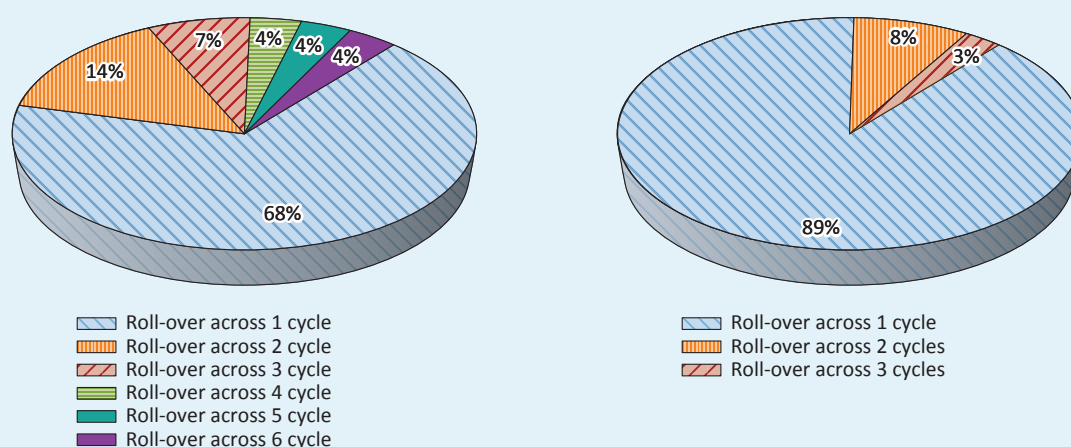
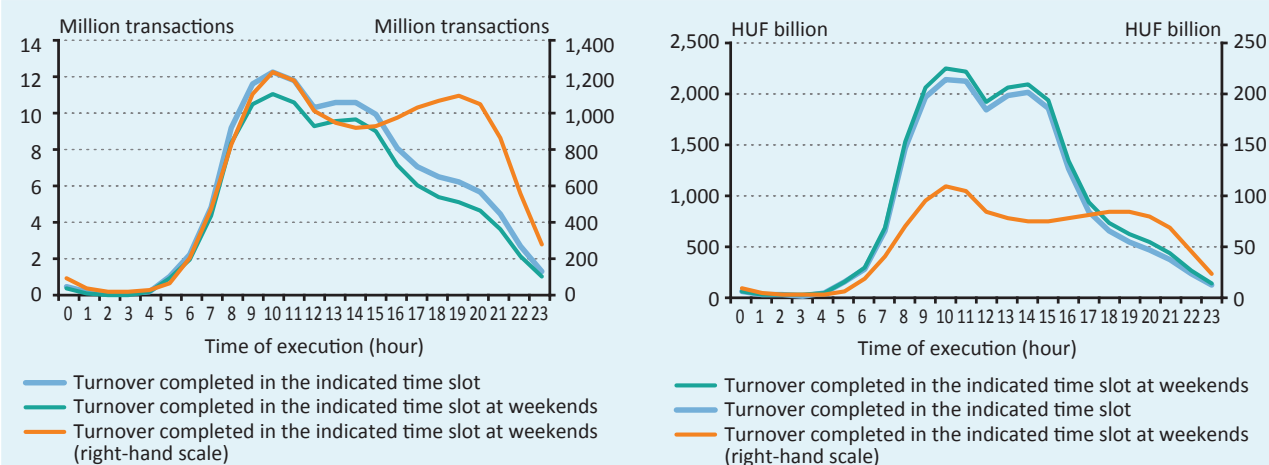


Chart 42

Intraday trends in the value (right-hand chart) and volume (left-hand chart) of the turnover in ICS instant clearing in a breakdown by hour (March 2020 - December 2021)



ICS instant clearing

For the ICS instant clearing, participants continue to carefully plan the liquidity required for carrying out the turnover. On the whole, apart from the dawn period, customers launched their instant credit transfers continuously in 2021 as well. Overall, turnover is the highest between 8 and 16 hours both in terms of the number and value of transactions. (Chart 42)

The participants' liquidity management in the instant clearing differs from that applied in the case of overnight or intraday clearing, but is also adequately used for the settlement of transfers. An important difference is that if funds are not available on the instant settlement account for the settlement of the incoming instant credit transfer, the transaction is not put in a queue, but it is rejected immediately. Therefore, participants have to continuously maintain a sufficient account balance, as their customers are informed about the rejections. In addition, sufficient funds have to be provided and liquidity has to be managed in two systems by participants: in the VIBER and in the instant clearing. In addition, on behalf of the participants, GIRO performs the liquidity top-up and allocation related to the instant settlement accounts by applying automatic control activity every quarter of an hour, on the basis of the liquidity parameters set by the participants. Participants may set the level of their respective instant payment account balances by changing the liquidity parameters. The instant credit line, with the exception of the short period after the closing and before the opening of VIBER, is available almost continuously, and thus the participants are able to bridge the unexpected liquidity shocks even during the night or

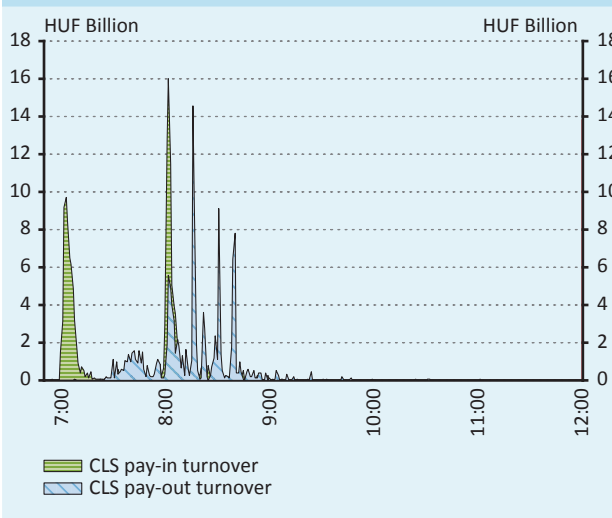
on bank holidays, which significantly reduces their liquidity risk. Participants made sufficient account balances available for nights, weekends and bank holidays as well in 2021, as there was little need for instant credit.

CLS

In 2021, payments to CLS did not cause any liquidity problems in VIBER, and thus the related clearing and settlement risk remains low. For the CLS settlement of their foreign exchange transactions with a forint leg, direct system members of CLS provided forint funding through 5 Hungarian VIBER participants as HUF-nostro-agent, since they themselves are not direct VIBER participants¹⁹.

Chart 43

Daily distribution of the average market value of the pay-ins and pay-outs related to CLS (2021)



¹⁹ Nostro bank VIBER members in relation to CLS: CIB Bank, K&H Bank, OTP Bank, Raiffeisen Bank, UniCredit Bank.

Payments related to CLS-settlement will be completed in 2 time windows specified by CLS, i.e. between 7:00–8:00 (CET) and 8:00–9:00 (CET). In 2021, daily average CLS payment turnover reached HUF 130 billion²⁰, which accounts for

0.1–3 per cent of the total daily VIBER turnover. In 2021, in spite of the substantial turnover, nostro agents made their CLS-related payments mostly relying solely to their account balances and credit lines were utilised rarely. (Chart 43)

Box

Cyber Resilience Oversight Expectations (CROE)

With the spread of the mobile Internet, the appearing of multifunctional devices and the increasing popularity of cloud services it is increasingly difficult to protect data and information. In addition, every organisation becomes dependent upon IT supply chains as well, and thus the issue of cyber security comes to the fore due to the digital ecosystem, also making cyber resilience important.

The ECB's expectations related to cyber resilience were published in 2018 (Cyber Resilience Oversight Expectations – CROE). Namely, the ECB realised that the financial infrastructures of individual nations may interconnect with one another at multiple points. Accordingly, for the adequate level of protection of the entire ecosystem it became necessary that every participant should have nearly the same cyber resilience, and thus it created the CROE.

In its oversight function the MNB considers it important to properly manage the cyber risk and thus to continuously follow cyber security related international recommendations as an overseer as well. Cyber risks mean increasing threat in financial infrastructures, which may ultimately jeopardise financial stability as well as economic growth. This threat is growing, taking into account the interdependences in financial markets between the operators and participants of the increasingly complex systems.

As part of the oversight activity it has become important to transpose the international principles related to cyber resilience into domestic practice. Therefore, in agreement with the overseers of the other member countries, the MNB included the expectations set out in the CROE in its own oversight framework and methodology as well, thus applying it to the MNB-operated VIBER, the GIRO-operated ICS and the securities clearing and settlement system run by the KELER Group, including its central counterparty activity (KELER CCP) as well (jointly: overseen payment and settlement systems). Along a risk-based framework, based on complex risk groups, the oversight activity continuously assesses, analyses and monitors the risks, operational reliability and efficiency of the overseen systems, including the evaluation of the cyber risk and cyber resilience.

In the case of the CROE the ECB identified eight principles in total, and formulated basic and innovative-level expectations in connection with them. As part of the overall assessment, the basic instrument of the compliance rating regarding the individual requirements formulated by the CROE and considered as basic expectation by the overseer is the questionnaire, which primarily serves the purpose of checking the meeting of principles. Similarly to the overall assessment, there are on-site audits and discussions in the case of the CROE questionnaire as well, the main objective of which is not only to check the correctness of the answers to the questions in the CROE questionnaire, but also to obtain personal experience, understand the basics and the processes of the operation of the system as well as to verify the practical application of the rules.

Compliance with the CROE principles is classified in line with the methodology of the overall assessment and on the basis of the methodology applied internationally as well according to a four-level scale (from fully compliant to non-compliant). The compliance rating is justified in detail in the case of all the principles, separately classifying and evaluating for all the eight principles in the case of the CROE. As a result of the assessment, oversight proposals are formulated indicating the importance of implementing them, which serves as the basis for preparing the action plan of the assessment and for the designation of deadlines. With the help of the oversight recommendations the main objective is to ensure compliance with the given principle.

²⁰ Taking into account both payments to CLS and payments initiated by CLS, the daily average transaction volume doubles, i.e. increases to some HUF 260 billion. This equals to 0.2–6 per cent of the average VIBER turnover.

SECURITIES INFRASTRUCTURES

3.5 KELER CSD

Data sheet

Chart 44
Changes in the turnover of KELER

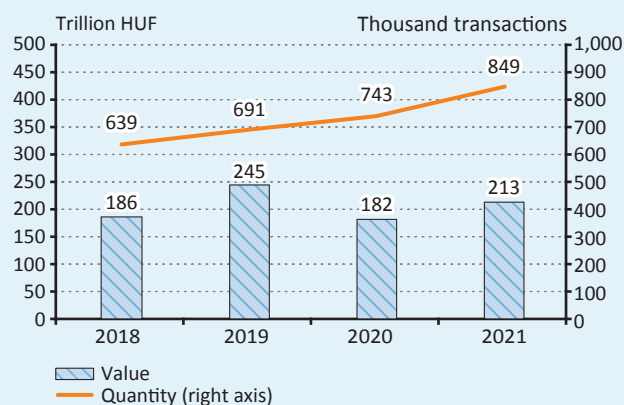
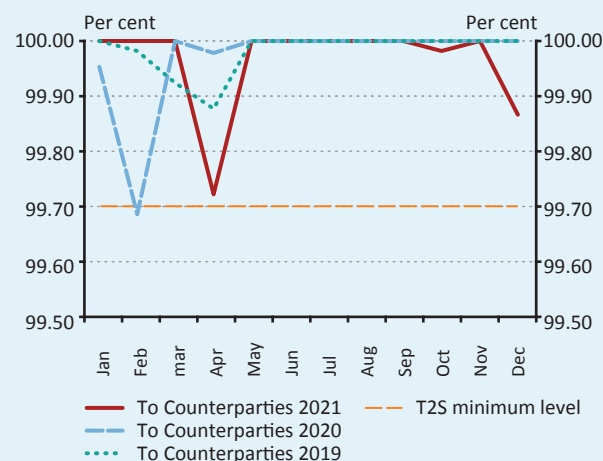


Chart 45
Developments in the availability of KELER to counterparties (2019-2021)



3.5.1 Current events

KELER Central Depository Ltd., i.e. the central securities depository (CSD) that carries out the issuance of Hungarian securities and the settlement of the transactions with them, put its new settlement and static data management system into live operation on 6 December 2021. With its new securities settlement system, KELER renewed the process of securities settlement, the monitoring of securities settlement as well as the handling of CSD static data and reports, and it also contributed to the improvement in Hungarian compliance with CSD standards prescribed by the European Union. With the go-live on 6 December 2021 an application that supports the calculation of CSD fees was also introduced, which primarily calculates settlement fees. The current phase will be closed by putting into service a penalty mechanism, which serves the compliance with the EU regime created to improve settlement discipline (settlement discipline regime – SDR²¹). In addition to ensuring the legislative expectations, the new system also complies with the conditions of operating in line with European standards, and it strengthened operational automation and reliability further.

An important achievement of the system that went live on 6 December 2021 is that it facilitated KELER's compliance regarding the so-called T2S standards. KELER joined TARGET2-Securities (T2S), the pan-European securities settlement system in February 2017, in connection with which it undertook to comply with the European standards set for the efficient use of the system. With the go-live of the KELER Services Development Programme (KSDP) on 6 December 2021, there was progress in the case of two of the remaining four standards: firstly, full compliance was achieved with the standard on data used for matching securities transactions, and secondly, partial compliance was achieved with the standard on the single settlement calendar and operating hours. The latter means that with the help of the KSDP KELER is able to ensure the availability of T2S on all of its business days for its customers, even if the given T2S business day falls on a Hungarian public holiday or non-working day. However, the thus achieved compliance is only partial because complete harmonisation with T2S night-time settlement has not been implemented yet. KELER is also planning to expand its operations within the framework of the KSDP with further functions related to T2S.

²¹ SDR Regulation: Commission Delegated Regulation (EU) 2018/1229 of 25 May 2018 supplementing Regulation (EU) No 909/2014 of the European Parliament and of the Council with regard to regulatory technical standards on settlement discipline

In addition to the fine-tuning of the existing systems and the compliance with the SDR Regulation described below, further functions and improvements are also planned within the framework of the KSDP, although the exact development portfolio will be formulated only in 2022 H2, following the working out of the new business strategy of KELER. As the developer and supervisor of the Hungarian financial infrastructure and majority owner of KELER, the MNB attaches great importance to enabling the domestic securities settlement systems to keep up with the expectations of our times and the provisions of law. Accordingly, the MNB will continue to closely monitor the progress of the KSDP.

In 2021 the value of transactions settled in KELER was up by 17 per cent and the number of transactions by

14 per cent compared to 2020 (Chart 44). The value and number of delivery versus payment²² (DvP) transactions increased by 49 per cent and 28 per cent, respectively, while the value of free of payment (FoP) transactions was 53 per cent down, although their number was 8.25 per cent up in 2021 compared to the previous year. In terms of distribution, compared to the previous year the ratio of FoP transactions to DvP transactions declined, and their value corresponded to 12 per cent of the total turnover, i.e. in terms of their trend, their share is still much lower compared to that of DvP transactions (88 per cent) in 2021. In terms of number, however, the situation is reversed, with FoP transactions dominating with 66 per cent compared to the 34 per cent share of DvP transactions. 20 per cent of the total transaction turnover took place in December 2021, which is an outlier compared to other months of the year.

Box

Summary of the annual work of the ESMA PTSC and expected regulations

The ESMA Post-Trading Standing Committee (PTSC), in which the MNB is also represented at expert level, deals with central securities depositories. Two main subjects dominated the committee meetings during the year. Firstly, an active review of the CSDR regime was going on, in relation to which the European Commission's report regarding the review of the CSDR identified the main areas where it might be worth to consider the amendment and complementing of the provisions in July 2021. During the review, ESMA and the national competent authorities participating in the PTSC contributed to the work with surveys, which were handed over to the European Commission as well, following analysis by ESMA. In the report the European Commission identified 6 topics that may serve as basis for the review of the CSDR. The parts regarding the passport issuance procedure allowing cross-border provision of services will be revised, together with the parts related to supervisory procedures and convergences. The majority of central securities depositories did not apply for operating licence for the banking-type ancillary services listed in Section C of the Annex under Article 54 of the CSDR, and thus it is the subject of the review to also examine the provisions related to providing these types of activities. In addition, the review concerns the framework related to central securities depositories in third countries as well as technical and technological innovations (e.g. tokenisation of securities). In this latter case, however, formulating concrete modification proposals may rather take place after drawing lessons following the entry into force of the DLT pilot regime. A subject of the review is the SDR Regulation as well, which was a special topic during 2021. The regulation on settlement discipline entered into force on 1 February 2022, but the provisions of the SDR related to buy-in changed again following the announcement of the so-called DLT pilot regime, and thus compliance with the relevant provisions is required another 3 years later, which period allows further clarification of or possible amendment to any questionable provision. At the same time, the provisions of the SDR related to the reporting of failed settlements and to cash penalties remain in effect in an unchanged form. Expert work concerning the detailed proposals for amendment is going on within the framework of the PTSC as well during 2022.

3.5.2 Risks

According to the information provided by KELER, the services continued to function with high reliability, while compared to the previous year there was a minimum

decline in the level of availability of business activities for counterparties in 2021. The effect on customers of incidents involving the IT infrastructure that supports the business services' is mostly traceable through the availability ratio which is directly perceptible for customers.

²² The settlement risk of transactions may be significantly reduced by the application of the delivery versus payment principle, as payment is not effected and the securities are not credited until the funds necessary for performing the transaction are available at the parties.

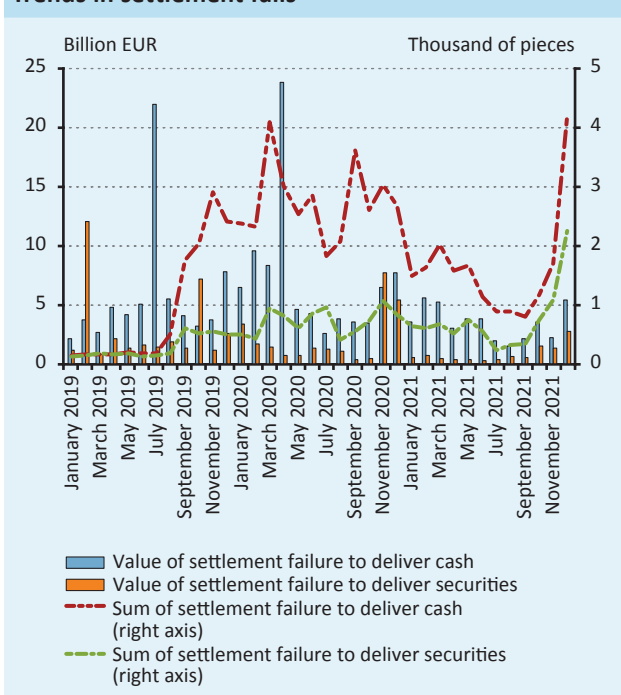
In 2021, the availability ratio was not below the generally expected level²³ in any month. In two thirds of the year, the reported level of availability to customers was 100 per cent. In 2021, the number of incidents affecting customers as well was 6, which is somewhat less favourable than in the previous year. 5 of them lasted for more than 30 minutes (for details see the footnote²⁴). Following the go-live of the KSDP, the number of incidents directly perceptible for customers increased in December and January, but the operation stabilised in 2022 Q1. (Chart 45)

Compared to 2020, the settlement risk declined with the increase in the turnover of DvP type transactions in 2021, while settlement continued to be mostly in Hungarian forint (HUF). On the basis of KELER's reporting regarding the relevant currencies under the CSDR^{25,26} it can be established that there is no relevant currency other than the Hungarian forint.²⁷ The turnover increased again in 2021, but still did not reach the 2019 level. Accordingly, it can be established that in 2021 it was more favourable in spite of the pandemic, even entailing a growth in the market. It is to be mentioned, however, that negative developments affecting inflation intensified, and may further strengthen during 2022 as well. Behind the changes it is important that the total turnover amounted to HUF 212 thousand billion compared to the previous year's HUF 182 thousand billion. This growth is mostly reflected in the HUF 60 thousand billion increase in the turnover of long-term government securities.²⁸

In 2021, 3.6 per cent of the total value and 2.1 per cent of the total volume of transactions settled by KELER failed, which is an improvement compared to 2020. During settlements, KELER executes funds transfers (cash) and securities transfers of the parties to the transaction. It is a failed settlement if the settlement of the securities transaction does not take place on the planned day of the settlement.²⁹ Finally, it is settled with a delay or results in default. In 2020, 77 per cent of all the failures were cash leg failures, whereas in 2021 cash leg failures accounted for 69 per cent of all failed transactions. In addition, a nearly

10 per cent shift is observed in the area of securities side failures. Compared to 2020, the value and quantity of failed settlements declined on both the cash and securities sides, and thus the settlement risk decreased in 2021. Most of the failures of settlements were in government securities and shares in 2021. (Chart 46)

Chart 46
Trends in settlement fails



On 1 February 2022, the SDR Regulation entered into force, and it is also an obligation of KELER to comply with it. Due to compliance reasons, KELER planned and implemented the related improvement within the framework of the KSDP. However, compliance was not achieved on time in the case of the cash penalty mechanism, improvements also failed to be tested in due course by market participants, and thus the scheduling of the project was delayed considerably. 2 May 2022 became the amended final deadline of the complete live operation of the cash penalty mechanism.

²³ At present, this level is 99.7 per cent, expected from the TARGET2 Securities European settlement platform, T2S and also from VIBER.

²⁴ There was a KELER global VPN login problem on 12 April 2021, and there were two certification problems affecting the system on 26 April 2021, an eDEMAT login problem on 6 December 2021 and a day opening problem on 14 December 2021.

²⁵ CSDR Regulation: Regulation (EU) No 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories and amending Directives 98/26/EC and 2014/65/EU and Regulation (EU) No 236/2012

²⁶ on the basis of the data reporting with MNB identification code P68, based on CSDR provisions, of MNB Decree 54/2021 (XI. 23.) on the data reporting obligations to report data to the central bank's information system primarily to enable the Magyar Nemzeti Bank to carry out its basic duties, aggregated by ESMA with the data received from the other central securities depositories

²⁷ The relative ratio of the Hungarian forint compared to the total value of settlements carried out by KELER versus payment was 99.8 per cent for 2021, while no currency reached the 1 per cent threshold value.

²⁸ The values of government securities have a significant impact on the total turnover.

²⁹ On the day set as settlement day by mutual agreement of the participants in the securities transaction and/or the one recorded as settlement date in the securities settlement system.

KELER notified the MNB as well about this incident. The MNB took notice of it, but did not approve it. Moreover, the MNB notified and informed ESMA³⁰ and the members of the PTSC³¹ about the fact and the causes of the violation of law in detail. Compliance with the SDR required significant time, human and material resources to be spent by market

participants and the central securities depositories. Nevertheless, it does not mean that non-compliance with the SDR legislation is acceptable. KELER will collect the penalties for the February–May period subsequently (in July 2022), following the go-live of the system, considering the fact that there is no exemption from applying the law.

Box

Capital market consultation series

As a committed supporter of the development of the domestic capital market, in the summer of 2021 the MNB conducted a survey in order to learn about the current situation of the post-trading infrastructure of the Hungarian capital market and the possible directions of development. Selected custodians, issuers and brokerage firms that play major roles in the domestic market participated in the survey.

The capital market survey clearly reveals that the post-trading infrastructure of the international capital market has developed significantly. In parallel with the currently general T+3 and T+2 settlement, transition to T+1 is in progress in a number of countries. In addition, T+0, i.e. same-day or, as the case may be, instant settlement is being developed and planned, which affects existing principles (such as collateral management and netting) as well, but multicurrency settlements and ‘compression’ caused by the different time zones also constitute obstacles. Market players’ priorities point to standardised and automated processes that ensure low cost levels. However, it is exactly the low cost level because of which the replacement of IT systems is not typical of the sector. Nevertheless, according to the survey, in the field of innovation FinTech actors are probably planning to automate and simplify the existing tasks and functions related to the voting at general meetings by developing their electronic voting solutions (e-voting system). In addition, the possibility of the application of distributed ledger systems and blockchain-based technology also seems to be taking shape in the possible development of the functions of central securities depositories.

The Hungarian capital market is investor-friendly, and it operates well, with excellent experts, adequate infrastructure and in an automated manner. Foreign institutions may have remote connection to the stock exchange and may be primary government securities distributors. A further advantage is that the Hungarian capital market is regulated by uniform EU legislation, and Hungary follows the global standards as well. In addition, the number of defaults is low in the domestic market. At the same time, the Hungarian capital market is asymmetrical, there are not enough issuances that could absorb Hungarian savings. Therefore, many invest in foreign products. Global investors think in regions, they arrange their investments through global custodians, and direct relations with securities depositories are not typical. One of the underlying reasons is that the cooperation between Central European securities depositories is weak, and investors do not want to establish newer and newer relations to each securities depository. Global custodians provide these relations for them.

³⁰ European Securities and Markets Authority (ESMA)

³¹ ESMA’s Post-Trading Standing Committee, in which the MNB’s Directorate Financial Infrastructures is also represented at expert level.

3.6 KELER CCP

Data sheet

Chart 47
Number and value of transactions settled by KELER CCP in the capital market and energy market

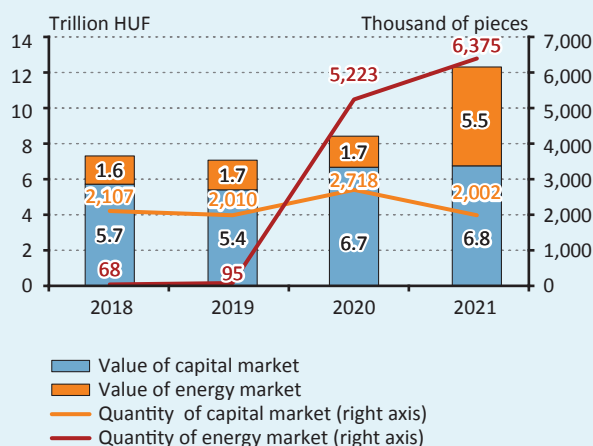
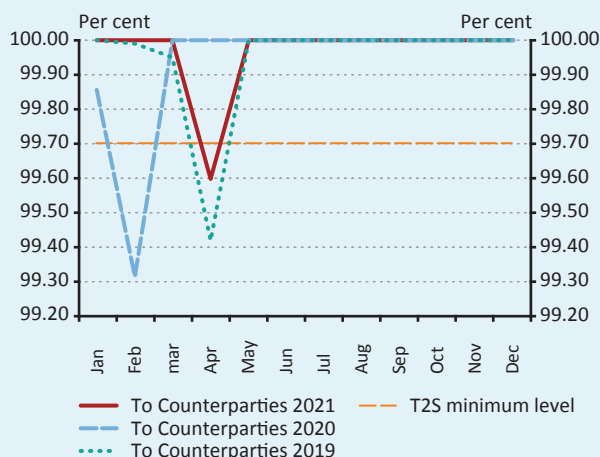


Chart 48
Developments in the availability of KELER CCP to customers (2019-2021)



3.6.1 Current events

In 2021, the turnover of markets cleared by KELER CCP increased by 46 per cent compared to 2020; of them, the performance of energy markets was outstanding. KELER CCP clears, as a central counterparty, financial instruments traded on the Budapest Stock Exchange (BÉT), on the MTF markets, and the domestic gas markets, and it provides general clearing membership services for its energy market non-clearing members for spot and derivatives electricity, natural gas and emission quota products traded on the German ECC cleared markets. In 2021, the total value of capital market transactions cleared by the central counterparty was around HUF 6,800 billion, representing a 1 per cent increase compared to the previous year. Compared to 2020, the total annual turnover of spot capital market transactions decreased by 15 per cent, corresponding to a decline of HUF 689 billion, while growth in derivative markets reached 30 per cent, worth HUF 721 billion. At the same time, in the case of spot gas markets cleared as central counterparty, the turnover nearly tripled compared to 2020, while a twofold growth was seen in the case of forward gas markets. Changes in the service related to the ECC and provided as a general clearing member were similar to the gas markets, i.e. a more than 300 per cent growth was observed in the energy spot markets in parallel with a 150 per cent increase in the forward markets compared the previous year. (Chart 47)

The gas market risk management methodologies of KELER CCP were improved, allowing a more prudent management of the risks stemming from the balancing. Reacting to the expectations of previous supervisory inspections and the defaults experienced in the balancing market, KELER CCP changed its gas market risk management methodology in order to be able to manage the risks stemming from the clearing of the gas market balancing in a more comprehensive and prudent manner. According to the already formulated and applied methodology, on the basis of the counterparty risk ratings, additional margin is imposed on high-risk counterparties, and following the implementation of the new methodologies, margin calculation at daily level is attained in the balancing market, the risks of trading platform selling positions are taken into account in the balancing market margin calculation, new stress testing and default fund calculation methods are introduced, and the calculated turnover margin is terminated in the TP/CEEGEX markets and is replaced by the so-called voluntary, limit-based trading. Following ESMA's positive validation, the ESMA CCP Supervisory Committee unanimously adopted the amendments, but at the same time 1 condition and 4 recommendations were formulated for KELER CCP.

KELER CCP's annual supervisory College meeting as per EMIR took place successfully in 2021 as well. As a result, the College found the MNB's supervisory and oversight

activity as well as the compliance of KELER CCP's operation with the law adequate. The College, which consists of the international supervisory authorities and ESMA, held its meeting on 20 October, in online form, in consideration of the pandemic situation. In the first part of the meeting, the supervisory and oversight activities carried out by the MNB in 2021, the comprehensive supervisory inspection completed in 2021, the compliance of KELER CCP's risk management and IT operations as well as the supervisory and oversight tasks planned for 2022 were presented and discussed in detail. In addition, the results of the works and consultations conducted together with the College during the year were summarised. In the second part of the meeting, the most important events of the previous year in KELER CCP, the compliance with forthcoming changes in legislation, such as the planned compliance with the framework for recovery and resolution and the framework aiming at the improvement of settlement discipline, as well as KELER CCP's most important future strategic objectives and plans were presented. During the meeting, the members of the College found both the MNB's supervisory and oversight activity as well as KELER CCP's operation according to the EMIR adequate, so the meeting was successfully closed.

3.6.2 Risks

According to the information provided by KELER CCP, the services continued to function with high reliability, while compared to the previous year there was some decline in the level of availability of business activities for counterparties. The effect on customers of incidents involving the IT infrastructure that supports the business services' is mostly traceable through the availability ratio which is directly perceptible for customers. The availability ratio was below the generally expected level³² in one month (April). In 11 months of the year, the reported level of availability to customers was 100 per cent. In 2021, the number of incidents affecting customers as well was 2, just like in the previous year. Both of them lasted for more than 30 minutes (for details see the footnote³³). The problems around the go-live of the KSDP affected KELER CCP to a lesser degree than KELER. (Chart 48)

The number of defaults declined in 2021, but their value increased compared to 2020, and thus the ensuing risks

also increased for KELER CCP. In the capital markets, KELER CCP provides guarantee for the cash and securities side settlement of transactions as well, while in the energy markets³⁴ only financial guarantee is undertaken. A significant portion (82 per cent) of the defaults is related to capital markets, 15 per cent to balancing clearing and 3 per cent to the CEEGEX market. There was no default related to the ECC markets in the period under review. Within capital markets the ratio of defaults was the highest at HUF 5.5 billion in the MTS government securities market and in the case of the stock exchange cash market at HUF 0.5 billion. Defaults took place only on the securities side, and trading errors, other external institutional errors as well as technical errors were their most frequent reasons. Defaults amounted to a total HUF 1.1 billion in the balancing market and HUF 221 million on CEEGEX. The reason for defaults among the energy market participants was the same: they did not have sufficient liquid funds to discharge their liabilities. In the energy markets, KELER CCP's non-clearing members and clearing members are usually small and medium-sized enterprises, where liquidity management takes place within less developed frameworks compared to financial institutions, and therefore the chances of shortage of funds are greater. (Chart 49)

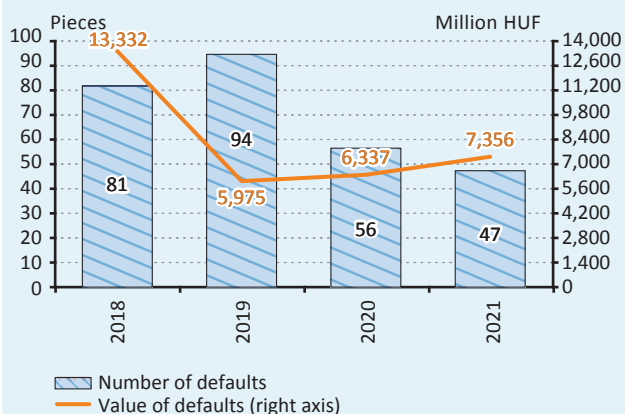
The default of EUR 1.2 million of a Hungarian gas trading company in the balancing gas market has to be mentioned, as a result of which the collaterals of the clearing member were used. The gas trading company was unable to fill the purchased amount of gas into the high-pressure gas pipe network due to the failure of an OTC purchase transaction, and thus the system operator had to balance it in the pipeline system. The arising demand for gas did not jeopardise the balance of the system, but the resulting balancing gas demand put the company under liquidity pressure, and it was unable to meet its payment obligations, so it defaulted. KELER CCP utilised the available collateral assets and free balances, which proved to be sufficient for covering the deficit; as a result, neither the innocent parties, nor KELER CCP suffered any financial losses. In the case of the gas markets, it is a recurring phenomenon that the risks resulting from OTC market activity affect KELER CCP, which works in close cooperation with the Hungarian system operator and the Hungarian Energy and Public Utility Regulatory Authority for the comprehensive management of the risks.

³² At present, this level is 99.7 per cent, expected from the TARGET2 Securities European settlement platform, T2S and also from VIBER.

³³ On 12.04.2021, the opening of the business day was late due to a KELER global VPN login problem, whereas on 26.04.2021 the certificate on the proxy server expired.

³⁴ Energy market is a generic term, comprising the electricity and natural gas markets as well. The description corresponding to the subject is used at the parts related to the separate markets.

Chart 49
Defaults in the markets cleared by KELER CCP



KELER CCP's ECC default fund contribution started to grow steadily as a result of energy market turbulences.

The increased economic growth caused by the recovery after the coronavirus, the preparation for winter weather, the low levels in European gas storage facilities, the lower than usual level of the gas shipments from Russia to Europe as well as Asia's elevated LNG needs all contributed to these developments. In 2022 the turbulences were exacerbated by the regrettable outbreak of the war conflict between Russia and Ukraine. Price explosion of an unprecedented size took place in the energy markets (three–fivefold price rise in a couple of weeks). All this resulted in steadily increasing exposures for banks,

brokerage firms and central counterparties. Consequently, the size of individual and collective collateral elements to be placed behind the transactions also rose to historical highs in 2021 H2, and the frequency and amount of intraday margin calls also increased. Meanwhile, the ECC continuously raised the margin requirements, in parallel with which the size of the default fund increased considerably, which had an effect on KELER CCP's default fund contribution as well. During the year it was in September 2021 when amounts in excess of EUR 10 million were passed on to customers proportionately to the margins for the first time. The passing on ran smoothly, customers met their extra requirements in time, and the values passed on concentrated at major energy market participants.

The exposure from VAT funding obligation in relation to the transactions declined further last year.

During the central counterparty activity performed in the case of the gas markets, KELER CCP's sale and purchase transactions with counterparties are settled at a value including 27 per cent VAT. At the same time, pursuant to the VAT regulation, if the seller of a gas product is a domestic merchant and its buyer is a foreign customer, KELER CCP has to pay the purchase price including VAT to the seller, while it can only expect the net purchase price to be paid by the buyer. In cases like that, KELER CCP also has to pay the amount of VAT from its own funds. During 2021, KELER CCP got into a VAT financing position only once, whereas KELER CCP was a net VAT receiver in the other periods of the year.

Box

Cooperation with the Warsaw Stock Exchange

The BSE, the Warsaw Stock Exchange and the MNB signed a cooperation agreement, in which they examine the joint developing of the two countries' post-trading market infrastructures. According to the agreement, the objective is to set up a holding company that provides joint clearing services and may become the owner of KELER CCP, which functions as central counterparty of Hungarian capital markets and energy markets, as well as of IRGIT, the clearing house of the Polish Power Exchange (TGE). The creation of a regional joint clearing enterprise may significantly strengthen the post-trading infrastructure of the two countries. In view of the profiles of the two clearing houses, the project may aim at the development of the clearings of the regional gas and electricity markets, as a result of which it would be possible to create a comprehensive product range that is advantageous for all the players, as well as it could have an optimising effect on the costs of trading. Based on the cooperation agreement, the joint venture is planned to be set up this year, although it depends on the due diligences necessary to be conducted by both parties as well as on the obtaining of the necessary approvals and licences from the supervisory authorities.

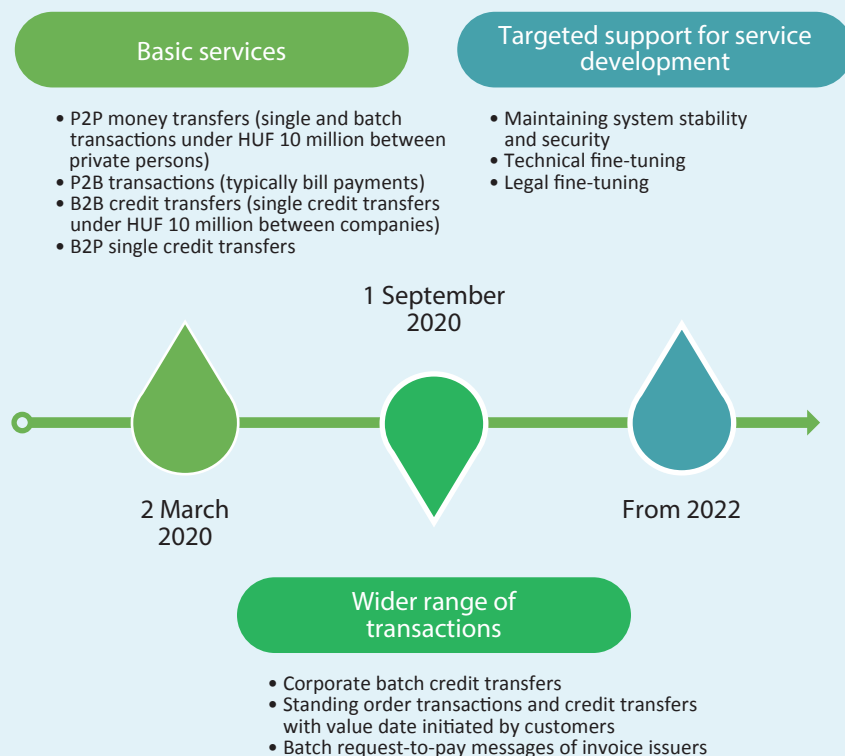
4 Current issues of payments and financial market infrastructures

4.1 THE COMPLETION OF THE INSTANT PAYMENT ECOSYSTEM IS THE THIRD PHASE OF THE DEVELOPMENT

In the past decade, the MNB took numerous steps to support digital transformation. One of the greatest steps was the nationwide introduction of the instant payment system on 2 March 2020. Upon the introduction of instant payment, the MNB's express objective was to offer an electronic payment solution that is easy to use in any payment situation for the conducting of transactions, thus further enhancing the spreading of electronic payments. Upon the start, availability of the basic service at all market participants became mandatory. Accordingly, electronically

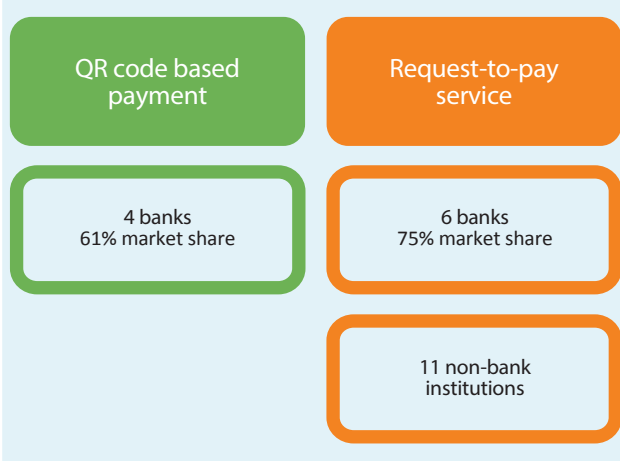
initiated individual and retail batched domestic forint credit transfers without a value date and below the limit of HUF 10 million have to be executed within 5 seconds. It was followed half a year later by the second phase of the instant payment ecosystem, when the scope of transaction types that can be submitted to the central system was extended to corporate batched credit transfers, regular and timed payments as well as to bill issuers' batched requests to pay. At present, the third phase of the instant payment ecosystem is in progress with the appearance and gradual spreading of end-user services based on the central system, within the framework of which the MNB intends to take further steps in order to simplify and accelerate the processes. (Chart 50)

Chart 50
Phases of the instant payment ecosystem



Within the framework of one of the most important steps of completing the ecosystem the MNB intends to achieve full market coverage, and therefore it is examining whether to make the capability of QR code reading and of receiving requests to pay mandatory. From 2021 data it is seen well that the services are spreading (Chart 51), but their usage in practice has not been achieved yet due to lack of wide acceptance, which is attributable to the fragmentation of the market through the appearance of services which are not interoperable with other services. The MNB's objective is to terminate market fragmentation by regulating the QR reading ability and the ability to receive requests to pay. In addition, market feedbacks also show that full coverage is important for both merchants and bill issuers to allow the wide spreading of new types of payment solutions in the market.

Chart 51
Coverage of banking services available at end-2021



In order to increase everyday usability, the MNB is also committed to increasing the transparency and preserving the security of the payment process. Therefore, it is examining the regulation of the standardised positive feedback that indicates the success of transactions and the introduction of a QR code authentication procedure to be implemented in a central system. In the case of the former, the MNB intends to regulate the feedback processes of on-us transactions and processes of interbank transactions, thus creating stronger competition among market members. In the case of the latter, based on market feedbacks the MNB is making a proposal for the amendment to the domestic QR code standard for an even more secure fulfilment of the transactions and for ensuring that the data in the QR code do not change during the transaction. In order to support it, GIRO is examining the setting up of a central system in connection with the authentication of QR codes. The details of the new standard would be regulated in an annex to the MNB Decree on payment transactions

in order to make payments with QR codes available at all market participants with the same technical conditions, in an interoperable manner.

In the current development phase of the ecosystem, in order to ensure an even wider use of instant payment, the MNB is examining the raising of the current value limit to HUF 30 million. Already upon the introduction of the instant payment system the MNB indicated to market participants that raising the HUF 10 million transaction limit might take place even in the short run with the development of the ecosystem. Therefore, the MNB encouraged market participants to be able to set the changing of the value limit parametrically. When examining the raising of the limit, the MNB is looking at two aspects. Firstly, what this change would result in for market participants in terms of liquidity management, and secondly, what risks the raising of the value limit would mean from the fraud prevention side. At the same time, irrespective of the raising of the value limit, the MNB intends to address the latter factor with the measures presented in Chapter 2.3.2 as well in connection with the frauds affecting credit transfers in general.

An important means of protection against fraud may be the setting up of a central fraud monitoring system, which works in many places in the international scene as well and is also an expectation of domestic market participants. The MNB has started to examine it in collaboration with GIRO. Through the analysis of transactions, a central system may provide useful information to market participants, and thus it may be an adequate complementary tool of banks' fraud prevention systems, contributing to the early identification of fraud patterns as well as to the fast recognition and efficient prevention of the related attempts.

In addition to the creation of full market coverage and interoperability, the MNB encourages the use of new types of payment solutions by various means of communication as well. A part of that is an identity manual, in which the MNB presents, along detailed rules, how the logo (Chart 52), lettering and other visual identity elements related to instant payment have to be depicted in various physical shops, electronic platforms or invoice letters. The manual precisely defines the size and colours of the logo as well as its relations with other symbols and captions. Another part of the means of communication is the compiling of an information material with the involvement of banking actors to make the commercial sector aware of the use of the various payment solutions already prior to the wide-ranging appearance of the services as well as to allow them enough time for elaborating their strategy with their respective payment service providers in order to exploit the business possibilities. The MNB's objective is to be able to inform

consumers as well as retailers jointly and simultaneously with market participants and to present the opportunities inherent in the new types of payment solutions to both sides at the same time.

Chart 52
Logo of instant payment

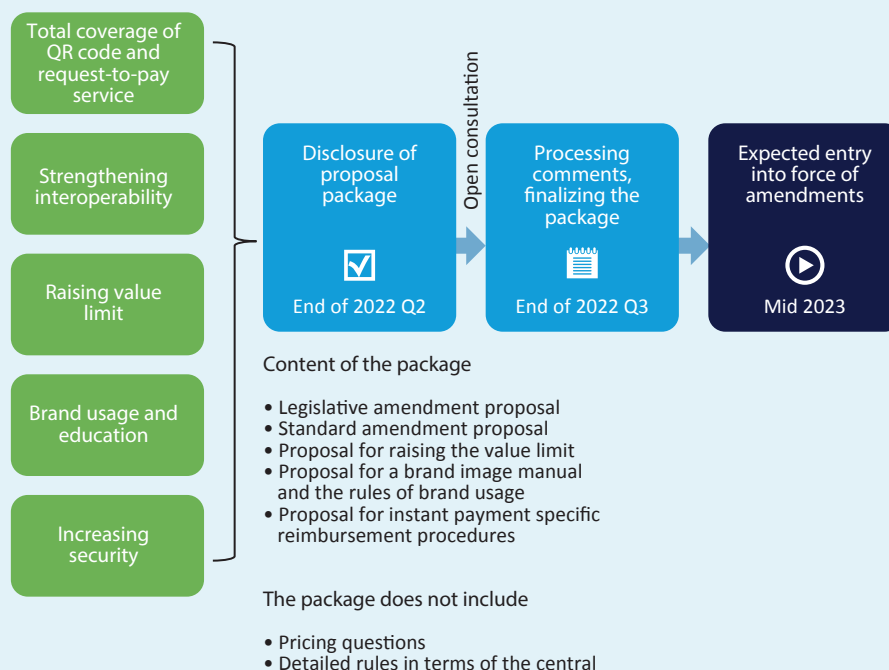


By examining the implementation of the refund procedure that helps customers in trading transactions (so-called chargeback process) the MNB strives to provide even wider support to consumers. At present, in the case of credit transfers – contrary to card transactions – there is no refund mechanism that could ensure the recovery of the paid amount for the consumers in certain cases. This, especially in retail payment situations, in the case of problems related to the transactions or the purchased products or used services may have a disadvantageous impact on the assessment of instant payment transactions

by consumers, and thus on the more frequent use and spreading of instant payment. At present, the MNB is examining the creation of an AFR-specific refund process in the case of the most frequent retail problems, such as non-performance or defective performance as well as technical errors or frauds. In addition, the MNB's objective – in the case of the introduction of adequate protective mechanisms, even if they might have a cost increasing effect – is to ensure that the instant payment system may be more favourable in terms of merchants' costs compared to the current modes of payment, thus preserving the competitiveness of instant payment.

The developments of the third phase of the instant payment ecosystem and the shaping of the framework that supports the developments are already in progress, and the MNB is committed to the creation of further service development possibilities and to the increasing of their usability. Nevertheless, it also needs to be seen that the encouraging of the usage of the ecosystem depends not only on the MNB but also on market participants, as the creation of the services is primarily their task. Therefore, the MNB continues to expect market participants to offer these services in a wide range in the coming years, as the results of the consultations held with merchants to date suggest that there is market demand for the use of the services. The MNB is going to present the completed proposal package within the framework of open consultation, in which it will take into account market feedbacks as before. (Chart 53)

Chart 53
The way of developing the instant payment ecosystem



Box**European development projects related to instant payments**

The procedure of admission of new members of the request-to-pay (SRTP) scheme within the Single Euro Payments Area (SEPA) created for the European interoperability of the request-to-pay service started in 2021. In 2021, as the owner of the SRTP scheme, the European Payments Council (EPC) designated the body that is responsible for the due diligence of the applicants to the scheme and for the evaluation of the applications. At the same time, the opportunity to initiate the procedure of admission of new members also opened, and as told by the EPC, already many inquirers indicated their related interest. All this may significantly contribute to the practical application of the request-to-pay service in a way that ensures interoperability at European level. In connection with that, already several European clearing houses, such as EBA and Iberpay have already indicated that they would provide the processing of SRTP messages for the payment service providers connected to them.

In 2021, the updated version of the SRTP rulebook was published, which supports the spread of the request-to-pay service with further functionalities. Following three months of open consultations, the second version of the SRTP rulebook was made public in November 2021. Perhaps the most important amendment is that the standardisation of the API-based communication started in the rulebook, which may ease the forwarding of request-to-pay messages in the future. At the same time, as opposed to amendments to other rulebooks, due to the expected significant need for development and further questions to be clarified, no specific deadline has been set for the introduction of the API-based communication.

The EPC has also started to work out a European QR code standard that supports mobile payments. During 2021 the EPC prepared a working material for the QR code standard that supports retail instant payments. Following that, in February 2022, open consultation started about the expanded QR code standard, which, according to the plans, would already support the carrying out of credit transfers initiated by a mobile device in any (i.e. not only retail) payment situation. At the same time, a deviation from the Hungarian standard is that in addition to instant credit transfers, the QR code data transmission could be used for initiating 'normal' credit transfers as well. The document finalised after the consultation is planned to be standardised at an international standardisation organisation (e.g. ISO).

4.2 CHANGES IN PAYMENT HABITS

There are numerous economic advantages of the spreading of electronic payments. In view of them, the two main pillars of the MNB's payments strategy are that some kind of electronic payment option should be available in any payment situation and that as many customers should take the opportunity of electronic payment as possible. In order to follow the level of penetration and use of electronic payments as well as to have the best possible insight into the individual players' underlying motives in the case of the use and acceptance of modes of payment, the MNB continuously examines individual market participants' payment habits. In addition, from time to time it examines

the social cost of the modes of payment, also striving to quantify the total use of resources entailed by the use of the modes of payment (spending of time, means and money, excluding the fees paid for the payment services), thus examining the possible change in efficiency at the level of the society resulting from the use of the modes of payment.

4.2.1 Households' payment habits^{35 36}

Already many electronic payment solutions are available that may ease our everyday life, and as a result of that as well, in 2020 already 80 per cent of the adult population used electronic payment options. Within the openness³⁷ to electronic payment, in the case of bill payment it is seen

³⁵ MNB's study on the payment habits of the households' payment habits: <https://www.mnb.hu/letoltes/mnb-op-143-final.pdf>

³⁶ Series of articles based on the MNB's study on the households' payment habits (only in Hungarian):

Part 1 – Bank account coverage is not an obstacle to the spreading of electronic payment any longer: <https://www.mnb.hu/letoltes/lakossagi-fizetesi-szokasok-1-resz.pdf>

Part 2 – Already 80 per cent of the population use electronic payment options: <https://www.mnb.hu/letoltes/lakossagi-fizetesi-szokasok-2-resz.pdf>

Part 3 – What we pay by also depends on age, qualifications, our employment status and income: <https://www.mnb.hu/letoltes/lakossagi-fizetesi-szokasok-3-resz.pdf>

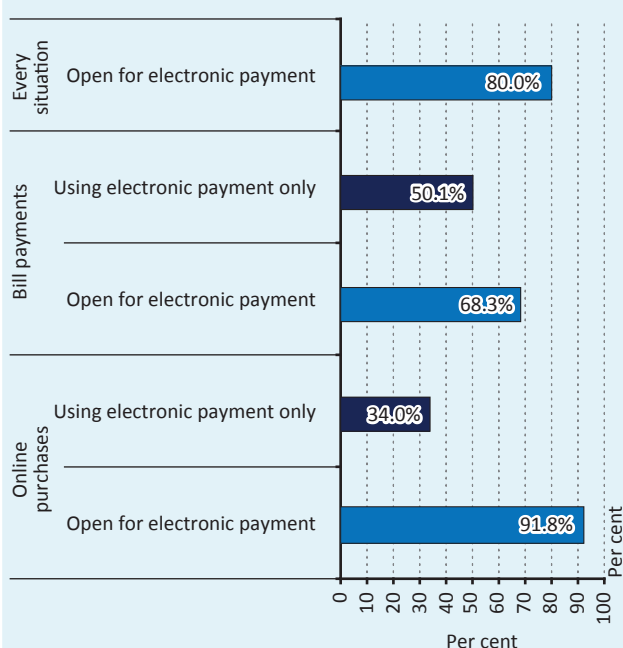
Part 4 – Half of the population (would) prefer to pay electronically: <https://www.mnb.hu/letoltes/lakossagi-fizetesi-szokasok-4-resz.pdf>

³⁷ Openness to electronic payment was established by asking whether the given respondent used at least one electronic payment method in the one month prior to the query.

that 68 per cent of the population use electronic payment, and within that, 50 per cent of the population pay their bills only electronically. 92 per cent of those shopping on the Internet pay electronically (by bank card on the Internet or upon receipt, by individual credit transfer or non-bank FinTech payment application). Within that, 34 per cent of shoppers on the Internet use these payment options exclusively. The rise in popularity of electronic

payment options can also be explained by the impact of the coronavirus pandemic. (Chart 54)

Chart 54
Ratio of inhabitants using electronic payment (2020)

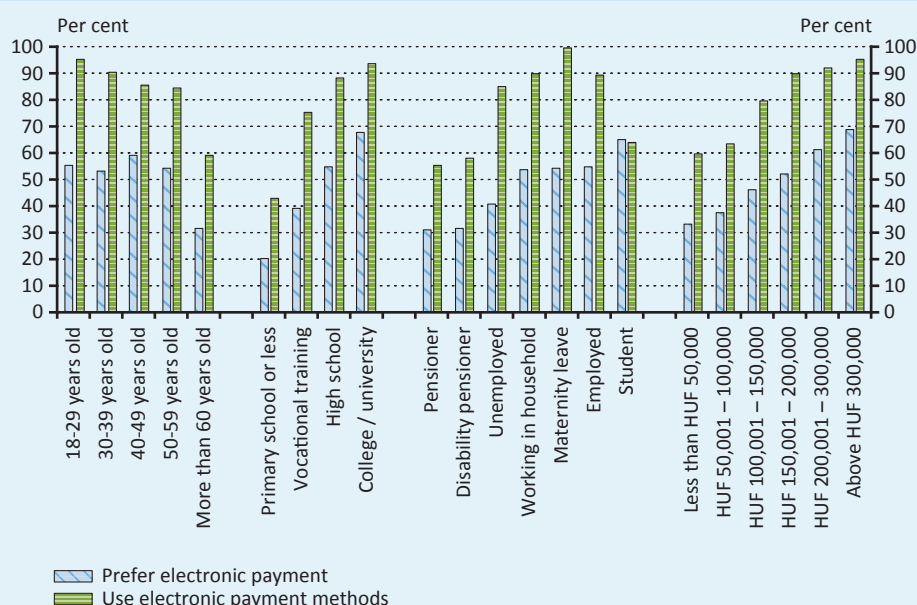


Note: In the case of online shopping, the shares within those shopping on the Internet are indicated.

The use of the individual payment methods and the choice among them are different for the groups created on the basis of certain sociodemographic factors (age, qualifications, workplace status, per capita income of the household). Younger age groups as well as strata with higher qualification and per capita income prefer to pay electronically, and a higher ratio of them use electronic payment methods. There are significant differences across the various groups. For example, while the ratio of use is minimum 85 per cent in the case of the below 60 age groups, it is only 60 per cent for those over 60 years of age. In addition, the ratio of electronic payment users is rising from 43 per cent to 94 per cent with the increase in educational level. (Chart 55)

The spread of electronic payment may continue to be hindered by cash income and the pricing of services. In spite of the fact that many people prefer the use of electronic payments, it is not reflected to that degree in the distribution by the number of transactions. There may be many reasons for that, including the income received in cash. Although its ratio is declining gradually, 15 per cent of the population received their income entirely in cash in 2020, while another 8 per cent received electronic and cash incomes as well. In addition, it may also be the case that they would pay electronically, but it is not possible. This problem will hopefully arise much less often as a result of the statutory provision regarding the mandatory provision of the option of electronic payment introduced as of

Chart 55
The ratio of those who prefer and use electronic payment by groups created on the basis of sociodemographic factors (2020)



1 January 2021 concerning those obliged to use online cash registers. Nevertheless, pricing is also an important factor; according to the survey, one third of the population would opt for electronic payment more often if banks' services were cheaper.

At four fifth of the population there is ample room for increasing the number of electronic transactions. With the help of group analysis we put those electronically paying individuals in proper order who are similar in terms of the number of card payments, credit transfers and cash withdrawals, per capita income and age. One fifth of the population that have electronic income may be considered active in terms of payments. Those who often do shopping electronically perform an average 25 electronic transactions a month. This group has the highest income per capita. In addition, 40 per cent of the population with electronic income, who do electronic shopping occasionally, perform the fewest cash withdrawals. On the basis of average age and income, which is the lowest in this group, the concentration of students and young employees is the highest here. Although the members of the group of those who occasionally pay electronically know and use the available electronic services, due to various reasons the number of their transactions is much below that of the previous group. In this group there is ample room to increase the number of transactions, which may mean the basis for the hoped growth in the coming years, and therefore it is worth to examine their underlying motives in more detail as well.

More than half of those who do electronic shopping occasionally can be considered electronically committed.

48 per cent of this partial group make credit transfers. Although it exceeds the average of the total population (47 per cent), it is well below that of the electronically active group (84 per cent). The ratio of those who find their banking costs too much is the highest in the case of occasional electronic shoppers. Within that, in the case of the electronically committed the share of those who would pay more often electronically if it was cheaper is significant (49 per cent of them answered like that). On the whole, it can be established that of the occasional electronic shoppers, for the electronically committed ones it is clearly the pricing of services that significantly affects their payment habits, so favourable pricing may have the greatest importance in their case. At the same time, in addition to advantageous pricing, the development of innovative services (such as the ones relying upon instant payment) and various incentive measures may play an important role in the case of those who are not committed electronically.

40 per cent of the population who have electronic income rarely do electronic shopping.

The average age of this stratum is 64 years, i.e. the concentration of pensioners is high. For the group of infrequent electronic shoppers, it is likely that the growth in electronic transactions will not be driven by favourable pricing and innovative services, but other supportive measures will also be needed.

Table 1
Main results of the group analysis related to payment habits

Group	Number of elements	Average number of card payments	Average number of credit transfers	Average number of cash withdrawals	Average income per capita (HUF)	Average age (year)
Rare electronic payers	435	5.8	0.34	1.27	143,108	64.1
Occasional electronic payers	439	9.1	0.95	1.25	133,142	38.9
Frequent electronic payers	230	22.7	3.9	1.9	213,412	46.1

4.2.2 Corporate payment habits

In addition to consumers' payment habits, the MNB regularly analyses undertakings' choice of payment method as well. The central bank conducted a questionnaire survey about payment habits among domestic retailers and undertakings in early 2020, using samples of 300 elements in both cases. These surveys allow the collection of detailed background information about the operating data of undertakings as well, which helps

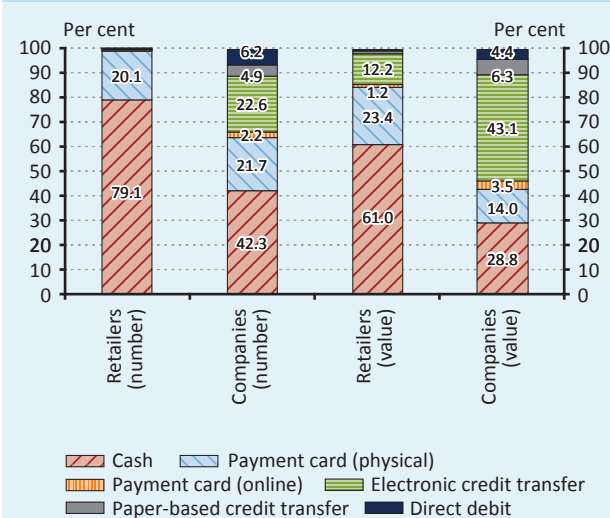
to better understand the underlying factors that influence the use of payment methods. In addition, with the help of the online cash register database the MNB is also able to monitor the developments taking place in the retail sector with high reliability. Using the two data sources, central bank research for 2019³⁸ was conducted in this subject.

While cash plays an extremely important role in payments in the case of retailers, credit transfer is more important for other businesses. At the same time, the use of payment

³⁸ <https://www.mnb.hu/letoltes/fer-20-2-st2-deak-kajdi-nemecske.pdf>

methods is also related to the value of transactions. Higher-value payments are more typical in the case of credit transfers, while there are extremely many low-value cash transactions. A similar difference is observed according to the size (headcount) of undertakings as well: while the use of cash is much higher in the case of the smaller ones, the ratio of credit transfers and card payments is greater in the case of bigger enterprises and bigger retailers, respectively. In addition, the findings revealed that the ratio of incoming cash transactions is also correlated to the degree of undertakings' wage payments in cash. (Chart 56)

Chart 56
Distribution of the incoming payment turnover of retailers and companies (2019)



Undertakings' probability of card acceptance is primarily related to their size (proceeds from sales, number of sales outlets). Both the questionnaire analysis and the analysis of OCR data confirmed the role of the size of businesses in card acquiring, i.e. the fact that bigger ones are more likely to provide this payment method for their customers. Another important factor is the average

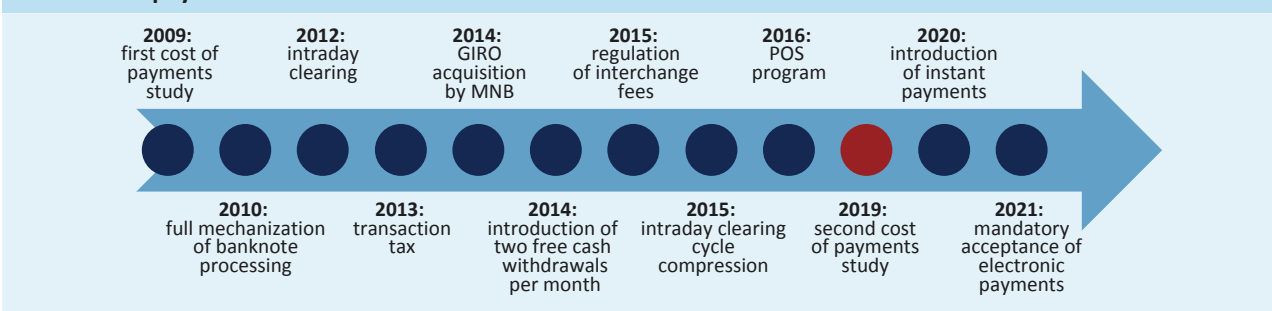
value of purchases, as consumers tend to use their cards in the case of purchases with higher basket value. When asked about the underlying reasons, respondents to the questionnaire typically indicated customers' indifference to or disinterest in electronic payment options as well as bank costs as the main reasons for not providing card acceptance. It is important to note, however, that the research was conducted for 2019, and thus the effect of the legislation introduced in 2021 according to which the provision of electronic payment options is mandatory did not yet prevail in the case of merchants obliged to use OCRs.

4.2.3 Time is Money: A survey of the social cost of payment instruments³⁹

Following 2009, similarly to many European central banks, in the past years the MNB repeatedly assessed the social costs of payments. The analysis focused on the development of payments that took place since 2009 as well as on quantifying the social costs entailed by the individual payment methods on the basis of the pan-European methodology coordinated by the ECB. The assessment of social costs related to payments is essential because it allows the quantifying of the total use of resources (spending of time, means and money, excluding the fees paid by the participants in the chain of payments to one another) required for the conducting of payments. And that allows the examination of the efficiency of the individual modes of payment and of all payments in Hungary as well as its change, which has an impact on competitiveness and economic growth.

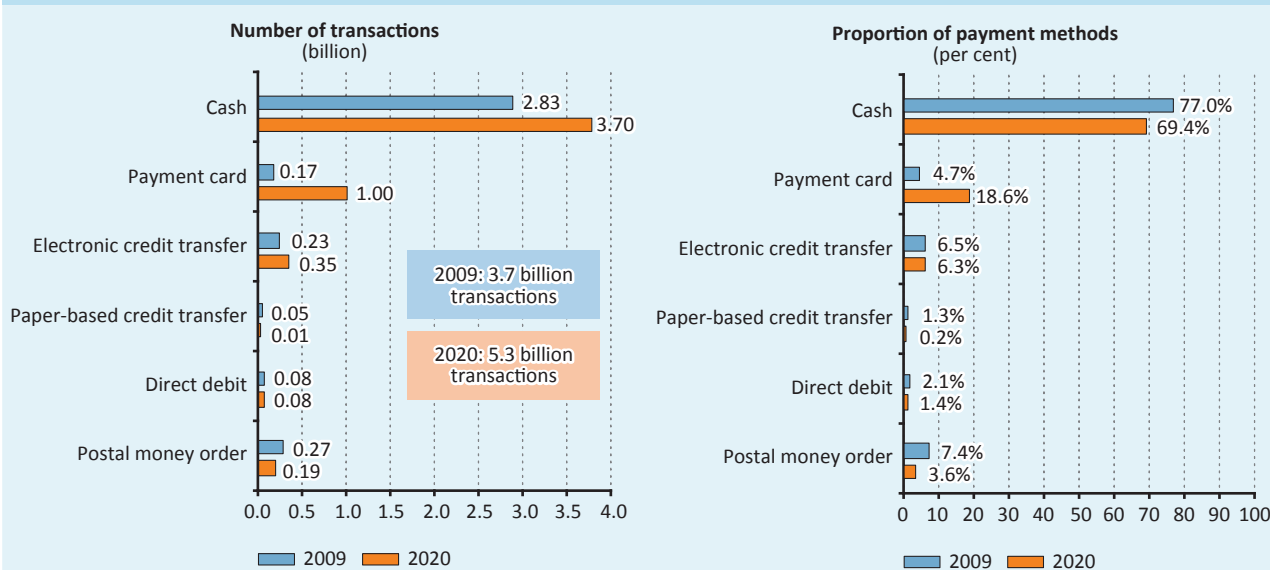
Within the framework of the analysis, the MNB examined almost all the relevant players of the chain of payments, and found that during the past 10 years numerous changes affected the efficiency of domestic payments. These changes include the complete mechanisation of banknote processing, making the frequency of the cycles higher in intraday clearing and the POS deployment programme. It

Chart 57
Evolution of payments



³⁹ The data and information in this chapter are preliminary. They will be presented in detail in a study to be published in June 2022 in the Financial and Economic Review, Vol. 21, Issue 2.

Chart 58
Changes in the number of transactions and proportions of the main payment methods



Note: As the cost data are for 2019, or for 2020 in the case of some sectors, the chart shows the numbers of transactions in 2020.

is important to note, however, that there have been various important improvements and amendments to legislation since the survey as well, such as the introduction of the instant payment system or the mandatory acceptance of electronic payment, the effects of which are only partly reflected in the survey, through the changes that occurred in households' payment habits prior to the autumn 2020 survey. (Chart 57)

In the period under review, with the appearance of increasingly efficient and more comfortable modes of payment, payment habits changed considerably, and in the case of cards the acceptance infrastructure also expanded significantly. As a result, the ratio of electronic payments was up remarkably between 2009 and 2019. In parallel with that, in view of the economic growth and the change in shopping habits, the number of transactions grew to one and a half times higher. While the number of card payments quintupled, the number of cash and credit transfer transactions increased by 30 per cent. (Chart 58)

As a result of the above developments, the social cost (time and means spent on payments) of the payment

methods corresponded to 1.7 per cent of GDP, i.e. HUF 832 billion in 2019. However, to be able to examine the actual change in the efficiency of payments it is necessary to exclude the effect of the increase in wages and of inflation, because the average wage nearly doubled in 10 years, while inflation raised the prices to 1.3 times higher. The social cost adjusted for the wage increase and inflation amounted to HUF 461 billion, corresponding to a mere 20 per cent real growth in 10 years. This is much lower than the expansion in turnover seen during this period. In parallel with that, in the case of banks and cash-in-transit companies the adjusted cost of cash and credit transfers for the society as a whole is also lower than the figure for 2009 due to the downsizing of the cash infrastructure at bank branches, the improvement in cash recycling and the shift of nearly 100 per cent of credit transfers to electronic channels. The card acceptance infrastructure as well as the card turnover expanded considerably. This is the main reason for the increase in the total cost belonging to cards seen after the adjustment as well, mainly at retailers and companies. (Table 2)

Table 2**Difference between adjusted 2019 and 2009 social costs in HUF billion**

	Cash	Debit card	Credit transfers	Direct debits	Postal money order (yellow cheque)	Pension	Total
MNB	-0.86	0.11	0.05	0.00	-0.42	0.00	-1.12
Cash-in-transit companies	-5.45	0.00	0.00	0.00	-0.93	0.00	-6.38
Payment service providers including the Hungarian Post	-39.32	16.75	-7.98	-2.31	-7.06	-4.09	-44.01
Businesses (including retailers)	32.34	53.35	17.67	2.90	-2.91	0.00	103.35
Households	7.67	5.16	-11.37	-0.08	15.02	0.00	16.40
State	-1.17	0.15	0.21	0.02	-0.09	0.00	-0.88
Total	-6.79	75.52	-1.42	0.53	3.61	-4.09	67.36

Note: The data in the table are preliminary. The calculations and background information will be presented in detail in a study to be published in June 2022 in the Financial and Economic Review, Vol. 21, Issue 2.

The per transaction cost adjusted for wage increase and inflation declined in the case of cards, cash and credit transfers, which shows improving efficiency. The adjusted 2019 costs per transaction are lower than the 2009 values in the case of the most popular payment methods, i.e. cash,

card and credit transfer. As by now it has become possible to pay electronically in the majority of retail payment situations, costs per transaction are expected to decline further with the expansion in turnover in the coming years. (Table 3)

Table 3**Costs per transaction in HUF**

	Cash	Card	Credit transfers	Direct debits	Postal money order (yellow cheque)
Unit costs in 2019	104	233	360	165	352
Unit costs in 2019 (adjusted)	67	109	228	137	264
Unit costs in 2009	74	201	270	100	144
Difference (Unit costs in 2009 (adjusted) – Unit costs in 2009)	-7	-92	-42	37	120

Note: The data in the table are preliminary. The calculations and background information will be presented in detail in a study to be published in June 2022 in the Financial and Economic Review, Vol. 21, Issue 2.

4.3 CHANGES CONCERNING SZÉP CARDS AND THEIR IMPACT ON THE DEVELOPMENTS IN THE RELATED TURNOVER

In the past one and a half years, many amendments were made to the regulations regarding SZÉP cards, which are among the most widespread non-cash payment instruments. The primary intention of these amendments was to offset the negative impacts of the coronavirus pandemic on the tourism and catering sector. In the period between 22 April 2020 and 31 December 2021, the tax

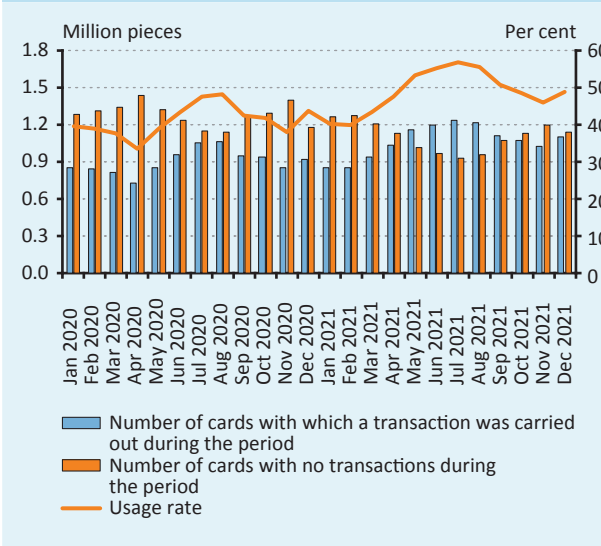
burden on SZÉP cards declined from 32.5 per cent to 15 per cent, since the amounts considered as fringe benefits and transferred to the SZÉP card sub-accounts were not burdened by social contribution tax obligation, which resulted in major savings for employees. As significant amounts accumulated on the SZÉP cards due to the coronavirus pandemic, pursuant to the amendment to the SZÉP card Decree⁴⁰ effective as of 25 April 2021, the funds available on the individual sub-accounts can also be used for paying for the services belonging to another sub-account, which change in legislation facilitates the utilisation of the amounts available on the cards. In addition, the

⁴⁰ Government Decree No 76/2018 (IV. 20.) on the rules of issuing and using Széchenyi recreation cards

Government Decree published on 27 March 2021 allowed for 60 days following the termination of the state of emergency the unchanged spending (without deductions) of the funds transferred to the card not earlier than two years before. As a further measure, the limit amount qualifying as fringe benefit transferable to the credit of the SZÉP card by employers also increased in the Act on Personal Income Tax. In addition, pursuant to the provisions of the Government Decree announced on 24 December 2021, between 1 February 2022 and 31 May 2022 it is possible to pay for food by SZÉP card in shops as well, which is expected to further raise the related transaction turnover.

As a result of the changes in the regulations concerning SZÉP cards, more and more employers and employees opt for this element of the fringe benefit system. Accordingly, the number of cards issued rose by 5 per cent between January 2020 and December 2021, and exceeded 2.2 million. An even more visible change is that the number of SZÉP cards used for transaction within one month increased by nearly 19 per cent on annual average compared to 2020. In this respect, really outstanding expansions took place in April (43 per cent) and May (36 per cent) 2021 compared to the same period of the previous year. In the summer period, in spite of the increase in the number of cards, the number of cards not used by their holders fell to below 1 million permanently. (Chart 59)

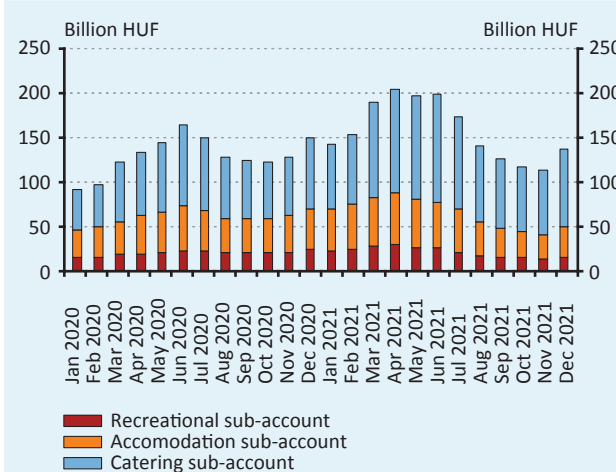
Chart 59
Number of SZÉP cards issued and their usage in a monthly breakdown



In relation to the developments in the turnover, the changes in the regulations made their impact felt strongly even irrespective of the powerful seasonal effects. Following the change in the conditions of the preferential

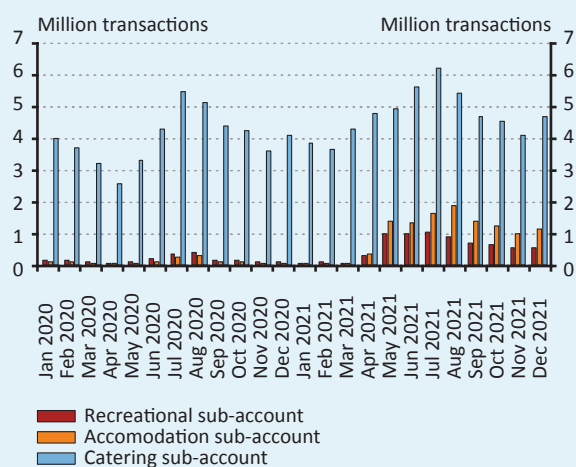
benefit, the utilised appropriation increased considerably, which is also well visible in the 24 per cent growth on annual average compared to 2020 in the monthly balance held on the cards. The size of the balance held on SZÉP cards reached its peak in April 2021, exceeding HUF 200 billion. In addition to the alteration in the size of the balance, there were major changes in terms of its distribution as well. While in January 2020 the shares of the recreational, accommodation and catering sub-accounts were 16, 33 and 51 per cent, respectively, by December 2021 they changed to 10, 26 and 64 per cent, respectively. (Chart 60)

Chart 60
Changes in the balances of SZÉP card sub-accounts and their distribution across the sub-accounts in a monthly breakdown



A major change took place not only in the balance, but also in the transaction turnover, mainly as a result of allowing complete interchangeability across sub-accounts. Compared to 2020, SZÉP card holders carried out 49 per cent more transactions a month on annual average. It is also to be mentioned, however, that while in January and February 2021 minimal declines were observed compared to the same periods of the previous year, 105 and 112 per cent growth took place in April and May 2021, respectively, and even in June 2021 an expansion of 74 per cent was realised. The peak in transaction turnover was reached in July 2021 with 9.1 million transactions. The growth is mainly outstanding on the recreational and accommodation sub-accounts, which – in addition to seasonal effects – is attributable to the permitting of complete interchangeability across sub-accounts. From the change of the structure of the turnover the conclusion that can be drawn is that consumers prefer to spend the balance held on both the recreational and accommodation sub-accounts on catering type services. (Chart 61)

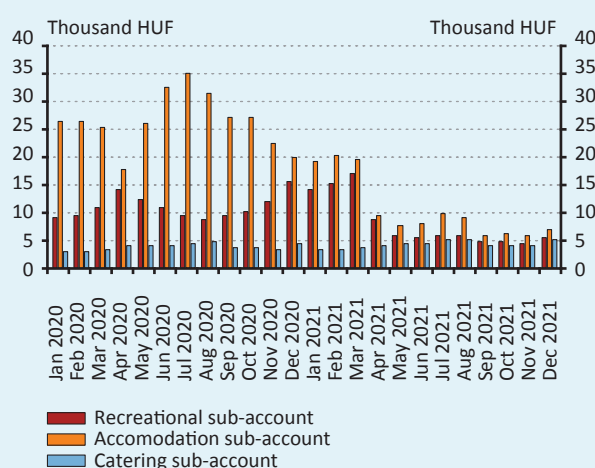
Chart 61
Transaction turnover with SZÉP cards in a monthly breakdown by sub-accounts



In parallel with the upturn in the transaction turnover, the amount per transaction also changed significantly in view of the complete interchangeability across sub-accounts.

This also corroborates that consumers prefer to use the balance held on the recreational and accommodation sub-accounts for funding typically lower-amount catering-type spending. Compared to the same period of the previous year, starting from April 2021 the value per transaction on the recreational and accommodation sub-accounts declined by 50 and 71 per cent on average, respectively. (Chart 62)

Chart 62
Changes in the value per purchase transactions by SZÉP card sub-accounts in a monthly breakdown



4.4 CURRENT ISSUES RELATED TO CENTRAL BANK DIGITAL CURRENCY AND DISTRIBUTED LEDGER TECHNOLOGY

4.4.1 Possible domestic implications of a digital euro

Central bank digital currency (CBDC) has become one of the main subjects of research of central banks in recent years, in which a major role is played by the examination of payment aspects as well. Irrespective of whether it is about the so-called wholesale CBDC (used in interbank turnover), available for the participants of the financial sector, or the so-called retail CBDC, which can be used by end-users as well, developing the financial infrastructures and the related payment solutions is necessary in any case. It is also true when we speak about the objectives behind the introduction of the CBDC, which may be expressly payment type objectives, but, for example, they may also primarily be related to monetary policy aspects.

Of the international CBDC projects, the ECB's digital euro project is of special importance for Hungary, as it may fundamentally remodel the operation of the financial sector of the euro area, and thus it may have a significant indirect effect on the domestic financial service providers as well. The ECB published its first report⁴¹ on the questions of the introduction of a digital euro in 2020. This document already determined certain basic directions, such as the thought of introducing a retail CBDC, where the basic payment services would be free of charge for the consumers. The ECB sees a great potential in the CBDC in the area of supporting the digital transition of the European economy and preserving the European sovereignty of the payments market. At the same time, the ECB also reiterated that – similarly to other CBDC projects – with the introduction of the digital euro it is not an objective to phase out cash from payments.

In 2021 the ECB announced that it would start a 2-year investigation phase in the digital euro project. The aim of the investigation phase is to identify the main decision points whose proper definition may ensure that the digital euro will be created in line with consumer expectations, while the financial stability risks related to its introduction are minimal. In addition, the investigation will cover the technological background as well, thus including the

⁴¹ https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf

possible utilisation of the existing financial infrastructures, the trying of new technologies (such as the distributed ledger technology – DLT) as well as the testing of special functions (e.g. anonymity).

A possible introduction of the digital euro may have an impact on the operation of the domestic payments sector as well. The form of the introduction of the digital euro (what infrastructure would it work on and with what message formats, what actors would it be available for etc.) may have an effect on the domestic payments market as well. If it was available for the citizens of non-euro area EU Member States as well, connection should be created between the digital euro infrastructure and the domestic forint-based payment systems. At the same time it could also entail improvements in terms of service level as well if digital euro payments had to be provided for domestic customers as well. In addition, in the case of a possible domestic CBDC project as well it would be necessary to examine how it is possible to ensure the interoperability of the domestic system with the digital euro infrastructure and payment solutions.

4.4.2 Current issues related to wholesale central bank digital currency

In the past years, international payment systems changed considerably, including an increase in digitalisation, a declining use of cash and the appearance of various crypto-assets. As a result, and in order to exploit the new possibilities offered by modern technologies, research on creating a central bank digital currency started. According to the definition of the Bank for International Settlements (BIS), CBDC is a digital form of central bank money that is different from balances in traditional reserve or settlement accounts. This difference may materialise in two ways. Firstly, with the help of modern technologies, already central banks may be able to issue a currency available even for the whole population, thus making a digital claim on the central bank balance sheet widely available. This is the so-called retail CBDC. Secondly, it is also possible to create a CBDC that is available for the financial intermediary system and other key economic agents but is based on a technology that is different from the present systems. This is the so-called wholesale CBDC.

At present, attention is focused on two technologies: distributed ledger technology and tokenisation. The essence of the distributed ledger technology is that keeping the records of accounts and balances, i.e. storing and maintaining the ledger, is done not only by a central actor, but several participants in the system store a copy of the ledger, and – depending on its settings – even the recording of transactions can be done by several actors.

A system like that may be more resilient to both incidents and cyber-attacks as the ledger is not stored at one central actor only, and – depending on the settings of the system – transactions can be recorded even if the central actor is unavailable. In addition, a DLT solution may increase cost effectiveness as well by replacing traditional infrastructures that are often complex and elaborate, and operate at high costs.

According to the participants' authorisations, DLT may be public or private and, irrespective of that, permissioned or permissionless. In the context of wholesale CBDC only a private DLT is possible, as in this situation – contrary to public solutions – it is a precondition to limit the circle of those who have access, but the necessity of the use of permissions is determined by the circle of users. If the CBDC is available only for a limited circle of banks, using a permissioned system is not absolutely necessary. In this case every participant may record transactions in the distributed ledger, and if there are differences between them, the participants decide on the validity of the transactions on the basis of a consensus mechanism. The booking of transactions is simplified in a system like this, as there is no need for the intervention of the central actor, but the central bank can still monitor the transactions, and can supervise the system and its users. At the same time, a permissioned system can be operated securely with a wider circle of participants as well, because even a cyber-attack affecting multiple actors would be unable to reach all the copies of the ledger.

The advantages offered by tokenisation could be especially important for a wider circle of participants. In a system that uses tokenisation it is not the participants' accounts and the balances on them that are recorded, but the participants possess so-called tokens, which may be currency units in the case of a CBDC but could also be other digital assets. It is relatively easy to include various new tokens into a tokenised system, which allows two significant improvements compared to the current central bank currency systems. Firstly, both central bank currency and securities may become available in the same system, reforming securities settlement, and secondly, simultaneous handling of multiple currencies may also become possible, i.e. tokens of different currencies may exist in a tokenised system at the same time. Accordingly, an international wholesale CBDC or several interconnected systems may simplify and accelerate cross-border interbank payments and foreign exchange transactions, bypassing the costly and slow correspondent banking systems.

In the area of cross-border payments, three wholesale CBDC projects are highlighted; all the three are supported by the BIS. One of them is the Jura Project, implemented

between the French and Swiss central banks. In this project, during a test in December 2021 euro- and Swiss franc-based CBDC transactions were successfully settled in a common system, demonstrating the usefulness of the technology under real circumstances. In parallel with that, transactions with a total value of RMB 2 billion (around HUF 104 billion) were conducted between countries within the framework of the Multiple CBDC Bridge (mBridge) Project going on among the central banks of Hong Kong, China, Thailand and the United Arab Emirates, supporting mostly international trade payments. Last, but not least, is the Dunbar Project, which is the joint initiative of the central banks of Singapore, Australia, South Africa and Malaysia. The objective of the project is to create a multiactor CBDC platform that allows direct clearing for central banks and commercial banks using the CBDCs issued by the participating central banks.⁴² In addition to the Banque de France, the MNB also joined this innovative project as an observer.

4.4.3 DLT innovations in securities market infrastructures

More and more innovative digital solutions appear also regarding securities infrastructures, and here as well the primary objective is an increase in operational efficiency. At present, technological conditions that make interinstitutional and cross-border operations more difficult are among the main factors that limit efficiency. This is an even greater issue in the case of securities settlement due to the number of institution types: while payments affect only central bank payment systems and their participants, stock exchanges, central counterparties, central securities depositories, issuing companies, investment firms and banks are also concerned by the operation of the securities market. Securities settlement fees are naturally high due to the length of value chains, and this is even more true in an international dimension. Accordingly, the current innovations – especially the improvements based on distributed ledger – focus on reducing the number of intermediaries and increasing the efficiency of the reconciliation processes.

It matters which securities market segment the DLT- or blockchain-based innovation comes from, as market participants wish to achieve partly different targets than central infrastructures. Market participants mostly want to use the distributed ledger systems for bypassing the present central infrastructures, thus saving the related costs. Central infrastructures, in turn, would use DLT technology to improve their transparency and reconciliation processes, thus reducing their fees. There are international projects

in both segments, but the question is which direction will dominate in the long run. In connection with this it has to be taken into account that the infrastructure market is especially characterised by economies of scale and extensive regulatedness, and for the time being this benefits traditional infrastructures as opposed to the systems set up by market participants. Nevertheless, there are regulatory initiatives, such as the European draft regulation on the markets in crypto-assets and the European draft regulation on a pilot regime for DLT-based market infrastructures, which want to change this situation, so the long-term effect of innovations is unpredictable for the time being.

Of the ongoing projects those infrastructural cooperations are of special importance where innovative solutions are planned to be developed in the areas of both money side and securities side processes. There are initiatives that wish to apply the new technologies in connection with both the cash and securities legs of delivery versus payment (DVP) type transactions, thus making full programmability of securities transactions possible. In practice this would mean the exchange of a digital financial asset, such as tokenised equity, against central bank digital currency. In this case, digital transition is needed not only on the central bank's side, but also on the side of the central securities depository that keeps record of the equity. Moreover, the stock exchange serving as the trading venue of the financial asset may also be concerned. Accordingly, a Hungarian initiative like this would require the close cooperation of the MNB, the Budapest Stock Exchange (BSE) and KELER. The Swiss infrastructure group (SIX) may serve as an example, as the SIX Digital Exchange (SDX), which is being set up, and the Swiss central bank conducted successful tests within the framework of the so-called Project Helvetia regarding the settlement of digital financial assets against central bank digital currency.

In addition to comprehensive digitalisation improvements, also especially important are the ones that focus on certain partial tasks of securities settlement, i.e. on modernising corporate action processing or on increasing operational availability. In addition to basic securities settlement processes, distributed ledger technology can be used in other post-trading processes as well, of which the so-called 'asset servicing' activities, which support the events arising when holding financial assets, are of key importance. For example, they include activities that allow the identification of the end investors of a given share, the arrangement of corporate events related to the share (such as dividend disbursement), shareholders' electronic voting during general meetings or the automation of the

⁴² For more details see the report of the Dunbar Project: <https://www.bis.org/publ/othp47.pdf>

taxation related to shareholder incomes. It is important that the identification of end investors, communication with them and the organisation of payments to them ultimately constitute IT tasks, and the secure information sharing allowed by DLT may be applied in order to support them. Accordingly, it is worth to take DLT into account also in connection with the modernisation of securities market sub-activities, since a project with a narrower focus may be completed within a shorter time, but may still result in a significant increase in efficiency. In addition, the clearly IT-type use cases, which use the DLT for database side and cyber security improvements, also need to be highlighted. In these cases the distributed ledger primarily supports the secure sharing of data among users, and ensures that the outage of a given ledger node does not cause any disruption in the operation of the infrastructure.

The MNB monitors the trends of securities market innovations and the related European legislative initiatives, and is ready to participate in digitalisation initiatives coming from the market and the financial infrastructures. The MNB examines at expert level what digitalisation improvements would be useful for the Hungarian securities market on the side of the financial infrastructures owned by the central bank. The advancement of distributed ledger technology and the adoption of related European legislation may result in an environment where important digitalisation possibilities may open for the Hungarian market as well.

4.5 CURRENT PSD2 ISSUES

The second European Payment Services Directive (PSD2), which determines the foundations of payment services and significantly restructures their conditions, set numerous economic and consumer protection goals as well as ones aiming at the increasing of the security of payments, with the related rules entering into force continuously. The Directive itself has been effective since January 2016, its application in Hungary started in January 2018. A major step was the launching of open banking in September 2019 and the introduction of the rules related to online bank card payments in January 2021. The objectives of the PSD2 include, inter alia, the boosting of competition and innovation as well as bringing new payments actors into being through the common regulation of access to payment accounts and the creation of open banking. Increasing the security of online payments, introduction of strong customer authentication as well as application of state-of-the-art fraud prevention methods in order to prevent and mitigate the losses caused by frauds. A further objective of the PSD2 is to create strong and efficient customer protection through increasingly strict liability rules, single consumer complaint management and the single European regulation in general.

For achieving the objectives of the PSD2, the MNB attaches great importance to the controlling of the related statutory provisions and full compliance with them. In 2021, the last details of the PSD2 rules were also introduced, and thus the five-year process of entry into force of the new payment rules came to an end. Nevertheless, further steps are also needed in order to achieve the goals of the PSD2. In addition to continuous inspection, provision of information and customer education, fine-tuning of the details of the rules may also become necessary, and the MNB attaches great importance to these tasks.

4.5.1 Presentation of the rules of exemption from strong customer authentication of online bank card payments

The application of strong customer authentication has been mandatory in the case of online bank card purchases as well since 1 January 2021. Pursuant to the new rules, the application of strong customer authentication, which serves the protection of customers, is mandatory not only in the case of electronically initiated credit transfers, but also in the case of online purchases by bank card. By the simultaneous use of authentication elements falling into two categories that are independent of one another (knowledge, possession, biological trait), strong customer authentication serves the protection of buyers (customers) who use the payment service. Practically it means, for example, that for an authentication related to online purchasing by bank card it is necessary to simultaneously know a static password as well as a code that can be used once, which, for example, is received in a text message to a mobile phone. Although this major change has become a part of our everyday life, the application of exemption rules, i.e. when authentication elements are still not required, may still be unusual for many customers.

In certain cases it is possible to refrain from the application of strong customer authentication, and these cases are described in detail in various exemption rules. The law precisely defines the cases when the payment service provider is allowed to apply exemption rules. The list of these exemption rules is contained in the SCA and CSC, and thus the same exception rules may be applied in every EU Member State. The EU legislator included the exemption rules in the regulation to accelerate the payment process in certain cases that are considered as low-risk ones.

In connection with the exemption rules detailed below it is important to know that payment service providers may decide on their application individually, and therefore there may be differences between the practices of account providers. A rule like that is the case of low-

value transactions, i.e. the ones below a forint amount corresponding to EUR 30. Namely, in this case the payment service provider may decide not to apply strong customer authentication. An extremely flexible rule is the exemption rule based on transaction risk analysis. Referring to that, the account provider may also decide up to a forint amount corresponding to EUR 500 (but not above that amount) not to apply strong customer authentication, but in this case other strict conditions also have to be met, e.g. it has to operate a real-time fraud monitoring system, with which the payment service provider is able to continuously detect any possible (attempted) frauds. Another frequently applied exemption rule is the one concerning recurring transactions. Cases of exemption like that may be the recurring payment transactions (such as subscription fees, subscriptions to magazines or other media service providers that provide popular media services), when during online shopping our account would be debited by the same amount at regular intervals. In this case our bank may apply the exemption rule for recurring payments, so it is sufficient to apply strong customer authentication only upon the first debiting.

In the case of the exemption rule concerning trusted beneficiaries, strong customer authentication does not have to be applied to beneficiaries that are on a list. Customers here may mark the final beneficiaries of the payment transaction they initiated as ‘trusted’ even through the netbank, and thus it is not necessary to apply strong customer authentication in these cases either. In the case of a ‘trusted’ beneficiary it is especially important to emphasise that only the payer, i.e. the customer can decide what beneficiaries he wishes to mark as trusted; the payment service provider is not entitled to do that. At the same time, there may be various customer-friendly solutions. For example, the customer himself registers or may select from a list the beneficiaries he considers trusted on the Internet banking interface of the payment service provider that holds his payment account. Another customer-friendly solution may, for example, be when the payer initiates an online purchase with his payment card, during which the strong customer authentication is applied upon the first payment order, then the payer is automatically offered the option of including the given partner among the trusted beneficiaries. In addition, exemption rules are also related to traffic and parking. Strong customer authentication is also not needed when a payment transaction related to transport fare or parking fee is initiated on an unattended terminal (such as a parking meter).

Nevertheless, if no strong customer authentication takes place for any reason, as a general rule, the account provider is liable for damages. It is very important to emphasise that if no two-step authentication takes place during the transaction either with reference to the above exemptions or due to any other reason, the liability rules related to payments become even stricter. In cases like that, the account provider of the customer will be fully liable for the damage stemming from the lack of strong customer authentication.

4.5.2 Amending the rules of strong customer authentication

Open banking, the great innovation of the PSD2, has so far been unable to fully achieve its targets of stimulating competition and supporting innovation. Therefore, proposals to amend the rules of open banking arose. The second European Payment Services Directive (PSD2) and the regulation containing its regulatory technical standards (SCA and CSC⁴³) allowed new market participants to build innovative services on the basis of customers’ account information data (such as account history). These new players are called account information service providers. Market participants outlined a number of problems in connection with the current practice of open banking at the event⁴⁴ held with the participation of market players and the competent working group of the European Banking Authority (EBA) in June 2021. A major issue was a package of proposals to amend the rules, which is expected to provide significant support to account information service providers in providing their services in an efficient manner.

The current rules may allow a special, 90-day exemption from strong customer authentication for account information service providers. Article 10 of the SCA and CSC allows the account provider not to apply strong customer authentication (SCA) each time if the customer has access only to a limited scope of account information (account balance and/or recent account history) through an account information service provider, and less than 90 days elapsed since the last strong customer authentication related to the access. However, this exemption from strong customer authentication is only a possibility, not an obligation.

European experiences obtained in the first years of the application of the SCA and CSC showed that in terms of the special exemption the voluntary nature of the exemption led to very different practices, for the solution of which

⁴³ Commission Delegated Regulation (EU) 2018/389 of 27 November 2017 supplementing Directive (EU) 2015/2366 of the European Parliament and of the Council with regard to regulatory technical standards for strong customer authentication and common and secure open standards of communication

⁴⁴ EBA Industry Working Group on APIs under PSD2

the European Banking Authority initiated amendments to the SCA and CSC. Some account providers requested SCA every 90 days, some did it at shorter intervals, while a third group required SCA for each access to the account. This had a negative impact on the customer experience of account information service providers' services. Moreover, this practice even made certain automated services related to personal finance management (PFM services) impossible in some countries. In order to solve these issues, the European Banking Authority (EBA) came to the conclusion that further harmonisation was needed in relation to the exemptions from the SCA, and on 5 April 2022 it adopted and published on its website a proposal to amend the SCA and CSC.⁴⁵

The essence of this amendment is the introduction of a new mandatory exemption from the SCA as well as the increasing of the 90-day exemption to 180 days. The new exemption would apply only to that special case of use when access is through an account information service provider, and only if the conditions determined in the draft amendment to the RTS are met. In addition, the amendment contains the limitation of the effect of the voluntary exemption under Article 10 of the previous SCA and CSC for the event when the customer has access to the account information directly through the account provider (e.g. the displaying of the balance in mobile bank without SCA – this would remain optional in the future as well). Another major amendment contained in the plan would increase the renewal deadline for SCA from 90 days to 180 days both in the cases when the customer has access to his account information through an account information service provider as well as directly through the account provider. The open consultation of the proposal concerning the above amendment to the SCA and CSC attracted extremely strong interest, and the EBA received numerous (1278) feedbacks to its questions related to the amendment, most of them supporting the amendment.

The MNB had always treated the achievement of the innovation and competition boosting objectives of the PSD2 as priorities, and thus it supported the above draft amendment to the SCA and CSC. The above problem has not occurred in large numbers in Hungary. Hungarian account providers typically ensure the 90-day exemption from SCA for the customers of new market participants pursuant to Article 10 of the SCA and CSC as well, but the MNB can see that the proposed amendment points to market improvements related to open banking, and may contribute to the achievements of the objectives of the PSD2.

4.5.3 Experiences with API inspections

The MNB attaches great importance to the controlling of the statutory provisions related to open banking and to the full compliance with them. Therefore, it took several steps last year. Firstly, within the framework of an examination of the sector, from the technical side it started the inspection of the application programming interfaces (API) implemented by account servicing payment service providers. Secondly, the MNB issued a recommendation⁴⁶ in connection with the obstacles of third party providers (TPP) that use banks' API. In addition to the above, the MNB initiated consultation in order to facilitate the communication and cooperation between banks and TPPs, and intends to regularly maintain this practice entitled 'API round table discussion' in the future.

Deeper examination of the sector than the regular payment inspections has become necessary for the controlling of the quality and functionality of the APIs. The MNB formulated its expectation for the first time in 2020 that for full compliance with the requirements pursuant to the PSD2 and the related legislation, in addition to the usual compliance type inspections it is necessary to inspect the APIs implemented by banks from the technical side as well. Examinations of the live APIs could start in 2021 H2, during which the inspections of four banks were started simultaneously in the first round.

The inspections primarily focus on checking the meeting of the expectations under Articles 30–36 of the SCA and CSC. When controlling the APIs, attention is paid to the technical expectations formulated in the aforementioned articles as well as to the compliance expectations that prove the compliance of the technical expectations. The inspection covers the examination of the congruency of the implemented live and test systems as well as the adequate documentation of the APIs. When checking the obstacles experienced during the implementation of APIs we examine the cases detailed in the related MNB recommendation, and we also examine the adequacy and quality of the communication between banks and TPPs. The examination also covers the checking of the further existence of the exemption from the contingency mechanism provided by the MNB earlier, the appropriateness of APIs and the management of the changes taking place in their environment as well as the rule concerning their indication in time. A so-called snapshot is examined during the technical inspections. In addition to exploring the current deficiencies, one of the experiences of the inspections is that at the current level of development of open banking

⁴⁵ <https://www.eba.europa.eu/eba-publishes-final-report-amendment-its-technical-standards-exemption-strong-customer>

⁴⁶ Recommendation No 10/2021. (VII. 1.) of the Magyar Nemzeti Bank

the snapshot-like deep technical inspection is a necessary tool, which is a suitable complement to the regular payment inspections. Nevertheless, it is possible that with the development of the market the next step should be taken towards a tool that allows the continuous monitoring of APIs but examines fewer requirements and less deeply.

4.6 INTERNATIONAL TRENDS IN REGULATION

4.6.1 Planned changes in the regulation of electronic authentications and signatures (eIDAS Regulation)

There is significant potential in the application of electronic authentication and signature solutions in the area of payments, for the exploitation of which there have been numerous initiatives at European level as well. Both the ECB's and the European Commission's (Commission) retail payments strategies expressly call attention to the possibilities of electronic identification (eID) solutions in payments. With these solutions, customers may become able to participate, for example, in onboarding and customer identification (KYC) processes or approve payment transactions in a comfortable manner, without using paper-based documentation. At the same time, on the payment service providers' side it may result in cost saving if the typically manual, paper-based processes are replaced by digital solutions. This is supported by the 2014 European eIDAS Regulation⁴⁷ as well, determining basic rules of operation in this area.

The currently effective eIDAS Regulation can support the spreading of eID solutions only in a limited manner. The Commission's assessment established that the current regulation has various deficiencies that prevent the wide-ranging use of eID solutions. One of them is that the regulation focuses on the public sector, and thus the involvement of market participants materialised only at a low level. In addition, consumers do not have the opportunity to entirely determine the scope of shared data and of those who have access to them. Moreover, the acceptance of eID solutions is extremely limited both in domestic and cross-border terms.

In 2021, the Commission submitted a regulatory proposal to address the current deficiencies and spread the use of digital identity. The main element of the proposal⁴⁸ submitted by the Commission would be the mandatory, member state level introduction of a mobile wallet in which consumers could securely store any of their

certificates, identification documents or attributes in a digital format, and would be able to share them with others online and in the physical environment as well. In addition to the fact that the above in itself could greatly contribute to the digitalisation of the European economy, it may create numerous new opportunities for payment service providers as well, for example for formulating the customer authentication processes in a comfortable as well as internationally interoperable manner.

4.6.2 Regulatory developments related to the individual elements of the Commission's digital financial package

The European Commission published its digital financial package in 2020, one of the main objectives of which is to create an agile regulatory framework that adjusts to the steadily changing environment, contributing to the competitiveness of the financial sector of the EU by this as well. Accordingly, the Commission's package also contains a single draft legislation concerning the increasingly spreading crypto-assets and distributed ledger technologies. In addition, in order to protect the end users of digital financial services and ensure the integrity of the financial sector of the EU, the Commission also made a proposal for working out a new regulatory framework that would facilitate the strengthening of digital operational resilience. Within all that, the DORA, which aims to promote the cyber security of financial services and the management of operational risks in a wider sense, contains provisions concerning the increasing of the IT security of financial enterprises, additional data reporting obligations, supervisory cooperation and the oversight of third party information and communication technology suppliers. In view of the arising consumer protection risks, the MiCA formulates uniform reporting, consumer protection and supervisory rules regarding the issuing and trading of crypto-assets. At present, the draft regulation serving the adequate legislation of activities related to crypto-assets is in front of the European Parliament and the Council. At the same time, the draft regulation related to market participants (such as investment firms, central securities depositories) obtaining the right to operate multilateral trading and securities settlement systems based on distributed ledger technology (DLT) contains provisions regarding the conditions of application and operation of the distributed ledger technology and also the permission and supervision of their use as well as the cooperation between national and European authorities. The text of the draft regulation is being finalised.

⁴⁷ Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC

⁴⁸ https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-digital-identity_en

King Louis I ('the Great')

(5 March 1326, Visegrád – 10 September 1382, Nagyszombat)

King of Hungary (1342–1382) and Poland (1370–1382) from the House of Anjou.

His reign is considered to be one of the golden eras in the history of the Medieval Hungarian Kingdom: peace at home and dynastic relationships abroad facilitated social, economic and cultural development and narrowed the gap between Hungary and Western Europe. Louis' active diplomacy and military campaigns also elevated Hungary to become one of the great European powers. The personal qualities and victorious battles of the 'knight king' inspired even the poets of 19th century Hungarian romanticism.

Louis was the son of Charles I of Hungary and Princess Elizabeth Łokietek of Poland. His versatile education matched his status as crown prince. In addition to law, history and politics, his tutors from the ranks of the clergy also introduced him to theology and the seven liberal arts (grammar, dialectic, rhetoric, arithmetic, geometry, astronomy and music) as well as knightly skills. Following his father's death, he was crowned at Székesfehérvár on 21 July 1342, with uniform approval of the aristocracy.

Louis inherited a healthy state treasury, a stable and seamlessly operating state administration and also enjoyed the backing of talented and loyal aristocrats, who were ready to help the young monarch realise the foreign policy objectives he set out in his pledge made at Nagyvárad. He was deeply religious and a fine example of a knight, and he used an iron hand to govern his empire. He was a devout Christian and a champion of the Church even though the clergy did not always serve the king's interests.

Basically, Louis ruled the land in harmony with the aristocracy; yet, he also tried to win the support of the lesser nobility. His laws codified in 1351 remained in force until 1848 and served as the backbone of the nobility-based constitutional system. One of such laws was the confirmation of the Golden Bull of 1222, which, one and a half centuries after it was issued, had become a fundamental law of noble privileges. Among others, this piece of legislation declared that all nobles enjoyed 'one and the same liberty' (in Latin: 'unus eademque libertas'), thereby granting equal rights to all members of the noble class. Another key piece of legislation was the Law of Entail, which, among other provisions, ruled that if the family line died out completely, the estate reverted to the Crown. (Even though the Golden Bull permitted free inheritance, it never became general practice; thus, the king only documented the status quo.) In the latter years of his reign, King Louis implemented a number of reforms in the state administrative and the judicial systems.

At the request of the pope, Louis often led his army 'to protect the one true faith' against pagan Lithuanians, heretics (the Bogumil) or orthodox Christian South Slavs. His reign was also marked by a number of campaigns to Italy, Dalmatia, Lithuania and the Balkans. These wars took a heavy toll on the country's political, financial and military capacities but the state government stabilised by Louis' father successfully passed all these tests. The Kingdom of Hungary had become a true European great power ('Magyar Archiregnum') during Louis' reign. In addition to his immediate interests, Louis the Great's diplomatic efforts also targeted a number of European states; no Hungarian ruler before or after him had ever practised such an active foreign policy. Spared from domestic struggles and foreign attacks, Louis' reign enabled the country's development both in terms of politics and economics.

PAYMENT SYSTEMS REPORT

June 2022

Print: Prospektus Kft.

H-8200 Veszprém, Tartu u. 6.

mnb.hu

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