



PAYMENT SYSTEMS REPORT



2020

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

King Louis I. (‘The Great’)



PAYMENT SYSTEMS REPORT

2020

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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 2 July 2020. Contributors: Gergely Balla (editor-in-chief), Zita Bárdits, László Bodnár, Judit Brosch, Beáta Csapó, Péter Császár, Árpád Cseh (editor), Vivien Deák, Fanni Fördös, Brigitta Gábrriel-Lajos, László Kajdi, Milán Kiss, Eszter Kozma, Miklós Luspai (Head of Department), István Nemecskó, Cecília Pintér (editor), Dániel Rácz, Miklós Sallai, Gábor Sin, Kristóf Takács, 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 7 April 2020 and 2 July 2020, and at the Monetary Council meeting on 23 July 2020.

The MNB staff relied primarily on information relevant to 2019, although looking forward the Report also analyses ongoing developments observed in the course of 2020.

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1 Executive summary

DOMESTIC PAYMENT SERVICE DEVELOPMENTS

The improvement of the electronic payment infrastructure and the penetration of digitalisation continued in Hungary in 2019 as well. The number of payment accounts accessible online came close to 8.4 million, the number of payment cards issued in Hungary reached almost 9.4 million, while the number of cards registered in mobile wallet applications was close to 0.5 million. In addition, the number of virtual merchant outlets and POS terminals operating at physical merchant acceptance points also increased: the first came close to 13,000, while the latter to 150,000. In terms of the further development of the electronic payment infrastructure it should be emphasised that from 1 January 2021, the vendors that use online cash register on a mandatory basis will be obliged to provide the option of electronic payment, and thus cashless payment will be available also where it has not been offered before. This is also supported by the introduction of the instant payment service from 2 March 2020, which – by expanding the possibilities of using credit transfers – created the basis for the development of easily usable and innovative payment solutions.

In parallel with the improvement of the infrastructure, the number of electronic payment transactions also increased; the driver of the growth in 2019 was also provided by the increase in payment card purchases. The number of electronic payment transactions rose by 15 percent compared to 2018 and exceeded 1.4 billion, from which payment card purchase transactions accounted for almost 1 billion. Major growth was registered also in the area of card-based innovative payments and credit transfers: the number of payment card transactions executed through mobile wallet applications quadrupled, while the number of credit transfers rose by almost 7 percent. Although, based on the database of the online cash registers, the ratio of cash transactions within retail payments is still around 80 percent, electronic solutions gain increasing ground. Owing to this, in 2019, Hungary came closer to the EU average in the area of electronic payments of purchases.

Hungarian banks apply high prices in a complicated structure for their credit transfer services, even though the wide-ranging spread of package priced payment account products could significantly foster the penetration

of electronic payments. The MNB examined the pricing of payment services in Hungary in 2019 and also at the beginning of 2020, and found that the costs related to payment services of Hungarian retail customers as a percentage of their income can be considered high in a European comparison, and the complexity of domestic pricing structures complicates the comparison of various payment account products. Since this hinders the dynamic growth in terms of the spread of electronic payment solutions, in 2019 and 2020 the MNB formulated several times the expectation towards Hungarian payment service providers to provide their customers with credit transfers in unlimited number and amount for a low monthly account-management fee without charging separate transaction fees. The need for this measure is well illustrated by the fact that in 2019 the banking sector's revenues from payment services rose by 10.3 percent, and the payment card acceptance costs of small retailers remained at a high level.

In 2019, the MNB completed 9 regulatory payment inspections, and imposed payment penalties in the total amount of HUF 135.8 million. The general experience gained from the completed payment inspections is that the operation of the inspected payment service providers is essentially adequate, nevertheless, there are irregularities in all cases. The most frequent error is the failure to credit the payment transactions immediately, followed on the second place by the omissions linked to the rectification of payment transactions and by the omissions of providers related to the liability and compensation rules. The focus of the inspections in 2019 was on the audit of the rules of the new European payment services directive (PSD2), to which special attention will be paid in the future as well: in 2020, the MNB will inspect the proper functioning of the application programming interfaces (APIs) prescribed by PSD2.

The number of frauds and malfunctions in electronic payments remained low in 2019 as well. In the first three quarters of 2019 the ratio of payment card related frauds to the total number of card transactions was 0.006 percent, which represents a ratio of 0.012 percent in losses relative to the total turnover. Although the volume of card frauds is negligible, they typically emerge in the case of online purchases, and particularly cross-border transactions. The number of electronic payment frauds not related to cards was merely 52. In addition, the number of payment

malfunctions may be also deemed low compared to the complexity of the infrastructure. In 2019, the MNB was informed of 442 incidents, the elimination of which took 12 hours on average. Almost 40 percent of the incidents were linked to the internet banking systems.

DOMESTIC PAYMENT AND SECURITIES INFRASTRUCTURES

VIBER (RTGS), the payment system operated by the MNB, operated with high reliability in 2019 as well, and it registered a growth of 11 percent in the number of transactions compared to 2018. In 2019, the VIBER turnover amounted to HUF 1,515 billion and the full outage of service occurred in the system was merely 192 minutes. Settlement risk proved to be low throughout the year, while liquidity was sufficient both at systemic level and on an individual bank basis. The total amount of forint transactions in the international CLS system, connected to VIBER, rose by 48 percent, which means that it was possible to process more foreign exchange transactions without settlement risk than in 2018.

The Interbank Clearing System (ICS), operated by GIRO Ltd, worked reliably in 2019, and the number of cleared transactions rose by 6.8 percent compared to 2018. In 2019 the ICS turnover amounted to HUF 127,000 billion. The availability ratio of overnight and intraday clearing was below the expected level in two months, and thus the service continuity risk rose at both clearing systems. On the other hand, it should be emphasised that the central infrastructure of instant payments went live on 1 July 2019, thereby providing the opportunity for the trial of the service, which lasted until the launch on 2 March 2020.

The securities settlement system, operated by KELER Ltd, worked with high reliability in 2019, and the number of settled transactions rose by 8 percent compared to 2018. In 2019, KELER Ltd. settled transactions in the total amount of HUF 230,000 billion, and the availability level exceeded the expected value every month. The settlement risk of transactions declined, and the amount of failed settlements fell compared to 2018. In addition, it should be emphasised that the company has taken significant steps to obtain the CSDR licence necessary for its operation as a central securities depository, and also in the area of IT modernisation, which commenced at the end of 2018.

KELER CCP Ltd, the Hungarian capital and energy market central counterparty, operated with high reliability in 2019; however, the number of capital market transactions cleared fell by almost 5 percent compared to 2018. In 2019, KELER CCP cleared transactions in the total amount

of HUF 7,700 billion, and its availability level was below the expected value only in one month. The risk of late delivery decreased compared to 2018, and for the management of its general clearing membership risks the company introduced new procedures. It should be noted that KELER CCP has become a dominant actor in the energy market of the Central and Eastern European region in recent years, and thus energy market transactions also represented a substantial share in its portfolio in 2019. It is also due to this fact that in 2019 the company started to develop its settlement bank relations, as a result of which it plans to cooperate with further three institutions.

SPECIAL TOPICS

On 2 March 2020, the Hungarian instant payment service was launched successfully, which is the start of a new era in domestic payments. Thanks to the cooperation of the MNB, the Hungarian ACH (GIRO) and the Hungarian banking sector, as well as the major, coordinated work performed in the past years, the instant payment service was launched smoothly. It is an outstanding result also by international standards that in Hungary, owing to the regulation by the MNB, all banks and other payment service providers introduced the service simultaneously, which is mandatory for electronically initiated credit transfers below HUF 10 million. As a result of this, credit transfers executed in a matter of seconds 24 hours a day on 365 days of the year has become the new norm for all customers with a domestic payment account, and already in the first three months HUF 3,800 billion was settled in the new regime. However, there is still plenty of room for the development of instant payments, and thus the MNB actively supports the introduction of interoperable innovative payment services, the use of secondary payment account identifiers and the development of market solutions based on the request-to-pay service. In addition, the MNB expects the banking sector to pay special attention to the prevention of fraud attempts also in respect of instant payments.

PSD2 contributes to the more efficient protection of customers and to the market entry of new payment service providers, and the banking sector must prepare for the application thereof. PSD2 prescribes the introduction of strong customer authentication, i.e. two-factor authentication, in order to enhance the security of electronic payments. This was already in place in the domestic credit transfers, but in the area of e-commerce payments carried out by cards the sector needs to take further measures by the end of 2020. In addition, the provision of third-party service providers with application programming interfaces (APIs) must be also improved, since the MNB experiences shortcomings in this area. The presence of new third party

service providers in Hungary is negligible, but a competition has commenced among the Hungarian banks in this area.

From an international perspective it can be observed that the penetration of fintech service providers in the payments sector is unstoppable, and an increasing number of central banks examine the possibilities related to central bank digital currency. The new fintech service providers mostly appear in the area of payments, and thus it is a must for the traditional banking actors to focus on the enhancement of their competitiveness. The fact that the instant payment service is being launched in an increasing number of countries provides assistance in this. It can be observed in Hungary as well that an increasing number of innovative actors appear primarily in the area of cross-border payment services, mobile payment solutions and the issuance of electronic payment instruments, which generates fierce competition for the banking sector. In addition, due to – among other things – the payment

aspects, and thus also in view of the pressure from the various fintech and bigtech actors, an increasing number of central banks assess the various forms of central bank digital currency and the possibilities of the potential introduction thereof.

The Hungarian financial market infrastructures are well-prepared for the management of the impact of the coronavirus on the payment and securities turnover, and for the growth in the diversion to electronic payment methods. On 20 March 2020, the MNB called upon the sector to raise the limit in terms of the mandatory PIN code entry in case of contactless payment card purchases from HUF 5,000 to HUF 15,000, which later on was also confirmed by a Government Decree, thereby reducing the risk of spreading the virus. In addition, the operators of the systems owned and overseen by the MNB took important measures to maintain their key role in the economy while preserving the health of their employees.

2 Domestic payment service developments

2.1 DEVELOPMENT OF ELECTRONIC PAYMENTS

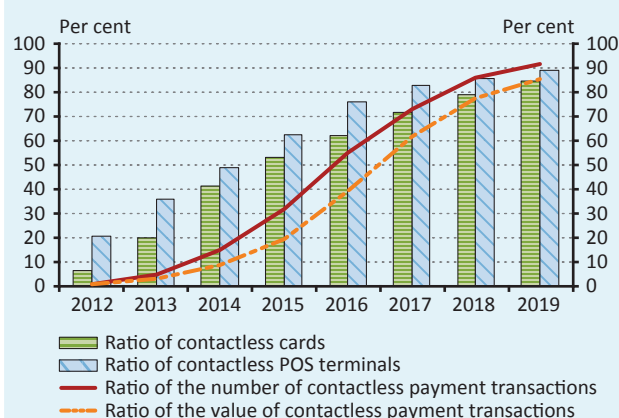
2.1.1 Improvements in the electronic payment infrastructure

The development of domestic payment services was characterised by the continuing spread of digitalisation in 2019: strong growth was registered in the number of accounts accessible online, contactless cards issued in Hungary and cards registered in mobile wallet applications. In 2019 no major change occurred in the number of accounts held primarily for payment purposes, which amounts to 6.7 million; at the same time, it evidences the dynamic penetration of digitalisation that as a result of an increase of 331,000 in the number of accounts accessible online, their number came close to 8.4 million. As a result, their ratio within the total number of payment accounts exceeded 80 percent, representing a growth of 4.5 percentage points compared to the end of 2018. This is an extremely favourable development in respect of the instant payment service, revolutionising the electronically initiated credit transfers, and thereby the entire domestic payment services, available since 2 March 2020. In addition to the foregoing, the number of payment cards issued in Hungary increased by more than 133,000 in 2019, as a result of which it came close to 9.4 million by the end of the year. Within the payment cards, following a growth of almost 9 percent, the number of contactless cards came close to 8 million. As a result, their ratio within the total number of payment cards reached 85 percent, representing a growth of 5.8 percentage points compared to the end of 2018 (Chart 1). In parallel with this, as a result of the penetration of innovative services built on the payment card infrastructure, the number of cards registered in mobile wallet applications offered by domestic payment service providers soared; due to the growth of almost 320 percent, their number exceeded 420,000 by the end of 2019. All this clearly evidences the headway of digitalisation, covering almost all areas of everyday life, as well as the rise in consumers' openness towards innovative electronic payment solutions, which can be used easily and conveniently.

The spread of electronic payment services also appeared in the domestic payment card acceptance infrastructure:

the number of virtual merchant outlets and POS terminals rose considerably. There was a negligible decline, hardly exceeding 1 percent, in physical merchant acceptance points, belonging to the payment card acquiring network of the domestic payment service providers; accordingly, at the end of 2019 their number remained below 114,000. At the same time, this value is distorted by the expansion of non-resident service providers – with no reporting obligation to the MNB – in Hungary, which offer cross-border payment card acquiring services and operate POS terminals in Hungary in an increasingly wide range, which does not appear in the presented range of data. At the same time, the number of virtual merchant outlets belonging to the domestic acquiring networks grew by more than 10 percent and came close to 13,000, which made a vast contribution to the rise in card-not-present online purchase turnover. In addition, the number of POS terminals operating at physical acceptance points rose by more than 2 percent, and at the end of the year exceeded 147,000. At the end of 2019, contactless payment was supported by 89 percent of the POS terminals – 131,000 pieces of equipment – representing a growth of 3.5 percentage points compared to the end of 2018. (Chart 1)

Chart 1
Spread of contactless payment card technology in the Hungarian payment card system (2012-2019)

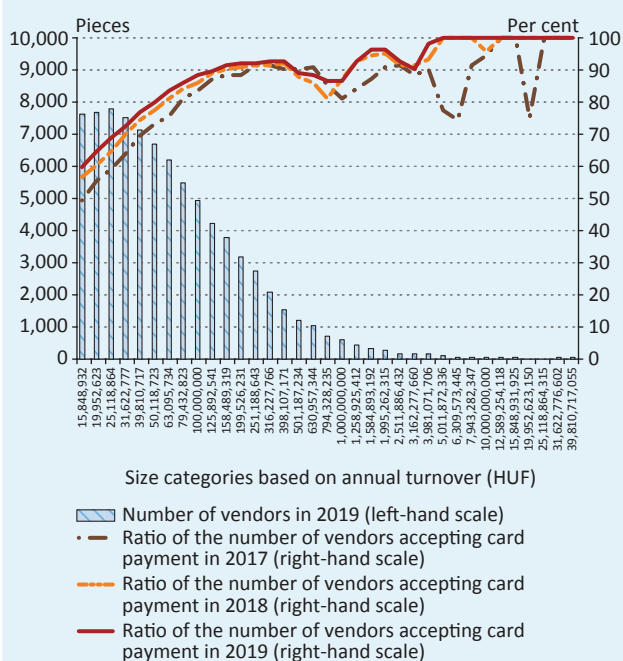


The penetration of card acceptance is constantly increasing among the shops obliged to use an online cash register¹. As regards the turnover of vendors – starting from the category

¹ Vendors include not only the physical merchant units, but also other units, belonging to the service sector, obliged to use an online cash register (e.g. catering units, accommodation service units, service stations, taxi).

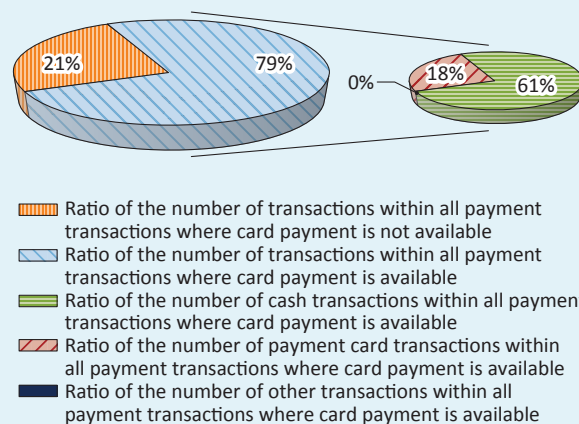
of around HUF 16 million, relevant in terms of size – the ratio of card acceptance improved in almost all categories in 2019. At the same time, it remains valid that the larger the annual turnover of a business, the higher the probability of card acceptance. While in the category of roughly HUF 16 million annual turnover it hardly reaches 60 percent, above HUF 100 million it comes close to or even exceeds 90 percent, while above HUF 5 billion it is 100 percent. (Chart 2)

Chart 2
Number of vendors with online cash register on a logarithmic scale based on turnover size categories and ratio of card acceptance in the individual categories



The fact that after 1 January 2021 those obliged to use online cash register will have to provide the option of electronic payment, may exert considerable positive effect on the further penetration of electronic payments. Based on the 2019 data of the database of online cash registers, roughly 52 percent of the almost 120,000 taxpayers obliged to use online cash register provided customers with card acceptance in shops belonging to their interest, of which it is clear that in a major part of the payment situations primarily only cash payment was available. The statutory requirement related to providing the option of electronic payment on a mandatory basis will bring a major change in this respect from 1 January 2021. In 2019, 79 percent of transactions occurred in a payment situation where card acceptance was available to the customer, and thus the legislative change is expected to have a positive impact on the remaining 21 percent. (Chart 3)

Chart 3
Card acceptance statistics based on the database of online cash registers (2019)

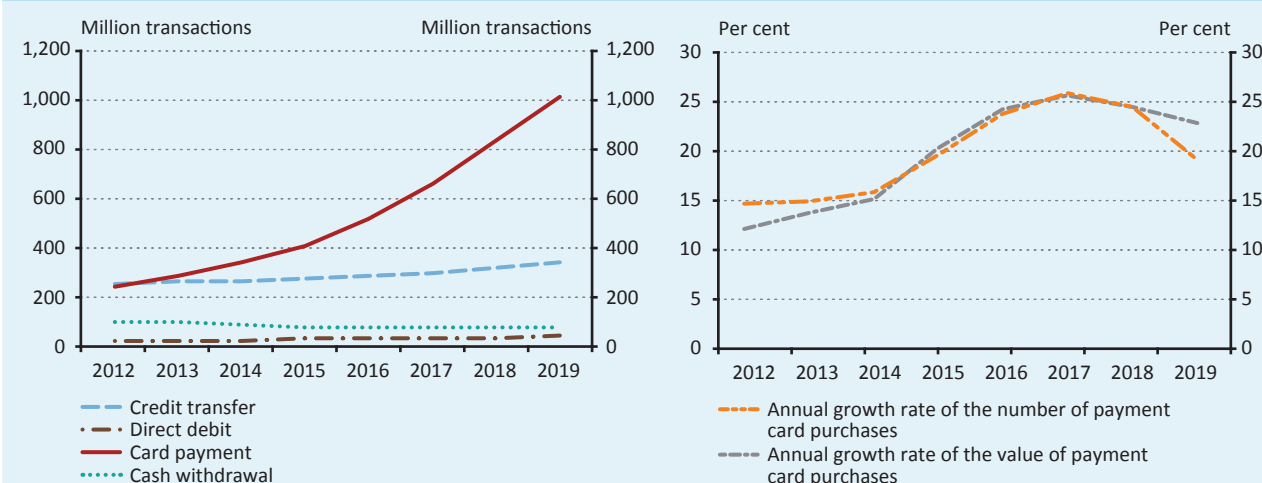


2.1.2 Penetration of electronic payment transactions

In addition to the development of the payment infrastructure, the steady growth in the number of domestic electronic payment transactions continued in 2019, with the payment card purchases continuing to be the main driver. In 2019, the number of electronic payment transactions rose by almost 15 percent year-on-year, and exceeded 1.4 billion transactions. This was mainly due to the significant increase in payment card purchase transactions, similarly to previous years. As a result of the growth of over 19 percent, the number of payment card purchase transactions came close to 1 billion (Chart 4). The further spread of the contactless technology and the steadily high level of security made a major contribution to the dynamic growth in turnover, similarly to previous years. Contactless transactions accounted for 92 percent of domestic physical purchases conducted with cards issued in Hungary (Chart 4). At the same time, online purchases gain increasing ground in card transactions, due to the spread of various web shops and the strengthening of consumer confidence: in 2019 online purchases conducted with domestic cards accounted for 15 percent of the total number of purchase transactions. Due to the change in consumer habits resulting from the coronavirus pandemic, this trend presumably may become even stronger in the future. In addition to domestic purchases, growth is apparent in the cross-border turnover as well. The roughly 90 million cross-border transactions, at an annual level, indicate a growth of 30 percent; however, only a smaller part of them (31 percent) were linked to purchases conducted at physical acceptance points. The majority of them (69 percent) were connected to card-not-present orders through the internet.

Chart 4

Turnover of main domestic payment transaction types related to payment accounts (2012-2019)



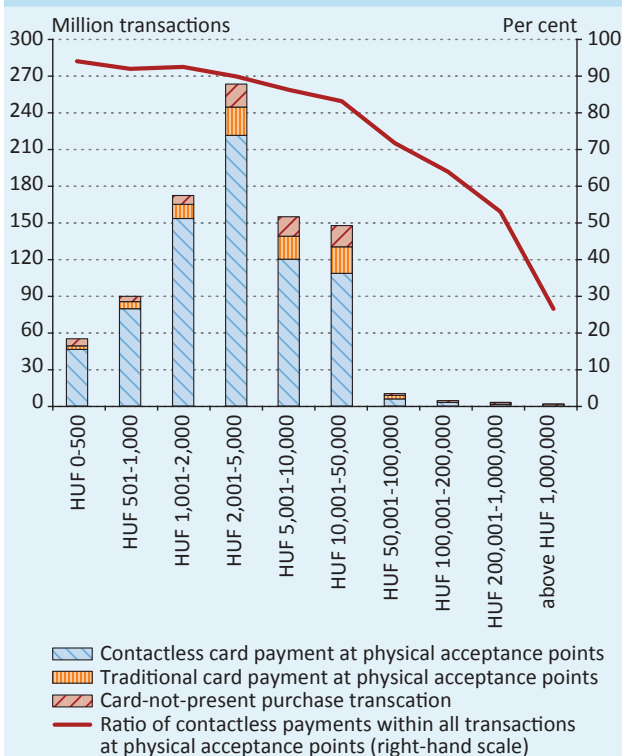
In 2019, substantial growth was also registered in respect of card-based innovative payments and credit transfers. As a result of the spread of innovative payment solutions, 3 percent of transactions in terms of number and 2 percent in terms of value conducted with payment cards issued in Hungary took place through mobile wallet applications offered by domestic payment service providers. Although these ratios still appear to be low, the 30 million transactions and the amount of HUF 156 billion exceeded the values registered in 2018 almost four times. In addition, the number of credit transfers expanded at an accelerating rate of almost 7 percent in 2019, which is expected to strengthen further as a result of the introduction of the instant payment system on 2 March 2020, also paving the way for the appearance and spread of credit transfer-based innovative payment solutions.

The large majority of purchases conducted with payment cards still take place in the segment below HUF 50,000, while in the value categories relevant in terms of turnover the use of contactless technology exceeds 80-90 percent. In a breakdown by value limits, 64.7 percent of card purchases include payments below HUF 5,000, while 98.5 percent of turnover is concentrated in the segment below HUF 50,000. Although in the categories over HUF 50,000 the usage of cards is drastically lower, which may be attributable to the lower occurrence rate of higher value transactions. The ratio of contactless purchases slightly decreases in proportion to the increase in the value of card-present physical purchases. Nevertheless, this ratio in the categories below HUF 5,000 exceeds 90 percent, and it exceeds 80 percent also in the segments between HUF 5,000 and HUF 50,000. Less frequent occurrence of contactless purchases in the case of higher value transactions may have been attributable to several factors in 2019: on the one hand, the

mandatory PIN entry over HUF 5,000, where the handling of the POS terminal by the customer could not be avoided, on the other hand, the potential concentration of POS terminals not supporting contactless technology at those physical merchants where the composition of the average consumer basket typically results in higher value payment transactions, and thirdly, the sense of greater certainty

Chart 5

Breakdown of payment card purchase turnover by value limits in the domestic acquiring network and ratio of contactless payments in the individual amount categories (2019)

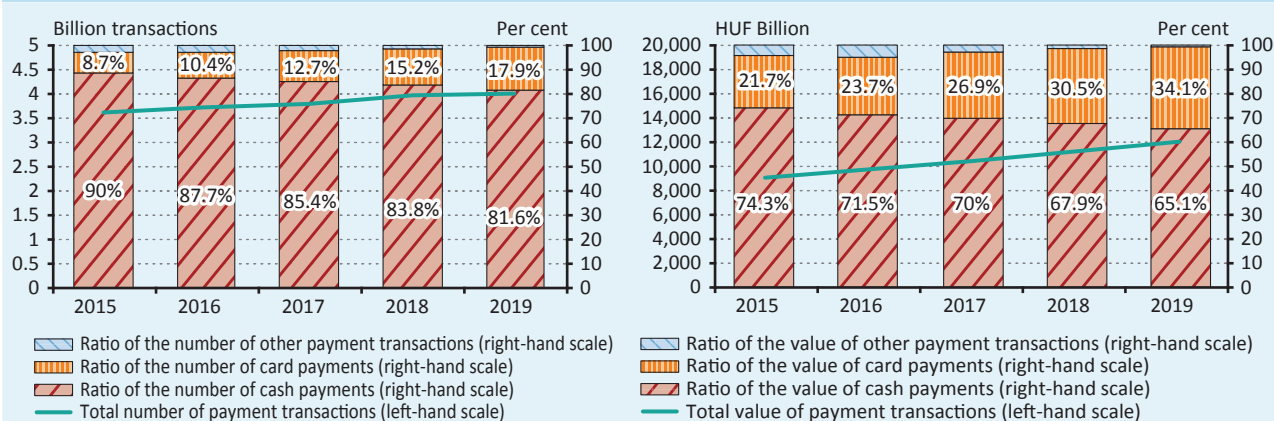


for the execution of payments conducted with traditional card transactions in the case of higher value payment transactions, which is less and less typical. (Chart 5)

Although based on 2019 data in the database of online cash registers cash is still the most frequently used method of payment, in the past years the ratio of electronic transactions soared in Hungary. The penetration of electronic payments is also evidenced by the change in the distribution of payment methods observed in the database of online cash registers. In 2019, 17.9 percent of the roughly 4 billion transactions were carried out by payment cards, representing a growth of 2.7 percentage points year-on-year. The usage of cash continues to show

a declining trend. Nevertheless, its ratio in terms of the number of transactions is still very high, 81.6 percent. When examining the value of payment transactions, the situation is more favourable, since card purchases accounted for more than one-third of the total transaction value, and thus cash payments accounted for only 65.1 percent. In addition, the ratio of other payments fell to a larger degree than before, particularly in terms of transaction value; one reason for this may be the restructuring of the fringe benefit system and, in parallel with this, the narrowing of the range of the various available benefit components, such as vouchers, since vouchers appear in the database of online cash registers as other method of payment. (Chart 6)

Chart 6
Ratio of the number and value of payment transactions included in the database of online cash registers by method of payment (2015-2019)



Box 1

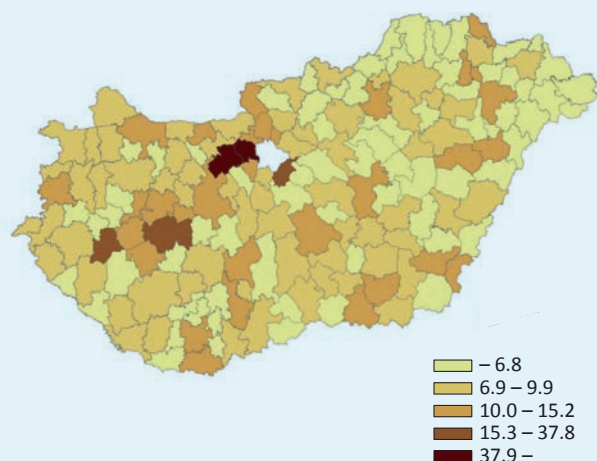
Regional data of card payment habits

In 2019, the MNB examined the regional features of card payments in Hungary, identifying the factors influencing the infrastructure and use of card payments². Based on this, the acceptance, ownership and use of cards is still low mostly in the eastern regions, farther away from the larger towns. The differences in the development level of the acceptance network are greatly attributable to cost factors. Accordingly, the introduction of cheaper instant payments is a favourable opportunity for a number of enterprises in terms of offering the acceptance of electronic payment methods.

When examining the acceptance network, several regional differences can be identified (Chart 7). In line with the expectations, at the level of counties, the coverage of Budapest is outstanding, with 26 terminals per one thousand persons, due to the fact that more than one-third of all terminals are installed here. In addition, Fejér and Pest counties show higher values in the number of terminals per thousand persons; the latter is primarily due to the Budakeszi district, which also includes Budaörs, with high level of concentration regarding retail units resulting from the easy access provided by motorways. The situation is the most unfavourable in this respect in Borsod-Abaúj-Zemplén, Nógrád and Szabolcs-Szatmár-Bereg counties, where the number of terminals per one thousand persons

² <https://en-hitelintezetiszemle.mnb.hu/letoltes/fer-19-1-st3-kajdi-nemecsko.pdf>

Chart 7
Number of POS terminals per 1,000 persons by districts (February 2018)



Source: Kajdi – Nemcskó: *Regional Features of Card Payments in Hungary*, (Financial and Economic Review, Volume 19, Issue 1, March 2020)

hardly exceeds 7. When examining card acceptance by districts, further regional differences can be identified (Chart 7). The card acceptance infrastructure is less developed in several districts of the Great Plain, while in the Budapest conurbation, at the Lake Balaton and in the vicinity of large towns it is more developed.

In connection with the maturity level of the card acceptance network, it was examined which variables have significant impact on the number of these devices in settlements where POS terminals are available. The results show that, in parallel with the decrease in settlement size, the number of terminals becomes significantly lower compared to large towns, even after eliminating the size impacts resulting from the number of inhabitants. The size of the card acceptance network is also positively affected in a specific settlement by the rising ratio of the retail and catering sector within the total number of registered companies. A similar positive relationship and significant impact arise in terms of the number of inhabitants and revenues from terminals.

Households' card ownership is closely related to age, the economic situation and the residence of the respective person. The ratio of card ownership significantly decreases in the older age groups, and there are also major differences in a breakdown by school qualification of the head of household. While less than half of those with primary school qualification own a payment card, this ratio among those with secondary school and higher education qualification is 72 and 85 percent, respectively. When examining coverage based on the economic activity of the head of household, the highest value (79 percent) is observed with employees, followed with a small lag by students and homemakers with roughly 75 percent, while this value is significantly lower (around 60 percent) with pensioners or the unemployed. As regards the regions, card ownership is lower in all regions compared to Central Hungary; in this respect the situation is the worst in the Northern Great Plain region. The financial standing of the household (income per capita, consumption) affects card holding positively.

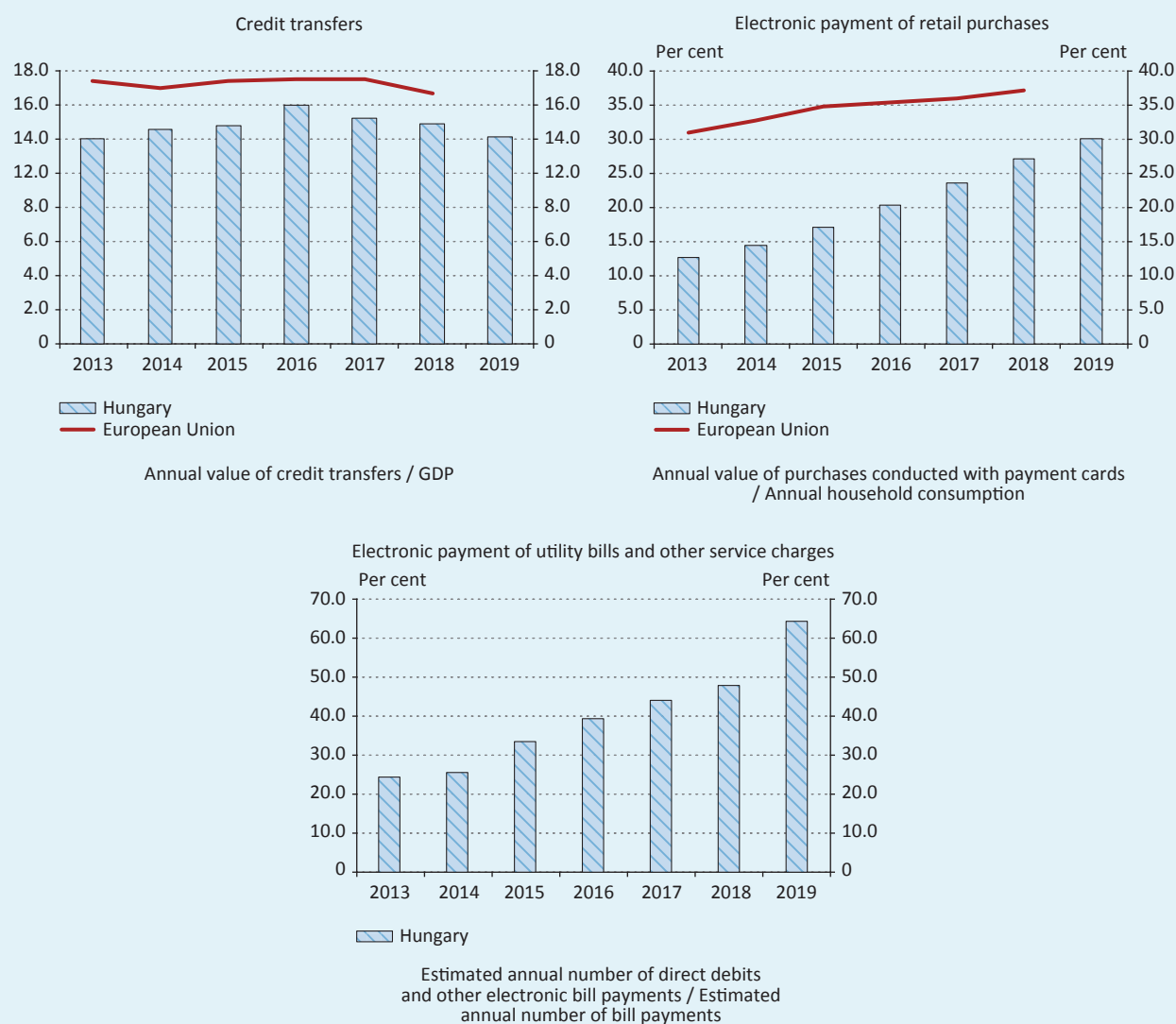
There is a large degree of concentration in card turnover in the large towns and the main tourist destinations. Nevertheless, card payment is used the most intensively in North-West Hungary, in addition to the capital. The regional distribution of card turnover should be examined, among other things, based on turnover per POS terminal, thereby taking into consideration the spatial differences in the acquiring infrastructure, namely, essentially how intensively cardholders use the developed card acquiring network. The regional distribution of turnover is much more concentrated than that of the acquiring network, and apart from the large towns, intensive card usage may be observed primarily in the north-west quarter of the country, which may be attributable, among other things, to the economic development of the Budapest conurbation, tourism in the Balaton Uplands and industrial centres close to the western border. In addition, card turnover is also influenced by a number of other factors, including the general economic development level of the region or the ratio of household cardholders.

2.1.3 Hungarian efficiency in a European comparison

The efficiency of domestic payments continued to improve in 2019, while the ratio of electronic payments continued to come closer to the EU average. The progressive and active role taken in previous years by the central bank and the government in fostering domestic infrastructures and the improvement of electronic payments made a major contribution to the further improvement in the development of domestic payments. Although the negative trend of the change in the ratio of credit transfer turnover to GDP, observed in previous years, continued, this is still primarily attributable to the higher growth rate of the

GDP. Nevertheless, the indicator is positively high due to the outstanding credit transfer turnover of the corporate sector, while the introduction of the instant payment system is expected to foster the reduction of the minor lag compared to the EU average. As a result of the development of the domestic payment card infrastructure and strong growth in card purchase turnover, considerable progress was observed also in 2019 primarily in the two indicators reflecting the efficiency of retail payments, namely the electronic payments of retail purchases and the electronic payment of utility bills and other service charges. As regards electronic payments of retail purchases, Hungary once again came substantially closer to the European level of development. (Chart 8)

Chart 8
Changes in indicators measuring the level of development of Hungarian payments (2013-2019)

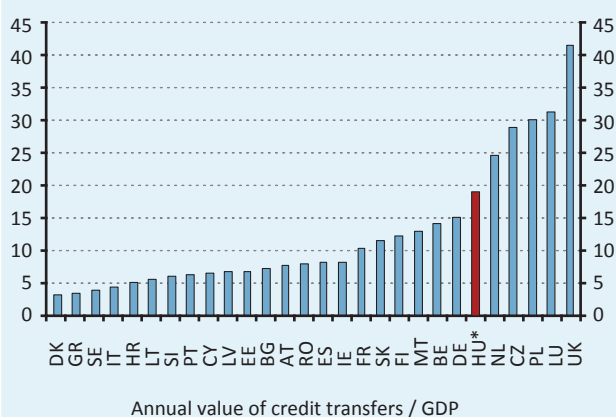


The Hungarian bill payment data before 2019 do not include the bill payments conducted not through postal money order or direct debit (e.g. card payment conducted online or at the service provider's local office and credit transfer), while the continuously increasing payments of postal money orders by payment card in the post offices have formed integral part of this indicator all the time. No European bill payment data are available for the purpose of EU comparison.

Source: MNB, ECB, Eurostat

In terms of the ratio of the annual value of credit transfers to GDP, Hungary is in the vanguard of the European Union. Similarly to previous years, there was a minor decline in the total value of credit transfers to GDP ratio, which is attributable to the GDP growth rate exceeding that of credit transfer turnover (Chart 8); however, Hungary is still ranked favourably in this branch among the Member States of the European Union (Chart 9). This is largely attributable to the fact that the large majority of the corporate sector's payment turnover – particularly the high-value transactions of major companies – are settled by credit transfers. The instant payment service, available since 2 March 2020, is expected to give new momentum to the improvement in the indicator through its effect exerted on the change in consumers' habits related to various payment situations, owing to the continuous availability of electronically initiated credit transfers and the extremely fast lead time compared to past practice.

Chart 9
Annual value of credit transfers to GDP ratio in the
countries of the European Union (2018)



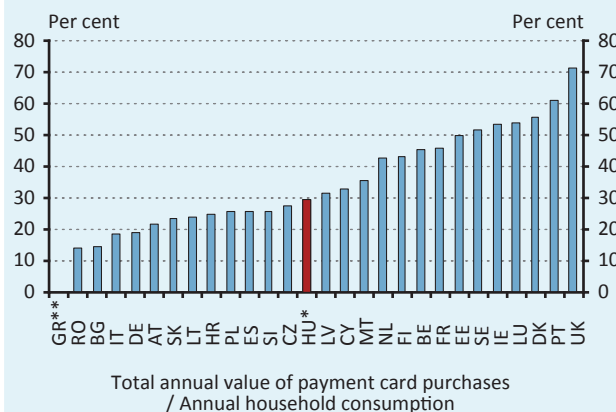
**Due to methodological differences and exchange rate changes, it is slightly different from the Hungarian value shown in Chart 8.*

Source: MNB compilation based on ECB and Eurostat data

In terms of electronic payments of retail purchases, Hungary is steadily in the mid-range of the European Union. Owing to the continuous spread of the contactless technology (Chart 1), the further strengthening of consumer confidence resulting from the card infrastructure's high level of security, the headway of innovative services (e.g. mobile wallets) built on the payment card infrastructure and steadily high growth in payment card purchase turnover resulting from the previously mentioned factors, Hungary is ranked favourably among the Member States of the European Union in terms of electronic payments of retail purchases (Chart 10). In 2019, strong growth, exceeding 3 percentage points, was once again registered compared to the previous year, which continues to exceed the average

growth rate of the EU (Chart 8). As a result of the above, Hungary is gradually approximating the level observed in the most developed countries.

Chart 10
Card payment of purchases in the countries of the European Union (2018)



Source: MNB compilation based on ECB and Eurostat data

**Due to methodological differences and exchange rate changes, it is slightly different from the Hungarian value shown in Chart 8.*

****At the time of analysis, data were not yet available.**

Electronic payments spread rapidly in the case of bill payments, which is attributable to the increasing range of payment methods accepted by the various bill issuers and to the changing consumer habits in parallel with the penetration of digitalisation. Along with the spread of digitalisation, consumers tend to give preference to electronic payment solutions also in the area of bill payments, which results in the suppression of cash transactions. The steady growth in direct debits and the fact that an increasing number of people use card-based payment of postal money orders introduced by the Hungarian Post also contribute to this. In addition, an increasing range of utility bill issuers provide the opportunity for settling the fee for services by convenient, remote electronic payment methods (e.g. online payment card purchases through mobile applications, internet customer service or external bill presentment agents). As a result of the above, in addition to the payment of bills by direct debit and postal money orders by payment cards, other forms of electronic payments, such as online payment card purchase or credit transfer, also spread rapidly. For that very reason, the MNB conducted a survey directly among the bill issuer service providers in order to assess the distribution of bill payment methods in 2019 as precisely as possible. As a result of which, in addition to the postal card payments and direct debits – until now playing a dominant role in electronic payments – credit transfers and online card payments to the service providers or to their agents, used increasingly commonly due to consumers’

changing bill payment habits, were also integrated in the applied indicator. As a result of this, compared to 2018 the value of the indicator rose by 16.4 percentage points to 64 percent (Chart 8). In the future, the request-to-pay service, forthcoming in connection with the introduction of the instant payment system, as well as the precautionary considerations of consumers resulting from the coronavirus may exert additional favourable impact on the indicator.

2.2 COST OF ELECTRONIC PAYMENT

2.2.1 Pricing trends

Based on the detailed analysis performed by the MNB in 2019, Hungarian banks provide credit transfer services expensively and in an unfavourable pricing structure even in an international comparison. In 2019, the MNB inspected³ the domestic pricing of payment services and found that Hungarian household customers' payment costs relative to their income is high even in a European comparison. The fact that only a few Hungarian banks apply package-based pricing, widely spread at international level – i.e. when credit transfer transactions are not burdened by direct fees –, is a further problem. Based on the analysis, the MNB formulated its expectations towards the banking sector, according to which, as part of the basic service, banks should allow all Hungarian retail customers, in the case of credit transfers as well, to initiate transactions in unlimited number and value without extra costs in exchange for the monthly account management fee.

The pricing structure of Hungarian payment service providers is too complicated, which hinders the comparability of account packages and market competition. The banking conditions applicable to domestic payment services are non-transparent and difficult to understand for consumers. At the same time, this also complicates the comparability of the individual account packages, which reduces consumers' willingness to switch accounts and thereby hinders competition in the payments market. In connection with fostering comparability, the provisions of the European Payment Accounts Directive provide partial solution, and in the medium run the spread of account information service providers, which can offer better account packages based on the customer's transaction habits, may also result in a change. The comparability of account packages – and thereby competition among service providers – would also be greatly supported by the introduction of package-based pricing, due to the much simpler fee structure than at present.

At the introduction of the instant payment system on 2 March 2020, the MNB once again reviewed the pricing of credit transfer transactions, and found that even now the number of customers that are able to initiate credit transfers without separate transaction fees is still relatively low. During the MNB's targeted inspection connected to instant payments, the credit transfer terms of 35 account packages of 10 banks were reviewed, considering the largest account packages, with over 35,000 customers. These account packages cover 70 percent of domestic accounts, held primarily for payment purposes, i.e. involve 4.4 million accounts. The purpose of the analysis was to ensure that at the introduction of the instant payment system on 2 March 2020 it is visible which banks offer account packages with package-based pricing, i.e. charge no separate fees for the credit transfer transactions, thereby supporting the spread of instant payments in Hungary. The analysis found that essentially only a small ratio of customers have an account package with package-based pricing. Only 3 percent of customers using the assessed account packages benefit from unlimited package-based pricing, while 13 percent of them benefit from limited package-based pricing, i.e. transaction fees are waived only below a certain limit or only the financial transaction tax is charged over HUF 20,000. Furthermore, there are several account products among these that the respective bank no longer distributes and as such not available to new customers. On the other hand, the situation is nuanced by the fact that among the retail banks with the highest number of customers there were a few that offered account packages with package-based pricing already during the time of the inspection and a few of them made such an account product available after the launch of instant payments. Furthermore, there are also additional account packages that comply with the package-based pricing requirements, but due to the small number of affected customers were not included in the scope of inspection.

The MNB formulated two main expectations: all banks must have account products with package-based pricing and the largest possible number of customers should use those. Based on the review of the banks' account conditions, the MNB formulated two firm expectations towards the sector. On the one hand, it is important to ensure that all banks have in their offering an account package that is available for a few hundred forints to anybody, facilitating the initiation of instant payments without separate transaction fees. On the other hand, in the case of account packages already satisfying the criteria, it is also of utmost importance that banks keep encouraging

³ <https://www.mnb.hu/letoltes/mnb-penzforgalmi-arazas-nemzetkozi-osszehasonlitasban-002.pdf>

their customers to use them. The MNB emphasised the importance of these objectives to the sector also in a management circular; however, if domestic banks fail to respond to the expectations of the MNB within a short time, the central bank will need to take additional measures to enforce pricing that better supports the development of domestic payment services. The wide-ranging spread of package-based pricing also bears utmost importance due to the fact that as after 1 January 2021 vendors obliged to use online cash register will have to provide their customers with the option of electronic payment, the use of the instant payment service – offering cheap and simple solution for small merchants – could be greatly fostered through accounts with package-based pricing offered to consumers.

All payment service providers must offer account packages available to a wide range of customers, where no separate fees are charged for credit transfers and which permit the use of modern electronic payment services. In addition to the fees for credit transfers other criteria may also be specified for account packages that are favourable in terms of payments. These may include, for example, the request-to-pay service, the offering of mobile payment application or making modern data input methods (QR code, NFC) available in mobile applications. It is also important to ensure that only such income and saving requirements are prescribed for the use of the relevant accounts that are sufficiently low for making it available to the large majority of consumers.

Box 2

European developments and domestic impacts in the pricing of payment services

Reducing the fee for euro credit transfer to the level of the fees for forint credit transfers

Owing to the requirements set forth in the EU Directive on cross-border payments⁴, from 15 December 2019 cross-border euro payments became cheaper in the Member States of the European Union (including also Iceland, Liechtenstein and Norway). Namely, according to the provisions of the Directive, the fee charged for cross-border euro payments must correspond to the fee charged for domestic forint payment of the same amount. In practice this means that for euro credit transfers and payments by payment card in the EEA member states, service providers may not charge more than the fee they would have charged had the payment transaction been carried out in Hungary in forint.

Increasing the transparency of currency conversion fees

Pursuant to the requirements in force since 19 April 2020, card issuer payment service providers are obliged to publish on their website or in the netbank the full fee charged for currency conversion related to card payments. Also from the same effective date, card acceptors that provide dynamic currency conversion (DCC)⁵ service at point of sale (e.g. cash register) or on the ATM, prior to initiating the payment transaction, are obliged to inform their customers in digital form on the terminal or on the ATM, or upon online shopping through the screen, of the full fee charged for the conversion in payment card purchase transactions or cash withdrawals. In view of the fact that the rate of the fees charged for conversion in the case of payment transactions initiated from forint payment accounts but denominated in a different currency may greatly vary by service providers, this allows customers to obtain information about these fees already before making the purchase.

⁴ Regulation 924/2009/EC of the European Parliament and of the Council of 16 September 2009 on cross-border payments in the Community and repealing Regulation 2560/2001/EC.

⁵ Dynamic currency conversion makes it possible to pay also in forint with onsite conversion (dynamic currency conversion) when making a purchase or cash withdrawal by payment cards at card reader terminals and ATMs. In this case the amount of the purchase or cash withdrawal is immediately converted also into forint at the exchange rate specified by the foreign service-provider operating the card reader terminal or the ATM, and the payment account is debited with this forint amount.

Introduction of a schedule of payment service fees to improve the comparability of account-keeping institutions

In addition to easing the switching of payment account and the payment account with basic features, the third pillar of the Payment Accounts Directive⁶ has been also transposed into the Hungarian legislative system. The purpose of the regulation is to ensure that consumers can obtain a clear picture of the fees paid for the use of their accounts, and to be able to choose from the account packages available in the EU more easily by relying on an account selection web application operated by the MNB. Pursuant to the payment service regulation, all payment service providers are obliged to specify all fees, costs and other payment obligations applied by them in a payment framework contract, and prior to concluding the contract inform their prospective customers — qualifying as consumers or micro enterprises — of these. However, in practice it is difficult to understand these contractual terms and conditions, as a result of which account holders tend not to pay attention to these costs and use an account package for many years or even decades that have a much cheaper alternative in the market, perhaps at another payment services provider. The Payment Accounts Directive tries to address this problem, by prescribing that all account-keeping institutions must prepare a schedule of fees for the account packages they offer. In order to facilitate the easier comparability of the account packages, the schedule of fees has a standard structure and form across the EU, and it also uses standard terminology in respect of the most common services, and shows the cost of individual services within the respective package (e.g. account-keeping or credit transfer). The schedules of fees have been also uploaded to the central website operated by the MNB, and thus interested customers can easily compare the offers of the account-keeping institutions. Furthermore, account-keeping institutions must also provide their customer with a statement of fees once a year, which contains all fees charged by them to the customer in the reporting year.

2.2.2 Service provider revenues

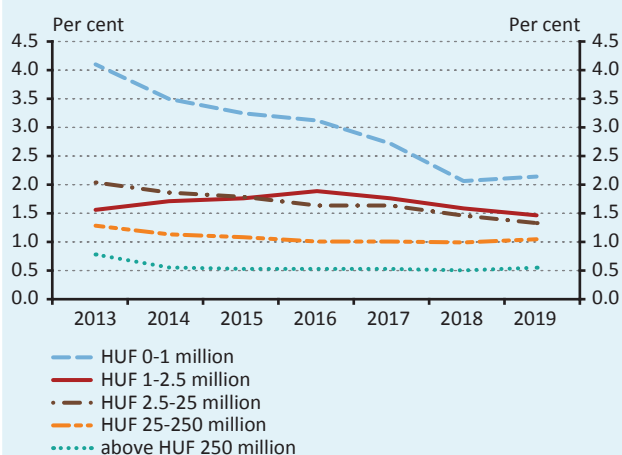
Growth in the domestic banking sector's fee incomes from payment services continued in 2019, and within the revenues the items related to credit transfers still had the highest share. Revenues from payment services rose by 10.3 percent compared to 2018 and came close to HUF 587 billion. The nominal growth — similarly to 2018 — was primarily attributable to the increase in turnover, namely a 13.8 percent rise in the total number of transactions and a 3.8 percent growth in the total value of transactions. Revenues connected to credit transfers and account-management were the highest in 2019 as well: 24.3 percent (HUF 143 billion) of service providers' revenues came from credit transfers, while items connected to account-management accounted for 19.2 percent (HUF 112 billion) of total revenues. Outstandingly high revenues connected to credit transfers are partly attributable to the fact that at this payment method the pricing applied by payment service providers, despite the MNB's expectations — as presented in detail in the previous subsection — is usually still unfavourable, since it burdens directly the transaction and is often proportionate to the value thereof. In addition, the volume of corporate payments is also significant in

terms of value at this method of payment, as a result of which the total value of credit transfers is by far the highest of all electronic payments. At the same time, the dominance of revenues linked to credit transfers also evidences that it is necessary to review and amend the pricing structure applied by domestic payment service providers in terms of retail credit transfers.

In terms of the costs of payment card acquiring, the burdens of smaller merchants are still high; moreover, the improving trend commenced earlier at the smallest merchants has come to a halt in 2019. As regards the quarterly turnover of merchants, apart from the categories of HUF 1-2.5 million and HUF 2.5 - 25 million, the ratio of payment service providers' revenues connected to card acquiring increased compared to payment card turnover, which represents increased costs for the merchants. It is a particularly negative development that the largest growth affected the category with quarterly card turnover below HUF 1 million, as a result of which in the case of the smallest merchants payment service providers' revenues once again roughly exceeded 2.1 percent of the turnover. Thus, the gap between the segments with the lowest and highest turnover once again widened. (Chart 11)

⁶ Government Decree 144/2018. (VIII. 13.) on Certain issues of the information given on the fees related to consumer payment accounts.

Chart 11
Ratio of bank revenues compared to payment card purchase turnover in merchant categories according to quarterly payment card turnover (2013-2019)



2.3 RELIABILITY OF ELECTRONIC PAYMENTS

2.3.1 Compliance with the payment legislation

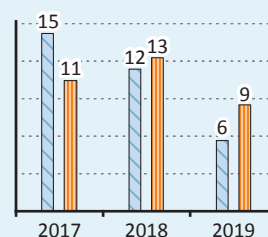
The focus of the payment inspections in 2019 was primarily on the inspection of the compliance with the new or amended rules laid down in PSD2. The inspection of the PSD2 rules commenced already in the inspection proceedings initiated in the second half of 2018, but most of these were completed in 2019. The payment inspections cover the entire spectrum of payment regulations, and are applied as the most efficient tool to enforce compliance. The criteria of individual inspections always focus on compliance with the new or modified requirements, and thus in 2019 it was PSD2 that received special attention. The onsite inspection carried out based on the annual plan was supplemented, as necessary, with continuous control performed through payment data reporting.

Within the framework of the regulatory payment inspections, the MNB pays special attention to the provision of access to customer accounts, and thus in 2020 it will inspect at sector level the proper functioning of the application programming interfaces (APIs) prescribed by PSD2. The MNB launches comprehensive inspection in view of the fact that from the documents sent within the framework of the sector-level data reporting related to APIs, it is not always possible to assess in full whether account servicing payment service providers' interfaces work with full functionality and in accordance with the statutory

requirements. In view of the above, it will be inspected at all payment service providers (account servicing payment service providers and third-party service providers) whether they comply with the requirements pertaining to secure communication, i.e. whether they have developed the API connection under PSD2 properly.

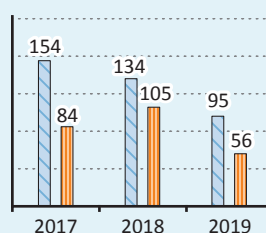
Chart 12
Key data of the payment inspections conducted by the MNB⁷ (2017-2019)

NEW/COMPLETED INSPECTIONS PROCEEDING



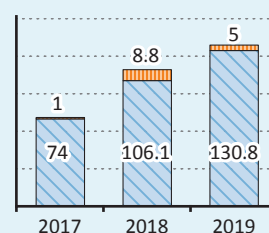
Number of new procedures / inspections
Number of completed inspections

NUMBER OF PROCEDERS / INSPECTIONS



Number of new inspection proceedings and onsite inspections
Number of measures required in closed procedures

AMOUNT OF FINES



Amount of fines (basic decision, million HUF)
Amount of fines (due to non-compliance with the decision, million HUF)

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 general experience of the payment inspections conducted in 2019 is that the operation of the payment service providers examined is adequate, although breaches were found in each case. In relation to the 6 new proceedings launched in 2019, the on-site inspection of institutions was carried out in the reporting year; at the same time – considering the inspection carried over from the previous year – inspection reports stipulating the findings of the inspections were sent to 7 institutions in total. These reports together identified 95 infringements.

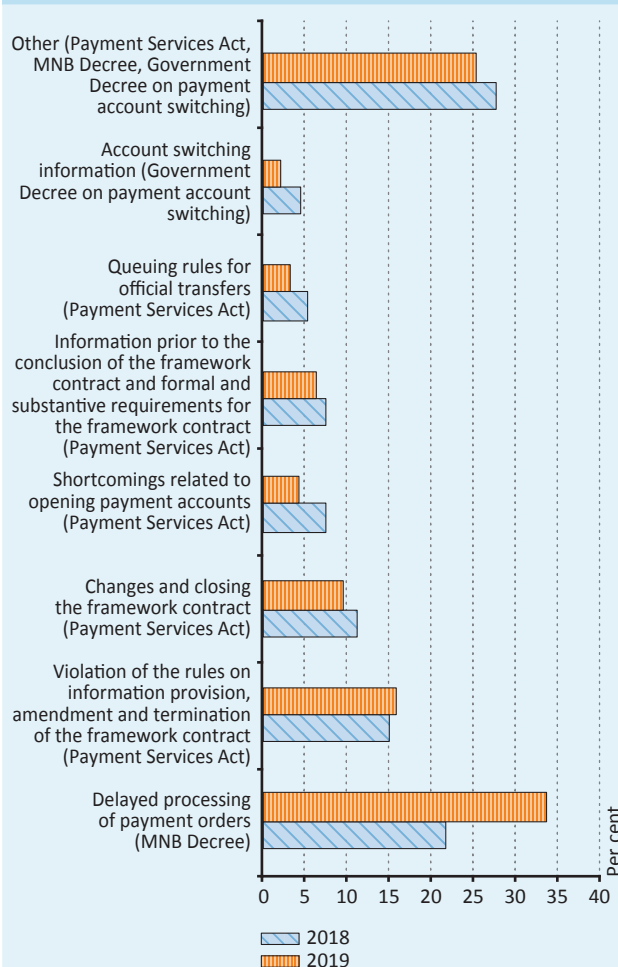
⁷ The chart presents the data of the results of the payment inspections taking into consideration the inspections carried over from previous year, where under the respective year the findings included in the audit report sent out in the reporting year and the procedures completed in reporting year are shown, irrespective of the year of launching the inspection.

In addition to the 56 measures prescribed in a resolution or warning letter in respect of the 9 inspections completed during the year, the fact of further 55 infringements was also recorded in respect of which it was not necessary to prescribe the submission of extraordinary report, since the institutions provably eliminated the findings included in the report by the time of issuing the resolution. At 6 institutions the resolution also included, in addition to prescribing measures, fines in the total amount of HUF 130.8 million, and in further one case, due to the failure to fulfil the measure prescribed in resolution in a former year by the deadline due in the reporting year, a fines of HUF 5 million was imposed together with repeatedly obliging the institution to terminate the infringement. (Chart 12)

In 2019, the most frequent breach of the payment laws committed by payment service providers was the failure to credit the amount of the payment transaction immediately. The infringements related to the MNB Decree on execution of Payment Transactions accounted for half

of all findings, and within that the breaching of the rules related to the immediate crediting of incoming payment transactions to the payment accounts is particularly striking, as it alone accounted for one-third of the identified infringements, and thus in terms of its ratio it significantly increased compared to the previous year (Chart 13). Although payment orders and payment transactions executed with a delay or incorrectly sometimes disrupted the predictability of customers' payment transactions, overall, they did not jeopardise it. In 2019, the failure to credit the transaction immediately affected particularly the payment transactions settled in VIBER; delayed crediting of the payment transaction settled in VIBER due to one-off or systemic reasons was established practically at all of the inspected institutions. The same also occurred frequently as an error in the case of foreign currency payment transactions, which was often attributable to the fact that the payment service provider did not quote the exchange rate continuously during its opening hours. Furthermore, half of the inspections identified delayed crediting in respect of postal cash transfers and intraday credit transfers, albeit the latter typically occurred not as a systemic problem but were rather attributable to ad hoc incidents impacting the IT system. The MNB continues to assess strictly the violation of the immediate crediting of the amount of transaction, as the development level of the information technology allows much faster processing in the payment service providers' systems since the publication of the relevant legislation.

Chart 13
Ratio of the main types of errors identified during the payment inspections (2018-2019)



In 2019, the second most frequent mistake was associated with the rectification of payment transactions, and with the liability and loss allocation rules. Almost half of the shortcomings identified during the year related to the breach of the Payment Services Act, where the number of infringements related to the rectification of payment transactions and to the liability and loss allocation rules was outstanding this year as well, accounting for roughly one sixth of all findings (Chart 13). This is partly due to the fact that certain payment service providers interpreted incorrectly the liability and loss allocation rules, tightened from 2018, and thus they failed to implement those properly in their procedures. As regards refunded payment transactions, primarily the rules related to the value date and to the due date of the refund were breached. The MNB has been observing for years the infringement that certain payment service providers stipulate in the framework agreement such conditions for the refund of payment transactions the amount of which is not known by the payer at the time of the authorisation or exceeds the reasonable limits, through which they are able to reject the refund claim also beyond the provisions of the Payment Services Act.

The most significant breach of the liability and loss allocation rules related to non-refunded, unauthorised payment transactions, which generated major financial losses in certain cases for consumers and micro enterprises. In many cases, payment service providers generally pass on the liability and the losses related to cash-substitute payment instrument (bank card, Internet banking, mobile banking) to customers, relieving themselves of the burden of proof stipulated in the Payment Services Act. In these cases they reject the complaints reported in connection with fraudulent payment transaction unauthorised by the customers based on such reasons, specified in the framework agreement, which do not comply with the statutory loss allocation rules. Because the use of a cash-substitute payment instrument in itself does not prove that the customer acted fraudulently or with gross negligence, the onus to provide credible evidence on this is on the payment service provider in all cases. Accordingly, during the inspections the MNB will not accept it in the future either when the payment service provider tries to prove the customer's fraudulent conduct or gross negligence merely citing the fact of the use of the PIN code or other passwords. If the proof is not sufficiently grounded, the payment service provider is obliged to refund the total amount of the unauthorised payment transaction, and reinstate the position of its customer as if the unauthorised payment transaction had not happened.

The third most frequent mistake in 2019 was the failure to observe the rules connected to the changes in conditions and termination of the framework agreement. A typical case of infringement related to the amendment is when the payment service provider does not allow at least two months for its customers to make their decision in respect of the unilateral changes in conditions of the framework contract. The purpose of the minimum period of two months, prescribed by the Payment Services Act, is to ensure that consumers and micro enterprises obtain information of the unilateral changes in conditions of the framework agreement (e.g. fee increase) in due course, so that they have sufficient time to formulate their position related to the change (acceptance of the amendment or termination of the contract free of charge). During the termination of framework contracts some customers also realised financial loss due to the fact that their payment service provider failed to settle their prorated financial receivables. The settlement obligation laid down in the Payment Services Act, according to which upon account closing the fees, costs and other payment obligations due to the service provider must be settled, applies not only to customers. The law prescribes for the service provider that it has to refund to the customer the prorated part of the fees collected in advance (e.g. annual bankcard fee paid

in advance) and the free account balance outstanding at the time of closing the payment account must be paid to the customer. In connection with the termination of the framework contract, it was also an infringement observed several times when the payment service provider specified a notice period shorter than two months for itself – outside the extraordinary termination applicable upon the customer's gross or repeated breach of contract. As a result, the payment service provider failed to provide consumers and micro enterprises, specially protected by the laws, with sufficient time to find a new provider in order to ensure the continuity of their payments.

The number of findings related to the switching of payment account not only decreased substantially compared to the previous year, but the losses incurred by the customers due to these errors also materially declined. While in previous years the MNB often observed the infringing hindering of the payment account closing connected to payment account switching, in 2019 this occurred only at one institution. Apart from this, additional findings included the non-comprehensive provision of information to customers and minor delays in the data transmission between payment service providers. The relevant decree aims to facilitate a rapid, efficient process of switching payment service providers for consumers, thereby fostering competition in payment services. It is clear that the payment account not closed at the previous account servicing payment service provider without a reason affects the consumer much more unfavourably than when the payment account switching process is prolonged by 1-2 days. The identified problem related to the provision of information affected a narrow range of consumers: those who would like to switch payment accounts not between two resident payment service providers, but when either the old or the new account servicing payment service provider is a non-resident service payment service provider operating in an EEA state.

In the second half of 2019, several new laws facilitating more efficient and faster payments and secure banking by customers as well as better customer information entered into force; the inspection of compliance with those commenced already in the fourth quarter of the year. The inspection of information on fees charged for payment accounts kept for consumers commenced during the last payment inspection at the end of the year. The rules that could be inspected in 2019 included primarily the rule of prior information, i.e. making the schedule of fees available, the purpose of which is to ease for the consumers the comparison of payment accounts offered by the various payment service providers. It will be possible to inspect the subsequent statement of the fees actually

charged in 2020 at the earliest, in view of the fact that the first statement of fees had to be sent to the consumers by the end of January 2020. Furthermore, it should be noted that from 14 September 2019 all payment service providers with accounts accessible online are obliged to develop a connection or interface suitable for safe communication, which facilitates that third party payment service providers can communicate over a safe channel with the account servicing payment service provider. The MNB started to assess the preparedness of the sector through extraordinary data reporting in November 2019; in addition, the detailed assessment of compliance with these rules formed part of the audit programme also during the last two onsite inspections of the year.

2.3.2 Prevention of fraud

The ratio of payment card fraud to turnover was negligible in 2019 as well, and a decrease was registered once again in the ratio of fraud events to the number of transactions. In the first three quarters of 2019 roughly 51,000 frauds were committed at the issuer side, which caused a total loss of almost HUF 1.6 billion. In nominal terms these figures represent a year-on-year growth; however, as a result of a larger increase in payment card turnover, the ratio of the number of frauds declined compared to the number of card transactions. And although the ratio of the loss caused by fraud events rose compared to the value of transactions, this is still negligible relative to the total turnover (Chart 14). The level of frauds at the acquiring side was even lower

than that, and a major decline was registered year-on-year: in the less than 5,000 incidents, losses were caused in the amount of HUF 268 million in the first three quarters of 2019, which falls short of the year-on-year figure by 22 and 2 percent, respectively.

It is still typical of payment card frauds that they primarily affect card-not-present, mainly online purchase transactions, and most of them are still linked to cross-border turnover. In parallel with the headway of cross-border online commerce and the more frequent appearance of malware and the various forms of online frauds, in recent years payment card frauds has shifted primarily towards online purchase transactions, the large majority of which are cross-border due to the dominance of foreign web shops. At the same time, the changes urged in connection with strong customer authentication – also ardently supported by the MNB – are expected to help curb these types of frauds in the manner presented in Section 4.2.1. Nevertheless, owing to the legislative background that puts the emphasis on consumers' interest, merely 7 percent of the total loss written off on the issuer side (HUF 1.2 billion)⁸ had to be borne by cardholders, while 43 percent of that was written off by acquirers and 50 percent by issuers. In the case of the total loss written off on the acquirer side (HUF 305 million)⁹, the largest degree of the loss affected domestic merchants, as they had to bear 61 percent of the total loss written off. (Chart 15)

Chart 14
Ratio of fraud and related losses to total payment card turnover on the issuer side (2010-2019 Q1-Q3)

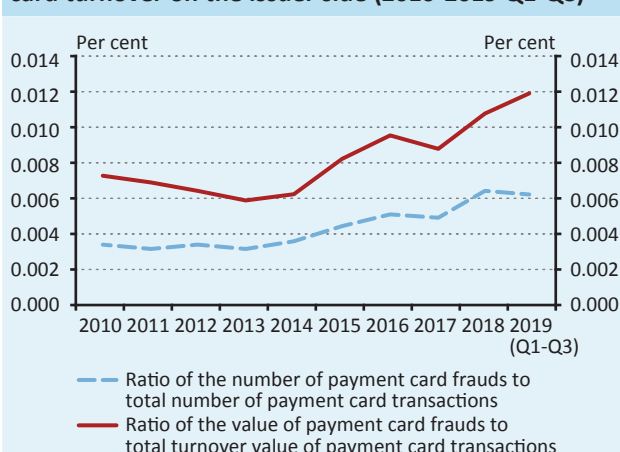
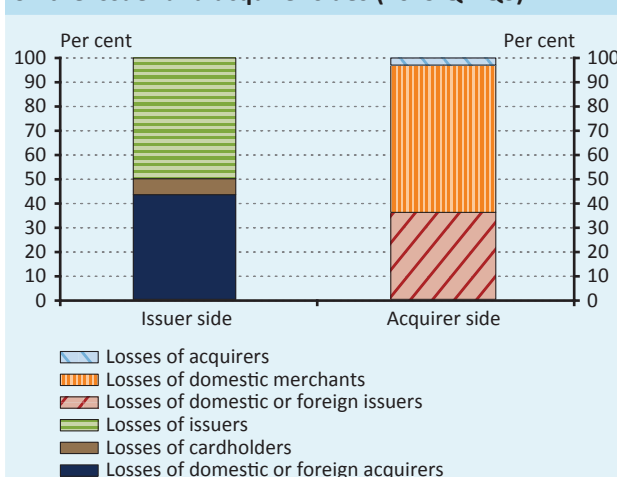


Chart 15
Losses written off in relation to payment card fraud on the issuer and acquirer sides (2019 Q1-Q3)

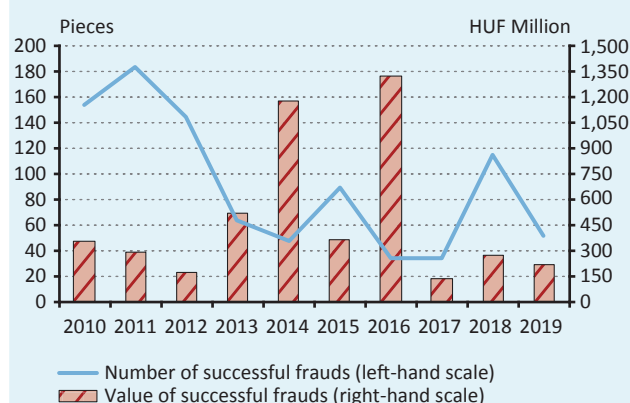


⁸ The amount of losses written off on the issuer side may differ from the amount of the total losses incurred due to the delay in terms of the settlement of certain transactions.

⁹ The amount of losses written off on the acquirer side may differ from the amount of the total losses incurred due to the delay in terms of the settlement of certain transactions.

In 2019, both the number and value of attempted and successful frauds in electronic payments, not related to payment cards, were negligible. There were merely 52 successful frauds during the year, causing a loss of HUF 218 million (Chart 16). In terms of number and value this represents a decrease of 54 and 22 percent, respectively, compared to 2018. 42 and 68 percent of the number and value of the attempted frauds, respectively, failed, which is equally attributable to the security mechanisms of payment service providers and to consumers' vigilance. Moreover, the loss of HUF 101 million written off during the period under review is negligible compared to credit transfer turnover of HUF 787,000 billion.

Chart 16
Number and value of successful frauds in electronic payments (2010-2019)

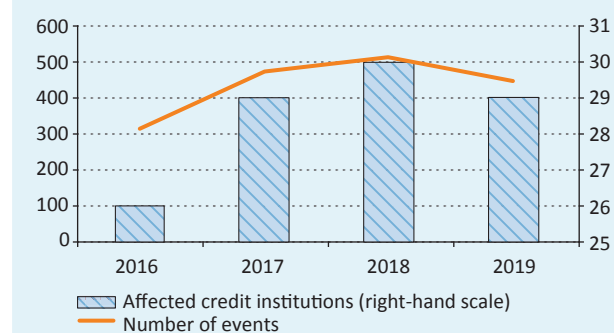


2.3.3 Payment incidents at payment service providers in 2019

The number of payment incidents has been decreasing in the banking sector for years. Considering the number of payment service providers and the complexity of the financial infrastructure, the number of cases is still low. The unfavourable trend of recent years turned around: after continuous growth, the number of malfunctions reported by credit institutions decreased in 2019 compared to 2018 (Chart 17). In 2019, the MNB received information on 442 incidents from 29 credit institutions in total. During the year, the average duration measured from the occurrence of incidents until their resumption was 12 hours, nearly 3 hours and 45 minutes shorter than in 2018. Based on the incident reports sent to the MNB, banks noticed the large majority of incidents before they were reported by their customers; on the other hand, the time between the occurrence and detection of the incident increased by almost half an hour compared to the previous year, amounting to 4 hours on average. The most significant domestic banks (9 credit institutions) in terms of payment services managed the

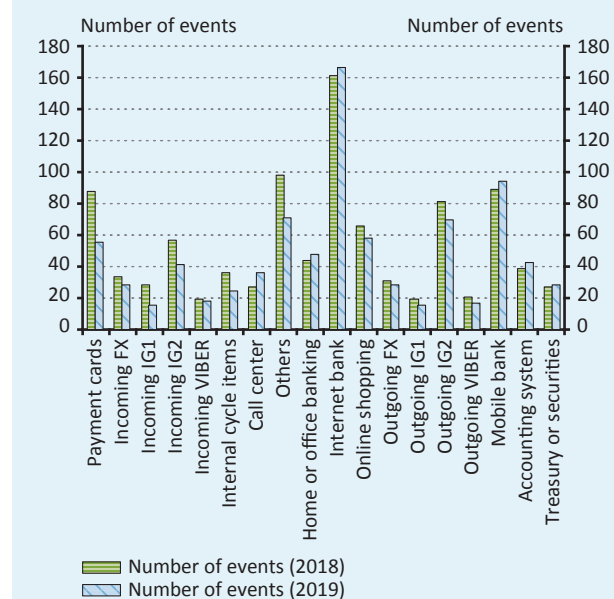
incidents better than other participants of the sector, in terms of the duration of the malfunction; however, the picture is distorted by the incident of a global bank network, which hindered the payment processes of the Hungarian branch office related to it.

Chart 17
Number of incidents at payment service providers and the number of credit institutions affected (2016-2019)



The fall in the number of reported incidents can be observed at several banking services. The number of incidents reported in connection with interbank forint and foreign currency credit transfers declined by almost one-fifth, which generally holds true for the ICS, VIBER and foreign currency credit transfers. A similar trend can be observed in the incidents related to the sending of authentication SMS. In addition, the ratio of incidents related to payment cards and ATMs also decreased compared to that observed in previous year: the number of incidents concerned bank cards or ATMs was 62 in 2016,

Chart 18
Distribution of the number of incidents at payment service providers by activity types (2018-2019)

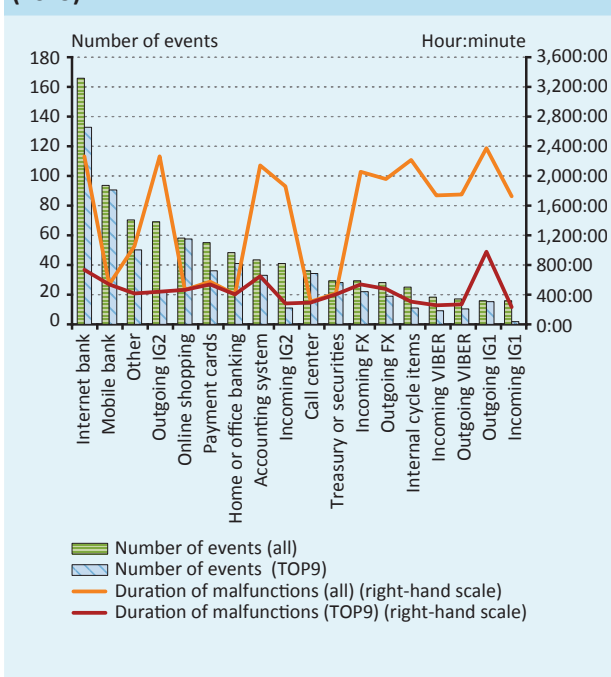


75 in 2017 and 87 in 2018. A significant portion of errors were still caused by various network failures, which is in line with the fact that the adequate functioning of business processes related to payment cards and ATMs requires the coordinated activity of various independent participants (e.g. card companies, retailers, credit institutions, telecommunication companies).

Similarly to previous years, the largest number of payment incidents was related to the internet banking systems in 2019 as well. Incidents affecting electronic banking channels, i.e. internet banking, home or office banking, mobile banking or call centre, account for almost 40 percent of all incidents, and their number continues to rise, albeit at a low rate. While in 2018 the number of incidents was 196, in 2019 it was 201, while their share in the total number of incidents rose by 1 percentage point to 39.72 percent. These incidents hindered customers the most from initiating credit transfers, enquiring on their account turnover as well as using other mobile banking services. Most of the reported errors were attributable to operations, maintenance not performed properly and to external service providers.

In 2019, the number of malfunctions exceeding 100 hours declined substantially and – contrary to the previous period – the faults were mainly related to external service providers. In 2018, the number of malfunctions exceeding 100 hours was 13, while in 2019 it was 7. In 2018, incidents lasting over 100 hours were typically attributable to malfunctioning applications, inadequately performed maintenance and unexpected input values during automatic

Chart 19
Number and duration of payment service providers' malfunctions by activity, highlighting the data of the nine most significant payment service providers (2019)



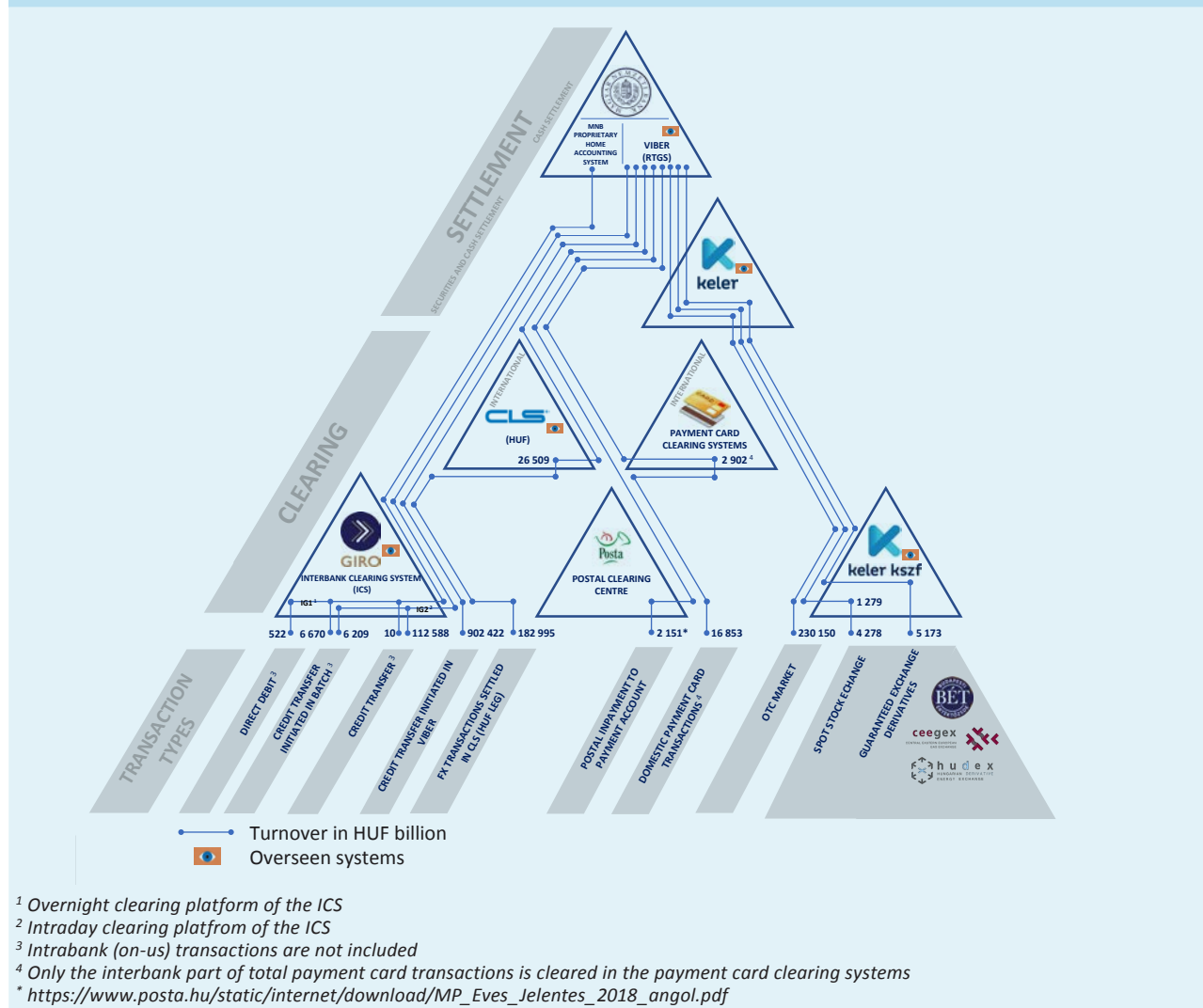
data processing, while in 2019 the occurrence of these incidents was insignificant. In two cases an external supplier transferred erroneous data, in one case it was a technical and in another one an operational problem, while in two cases it was a fault stemming from erroneous data upload attributable to application error that caused the prolonged malfunctions.

3 Domestic payment and securities infrastructures

Smooth execution of payments and 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, time-critical 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, the central securities depository (KELER CSD)

Chart 20
Overview of Hungarian financial market infrastructures (2019)



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 risk (Chart 20).

PAYMENT SYSTEMS

3.1 VIBER

Data sheet

Chart 21
Number and value of transactions settled in VIBER (2016-2019)

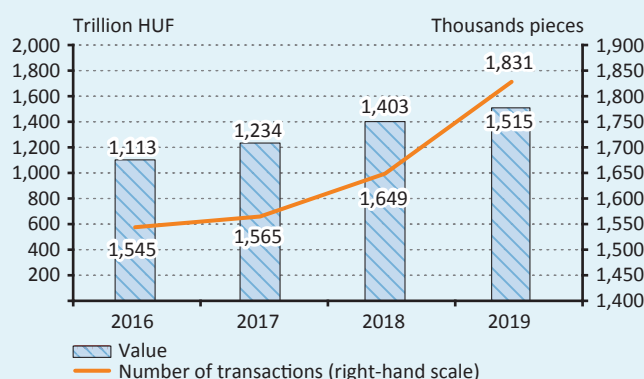
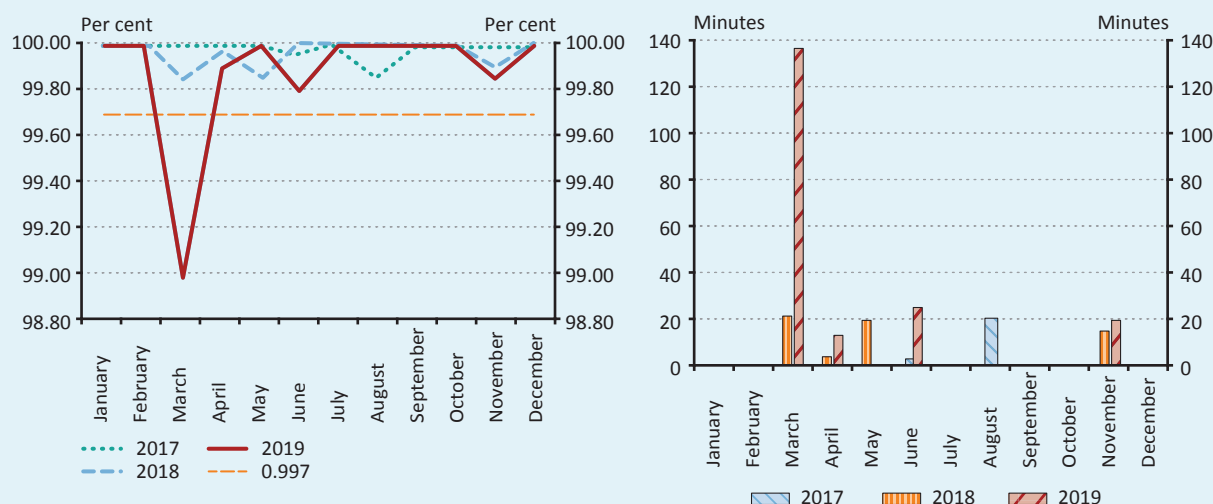


Chart 22
Monthly change in VIBER's total availability ratio (left-hand chart), and occurrence and length, in minutes, of full losses of service (right-hand chart) (2017-2019)



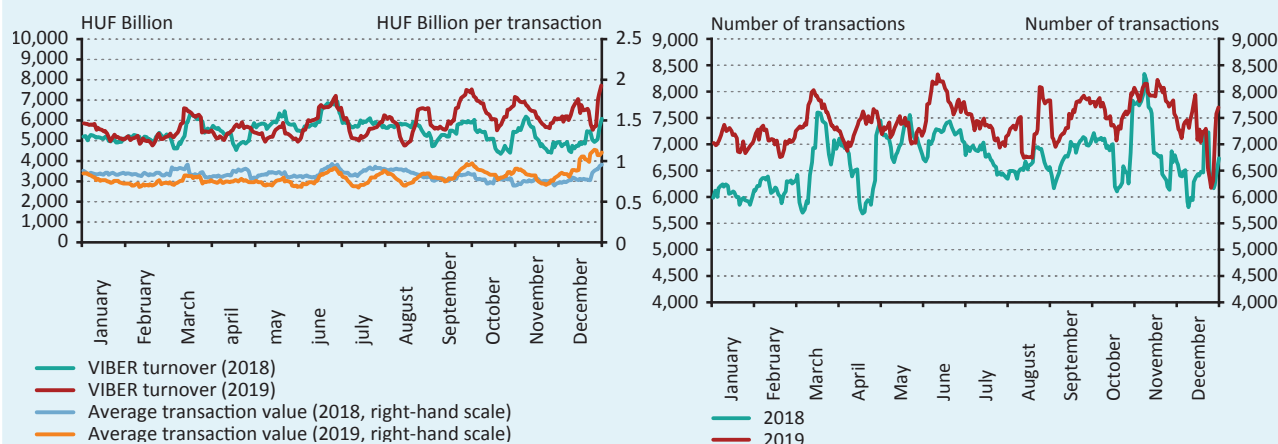
3.1.1 Current events

In 2019, VIBER turnover rose by 8 percent in terms of value and by 11 percent in terms of the number of transactions compared to 2018. VIBER turnover has been increasing continuously since 2016, and by 2019 it exceeded HUF 1,500,000 billion, and thus last year proved to be the year

with the highest turnover of the past decade. This growth is primarily attributable to the rise in the cash leg settlement of securities transactions by 13.5 percent and in the value of interbank transactions by 12 percent. Comparing it in seasonal terms to last year, growth in the value of turnover was the most significant in the period of September-December in 2019, while the number of transactions exceeded the figures

Chart 23

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 (2018-2019)



registered in 2018 throughout the year. As a result of the major increase in the number of transactions, the average value of a VIBER transaction fell by roughly HUF 23 million in one year, which primarily affected transactions exceeding HUF 10 billion. (Chart 23) However, in parallel with the major rise in turnover, average transaction value exceeded that of last year from September until the end of the year. Growth in the number of transactions included in turnover was mostly attributable to rises of 8 percent in interbank transactions and 9 percent in customer transactions.

The launch of the central infrastructure of instant clearing in production mode in ICS¹⁰ resulted in expanded services in the operation of VIBER. From 1 July 2019, the range of transactions processed in VIBER was expanded with instant internal transfers, which permit ICS participants to transfer the covers related to instant clearing in and out between their payment accounts held with the MNB and their instant settlement accounts in ICS. Instant internal transfers, and thus liquidity management connected to instant clearing, are available throughout VIBER operating hours. In addition, the business continuity processes related to the management of instant internal transfers upon a potential incident at GIRO or the MNB were also developed. The impact of instant payments on VIBER turnover can be assessed only after 2 March 2020, i.e. following the analysis of instant payment turnover becoming available for all customers of ICS participants.

In view of Brexit multi-step series of consultations have been conducted in order to maintain VIBER participation of CLS Bank International (CLS). Brexit also affects the CLS service: the CLS system has been designated on the basis of UK law, and thus in order to ensure settlement finality it was

necessary to review – and in certain cases to revise – the laws of the affected EU Member States. In order to ensure that the forint, as a currency, remains in CLS settlement also after Brexit, two tasks had to be completed. On the one hand, the MNB and the Ministry of Finance reviewed and interpreted Act 23/2003 on Settlement Finality (Settlement Finality Act) in terms of Brexit and as part of that interpretation it assured CLS of the fact that CLS, as a VIBER participant, is an institution that falls within the Settlement Finality Act. On the other hand, the MNB has explicitly stipulated in its business terms and conditions that CLS Bank International can be the participant of VIBER.

3.1.2 Risks

In 2019, VIBER operated in a highly reliable manner. Compared to the previous year, the service continuity risk increased only slightly, due to the longer incident times of complete service outages. The operation of VIBER was stable throughout the year; participants experienced full loss of service only on 7 days in 192 minutes in total. The availability of VIBER fell below 99.7 percent, stipulated as an overseer's expectation, only in March 2019: then VIBER services were not available to participants for more than 2 hours (Chart 22). The time between the start and elimination of incidents causing full loss of service exceeded fifteen minutes in three cases; the longest incident lasted 130 minutes. In 2019, the majority of incidents were caused by software faults and administrator issues. During the year, on one occasion customer and interbank operating hours were extended by 60 and 30 minutes, respectively, due to a VIBER incident, to ensure the completion of all clearing cycles in ICS intraday clearing.

¹⁰ Instant clearing means the infrastructural processes connected to the instant payment service.

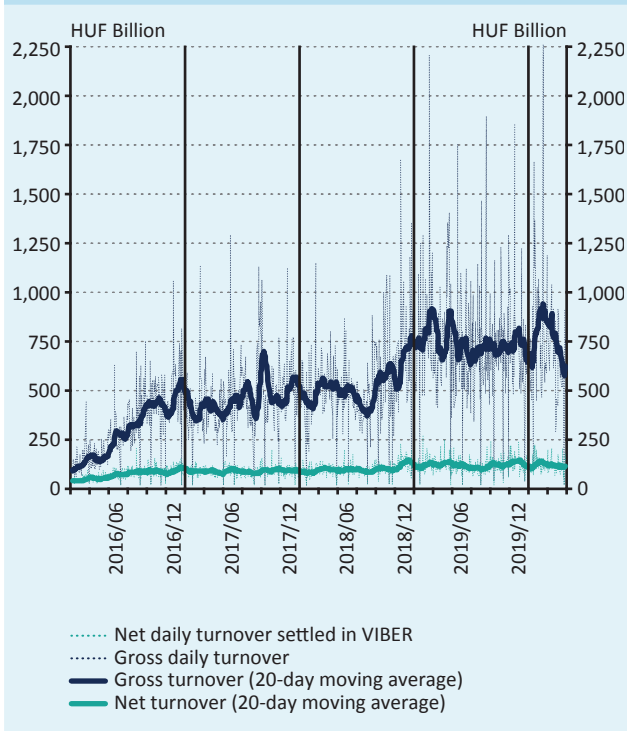
In 2019, clearing and settlement risk in VIBER was low, and liquidity was sufficient both at systemic level and at the level of individual banks¹¹. In 2019, VIBER participant incident was reported on 30 clearing days, which is one and a half time more frequent than in previous year. Due to the potential pass-through of the liquidity effect to other participants, which may increase clearing and settlement risk in the system, it is important to monitor the incidents related to VIBER participants. Namely, when there is an incident, the participant affected cannot send transaction to others and thus the funding effect of incoming transactions may decrease at those. 90 percent of participant errors were caused by SWIFT issues, while in the rest of the cases technical problems occurred in participants' internal systems. In 2019, at the request of participants customer and interbank operating hours was prolonged by half an hour and one hour, respectively, on one occasion. Compared to 2018 the frequency of the application of workaround solutions rose by 60 percent (18 cases) and the number of payment orders submitted to VIBER through GIROHáló or encrypted facsimile rather than through SWIFT trebled, which slightly increased service continuity risk due to manual processing in the MNB.

3.2 CLS

In 2019, the total value of the forint transactions settled in the international foreign exchange system of CLS grew by 48 percent, substantially outstripping the 11-percent growth in turnover, registered in 2018. In forint terms, in 2018 and in 2019 forint transactions occurred in the CLS system – developed for the settlement of interbank foreign exchange transactions – in the total amount of HUF 123,900 billion and almost HUF 183,000 billion, respectively, which when broken down into working days represents an average daily turnover of HUF 508 billion and HUF 741 billion, respectively, in the past two years (Chart 24). The growth is greatly attributable to the fact that in the second half of 2018 yet another large global bank decided to settle its interbank foreign exchange transaction with forint leg through the CLS system. The number of CLS Settlement Members settling the forint transactions through CLS was 26 at the end of 2019.

In parallel with the growth in turnover, the efficiency of the netting of forint transactions also improved; namely, in 2019, the members of the system had to pay in less forint on average to settle one unit of foreign exchange transaction. The elimination of the settlement risk of the interbank foreign exchange transactions is not the only advantage offered by the CLS service to the members of the system; the payment positions necessary for the settlement between

Chart 24
Daily gross forint turnover settled in the CLS system and the related daily net forint turnover settled in VIBER (February 2016 – February 2020)



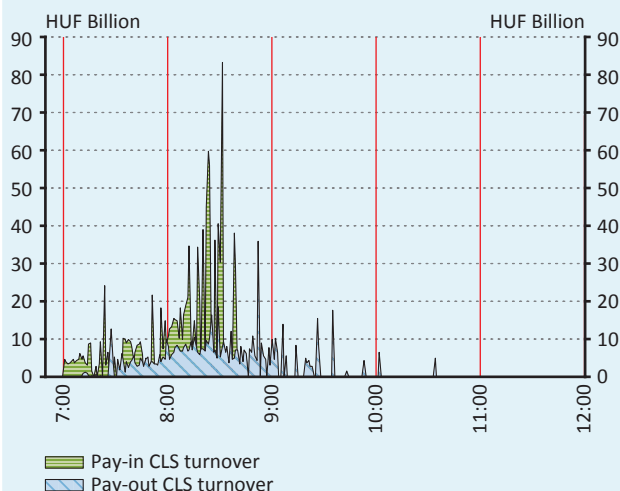
the members of the system are also netted on a multilateral basis, and thus the participants significantly reduce their liquidity needs in the 18 CLS currencies compared to gross settlement. While in 2018 the net forint requirement of the settlement of transactions was HUF 20,300 billion, which represents a liquidity-saving of 83.6 percent in proportion to the gross turnover, these values in 2019 were HUF 26,500 billion and 85.5 percent, respectively. Namely, in 2019 the efficiency of netting by CLS improved by almost 2 percentage points in respect of the forint transactions. This is important for two reasons: on the one hand, in lieu of the provided liquidity, Hungarian banks usually also charge a fee to the CLS members in proportion to the turnover, and thus the improvement in netting reduces the fee for the service, and on the other hand, the liquidity demand of the payments to CLS in the morning is a key item in the liquidity management of Hungarian banks, and thus the improvement in netting mitigates the liquidity pressure.

Payments to CLS still have not caused any liquidity problems in VIBER, and thus the related clearing and settlement risk remains low. In 2019, CLS Settlement Members provided forint funding for the CLS settlement of their foreign exchange transaction with forint leg through 5 VIBER participants¹² (nostrobanks), since they had no

¹¹ For the detailed analysis related to liquidity management see the section entitled 3.4 *Liquidity in the payment systems*.

¹² Nostrobank VIBER members in relation to CLS: CIB Bank, K&H Bank, OTP Bank, Raiffeisen Bank, UniCredit Bank.

Chart 25
Daily distribution of the average market value of the CLS Pay-Ins and Pay-Outs (2019)



direct membership relation with VIBER. As it follows from the operating rules of CLS, the Pay-Ins and Pay-Outs related to the settlement take place in the morning hours, i.e. the payments to the account of CLS with VIBER must be fulfilled in two time bands, specified by CLS, i.e. 7:00-8:00 and 8:00-9:00. In 2019 the daily average CLS Pay-In turnover of the period reached HUF 107 billion¹³, which accounts

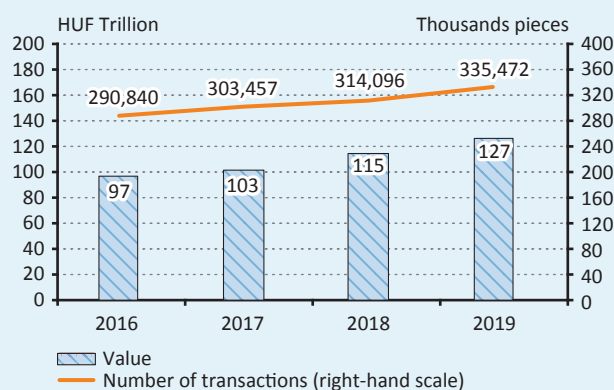
for 1-4 percent of the total VIBER turnover settled on the respective day. Despite the major turnover, in 2019 the nostrobanks fulfilled their CLS Pay-Ins mostly to the debit of their account balance, and they had to utilise the credit line only occasionally: the average credit line utilisation of the nostrobanks VIBER participants in the CLS Pay-In period was around 0.04 - 7.3 percent (Chart 25). The increase in the CLS turnover was realised under exemplary operational security: the five nostrobanks in Hungary providing forint liquidity for the settlement of the transactions applied a workaround solution compared to the normal operation in VIBER merely on six occasions during the morning processes of the 247 trading days of the year. The procedures of the banks and of the MNB performed well also in 2019.

In 2019 the MNB published the names and contact details of the five commercial banks rendering forint account-keeping services related to CLS in Hungary. In the spirit of transparency, the MNB – with the approval of the respective credit institutions – published on its website the names and contact details of the banks rendering CLS nostrobanking services in Hungary. On the same website, the central bank also publishes the aggregate monthly CLS transaction amounts, updated half-yearly.¹⁴ The nostrobanks in Hungary provided their foreign counterparties with reliable services in 2019 as well.

3.3 INTERBANK CLEARING SYSTEM (ICS)

Data sheet

Chart 26
Number and value of transactions settled in ICS (2016-2019)

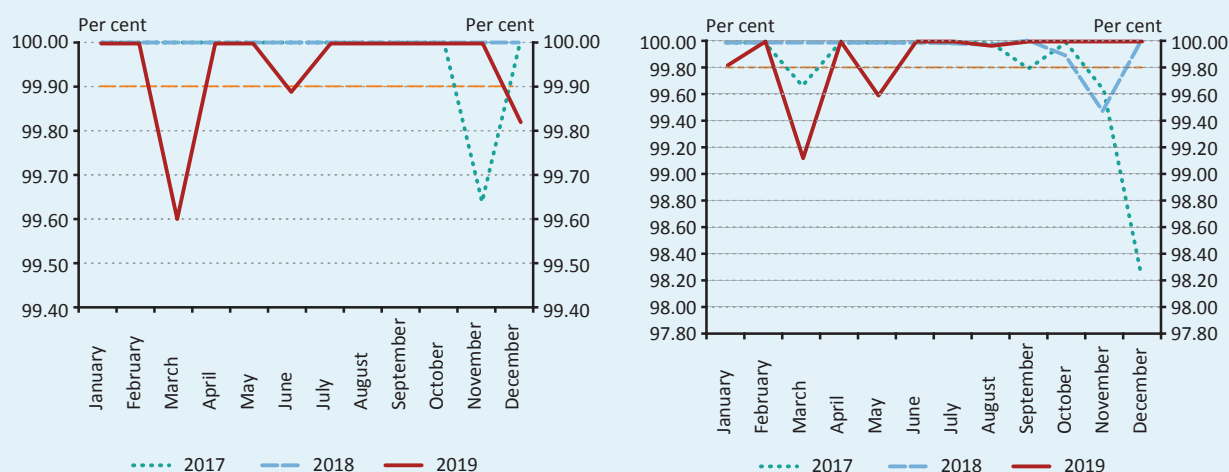


Source: GIRO Zrt.

¹³ If both the pay-ins to CLS and the pay-outs initiated by CLS are taken into consideration, the average daily turnover amount doubles, reaching roughly HUF 215 billion. This equals to 2-8 percent of the average VIBER turnover.

¹⁴ Hungarian language site: <https://www.mnb.hu/penzforgalom/a-hazai-penzforgalmi-infrastruktura/cls-kiegyenlites>
English language site: <https://www.mnb.hu/en/payments/settlement-systems/cls-settlement>

Chart 27
Impact of overnight (left-hand chart) and intraday (right-hand chart) clearing incidents on availability (2017-2019)



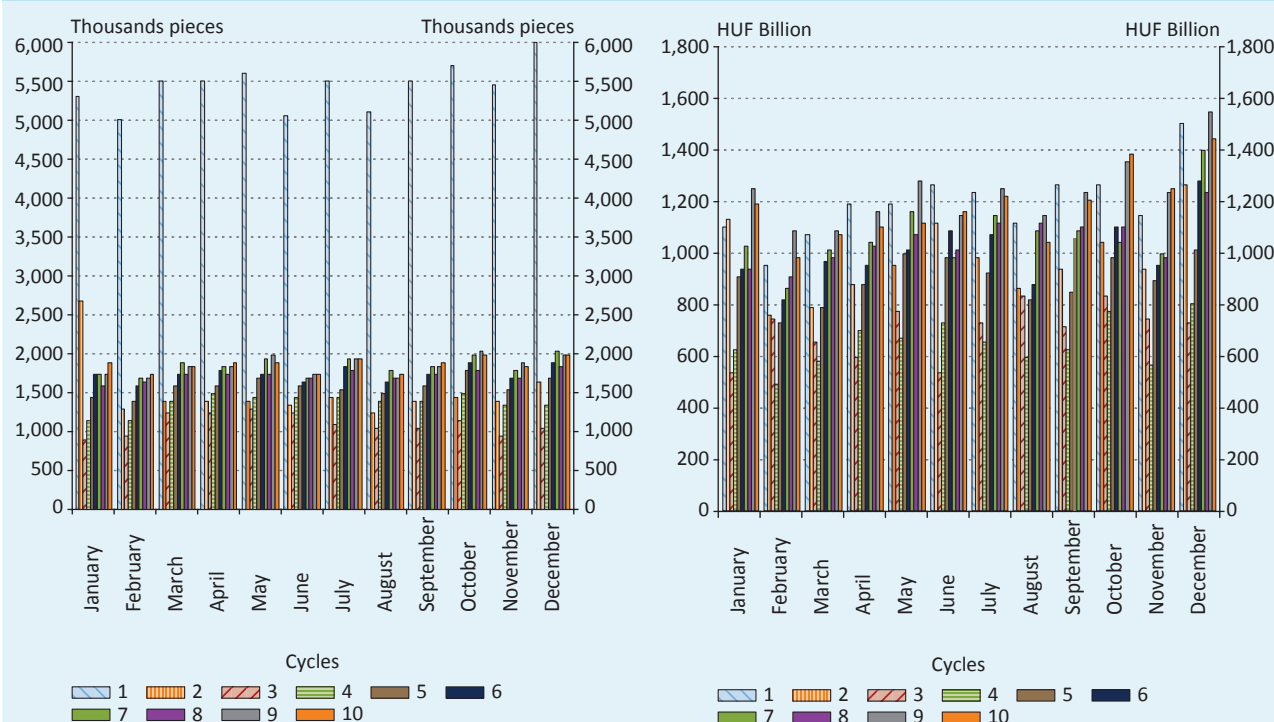
Source: GIRO Zrt.

3.3.1 Current events

While in ICS *overnight* clearing the number and value of turnover did not change materially in 2019, the number of transactions in ICS *intraday* clearing rose by 9 percent and their value by 11 percent compared to 2018. On the whole, 335.5 million transactions were cleared in ICS in the

total amount of HUF 127,000 billion. The rise in the number of transactions in intraday clearing was primarily caused by the 6.5 percent growth in individual credit transfers and the 31 percent growth in direct credits. The legislative change related to the use of SZÉP cards – according to which balances must be managed on payment accounts and top-ups must be performed as separate credit transfers by title

Chart 28
Distribution of the number of ICS intraday clearing transactions (left-hand chart) and value (right-hand chart) by cycles in a monthly breakdown (2019)



and person – resulted in a significant growth in individual credit transfers and direct credits. In addition, growth in direct credits was contributed to by the annual inflation-based supplementation of pensions in November 2019 and the payment of pension bonuses, as a result of which the number of direct credits rose by 3 million. In intraday clearing the first cycle is still the cycle with the highest number of transactions, since this is when (mostly retail) credit transfers initiated after the close-of-business of the previous day are cleared. During the year, turnover rose the most in January, April, September and in the holiday season of December: in each case a growth of 10-15 percent was recorded both in terms of the value and number of transactions. Most of the intraday transactions are still concentrated in the eighth and ninth cycles. (Chart 28).

In 2019, the most important development of GIRO was the creation of the central infrastructure of instant payments, which went live on 1 July 2019. Following the implementation of instant clearing, ICS now provides its services on three clearing platforms. Although customers of ICS participants were not yet able to send instant payments after the go-live, the trial run of instant clearing commenced with banks' low-value transactions. Instant clearing caused a major change in the operation of GIRO, since the daily, 24-hour real time operation calls for different competences and internal procedures compared to overnight and intraday clearing, in view of the fact that in respect of the latter GIRO has a major slack due to cyclicalities. Thus, shorter response time is necessary for the detection of potential problems, and faults must be eliminated rapidly in order to meet the undertaken service level. Participants and customers immediately notice the potential incidents due to the obligation related to the 5-second processing time of instant payments. In the trial period, which lasted until 2 March 2020, both the operating procedures and the software of the central infrastructure were fine-tuned, and thus, based on the experiences of the trial run, the software vendor delivered several versions.

Participants' liquidity management linked to instant clearing by ICS differs from that applied in the case of overnight or intraday clearing. ICS participants must provide liquidity for instant clearing not in VIBER but rather on ICS's instant payment accounts. Accordingly, this represents pre-financing, for the fulfilment of which the ICS participants must transfer liquidity from their payment account held with VIBER. GIRO performs the liquidity top-up and allocation connected to instant payment accounts

on behalf of participants: based on the liquidity parameters provided by participants it performs automatic fund checking every 15 minutes and then manages the resulting instant transfers in VIBER. At participants' request, the MNB elaborated the framework for the disbursement of credits outside VIBER operating hours, i.e. the instant loan scheme. The Credit Line Register module (HKNY) developed by GIRO, with the exception of the short period after the closing and before the opening of VIBER, is available almost continuously, and thus participants are able to bridge unexpected liquidity shocks even during the night or on bank holidays to the debit of their instant credit line provided in HKNY on a daily basis, which significantly reduces their liquidity risk.

3.3.2 Risks

Overnight and intraday ICS clearing operated in a reliable manner throughout the year, but service continuity risk rose slightly in both clearing systems compared to the previous year. In 2019, the availability ratio of ICS's *overnight* clearing fell below¹⁵ the undertaken service level in two months. (Chart 27). This is a significant decline compared to the previous year, since in 2018 no incident occurred in overnight clearing. The incidents were mainly caused by software faults. In 2019, the availability ratio of ICS' *intraday* clearing worsened compared to the previous year and remained below the undertaken service level on two occasions. (Chart 27). In addition, a delay occurred in the intraday clearing in respect of 1 cycle on 2 occasions due to VIBER incidents. Furthermore, incidents were also caused by a GIRO network error, and by the faulty connection between the intraday clearing and the central user database¹⁶.

3.4 LIQUIDITY IN PAYMENT SYSTEMS

Liquidity in VIBER and ICS systems 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 in VIBER, on the participants' payment accounts held with MNB. Due to this, ICS direct participants must also become VIBER participants, and thus the range of participants in the two systems is largely identical. As a result of this, participants use the same liquidity in VIBER and ICS for the settlement of payment turnover: the account balance on their payment account held with the MNB and the intraday credit line received provided against

¹⁵ Monthly availability ratio: ((number of working days*GIRO (night or intraday) opening hours – outage due to incident)/(number of working days*GIRO (night or intraday) opening hours))*100; ICS overnight clearing SLA 99.90 percent; ICS intraday clearing SLA 99.80 percent.

¹⁶ For the detailed analysis related to liquidity management see the section entitled 3.4 *Liquidity in the payment systems*.

their security portfolios pledged to the MNB. Participants of the payment system can manage their liquidity in VIBER; accordingly, in the next sections we present mainly the process that took place in VIBER. During the pilot operation of instant clearing in 2019, ICS participants settled only low-value transactions; therefore, we did not examine the effect of these transactions on liquidity.

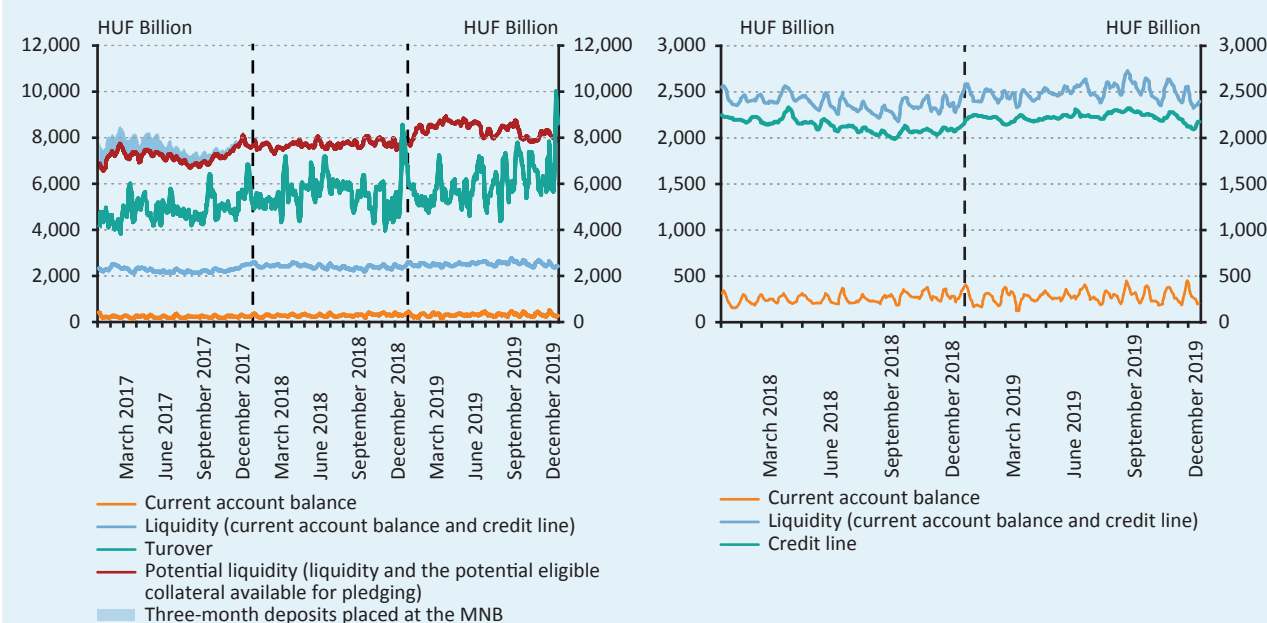
3.4.1 Factors that influence liquidity

In 2019, the modification of the central bank's monetary policy instruments did not influence materially the liquidity of payment system participants. VIBER participants continue to have extremely high liquidity, the level of which has not changed substantially in 2019 compared to previous years. The reserve requirement ratio did not change in 2019, and therefore the payment account balance remained the same compared to the previous year. At the beginning of 2019, participants' intraday credit line rose slightly, by HUF 200 billion, and finally stabilised at a level of 2,100-2,300 billion. The composition of securities pledged as collateral changed slightly; the share of government securities declined by

14 percentage points in parallel with the rise in the share of bonds and mortgage bonds. Meanwhile, households started to redeem their existing securities, since it was worth exchanging them for Hungarian Government Securities Plus (MÁP+); due to this a large volume of retail securities accumulated at banks, which then declined materially by the end of the year. As a result of the above, the liquidity of VIBER participants shifted slightly from HUF 2,300-2,500 billion (typical levels at the end of 2018) and stabilised at the level of HUF 2,500±200 billion during 2019. Two-thirds of payment system participants' potential liquidity¹⁷ comprises securities on the balance sheets of participants that may be optionally pledged therefore participants have a large liquidity buffer to conduct their payments. The level of securities holding that may be optionally pledged rose from HUF 4,200-4,800 billion, registered at the end of 2018, to roughly HUF 5,000-5,200 billion by mid-2019, and then after a moderate decline, it remained in the band of HUF 4,200-5,100 billion until the end of the year. On the whole, in 2019 the level of potential liquidity was around HUF 8,000-9,000 billion, exceeding the typical level registered in 2018 by HUF 500-1,000 billion (Charts 29-30).

Chart 29

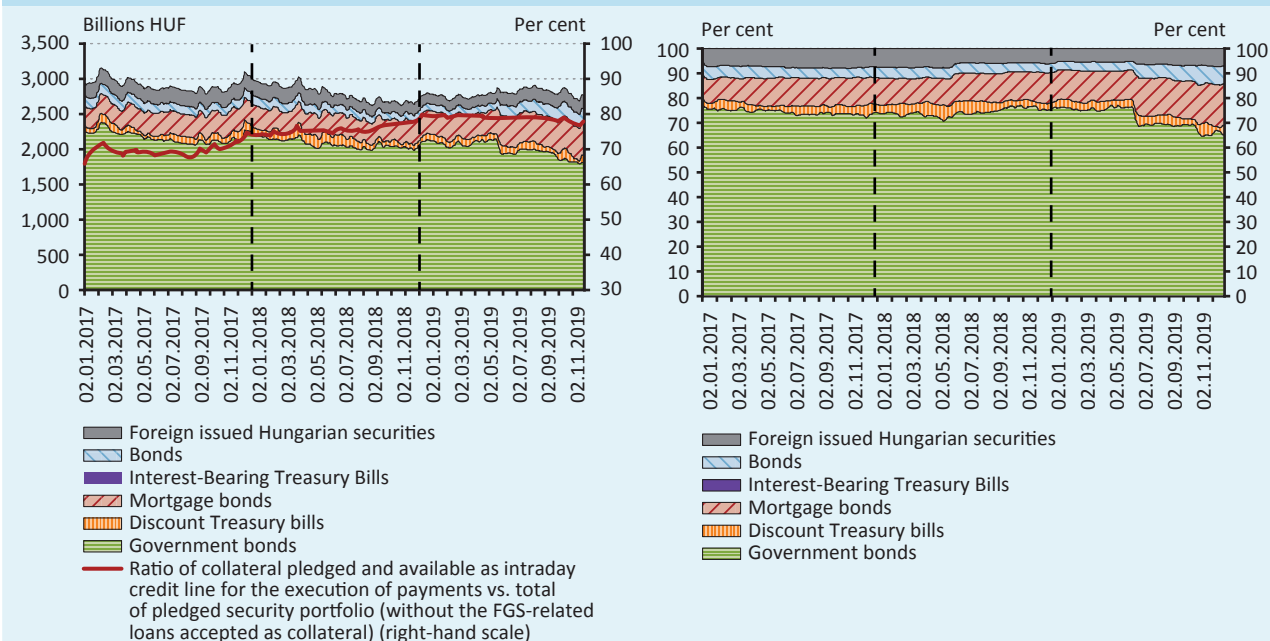
Changes in the account balance and liquidity, potential liquidity and turnover of VIBER participants (left-hand chart), highlighting the developments in the account balance and payment liquidity (right-hand chart) (2017-2019)



¹⁷ From the perspective of payment systems, potential liquidity is the sum of the account balance of the VIBER participants' payment account held with the MNB, the intraday credit line provided against the securities pledged by the participants to the central bank, and other, additionally available securities on the credit institution's balance sheet that may optionally be pledged.

Chart 30

Amount of pledged securities and the ratio of credit line to total pledged collateral (left-hand chart); distribution of pledged securities by type (right-hand chart) (2017-2019)



3.4.2 Liquidity management of VIBER and ICS participants

Payment system participants continued to manage their liquidity in an active and efficient manner in 2019 to settle their increased turnover. Proper intraday allocation of liquidity necessary for executing payments continues to be important for mitigating clearing and settlement risk. Due to real time operation, participants manage their liquidity

in VIBER all day, within that the hourly settlement of ICS intraday clearing cycles are regarded as priority periods. With the exception of the time band of 16:00-18:00 hrs, VIBER turnover rose in all time bands during the day. Higher-value transactions of VIBER participants, similarly to the previous years, are still settled in the late afternoon and evening hours; a large part of daily VIBER turnover (9 percent) is still settled in the last hour preceding the closing of VIBER. Since the amendment of the central bank's

Chart 31

Intraday developments 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 (2019)

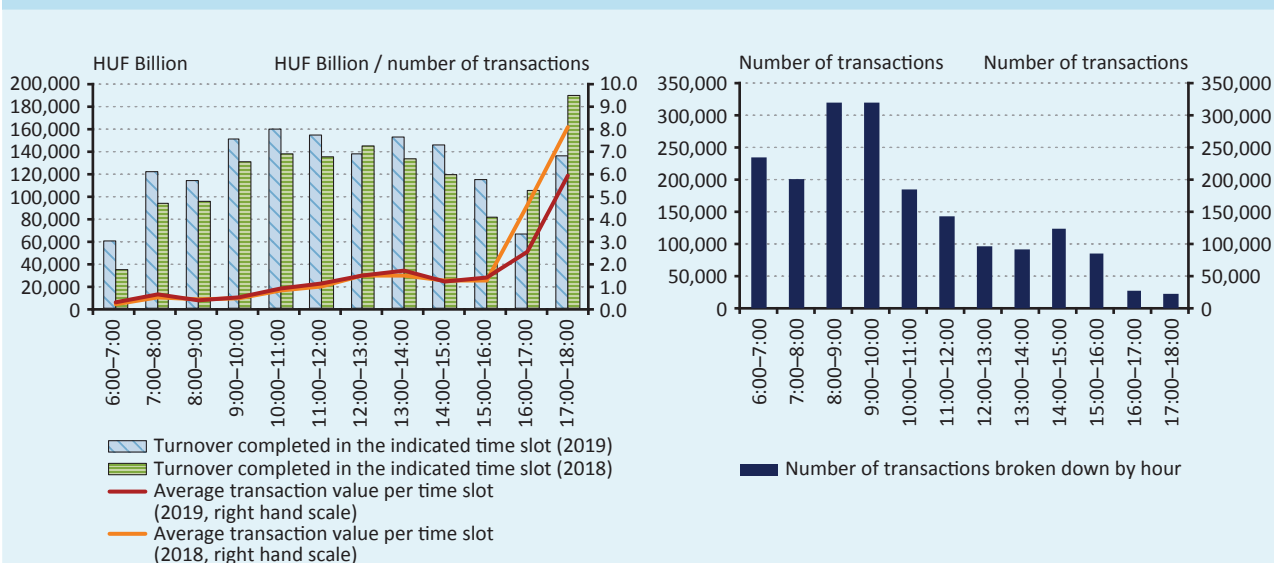
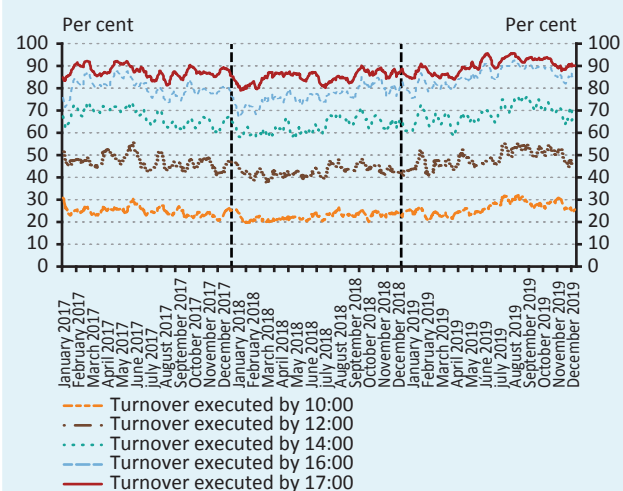


Chart 32
Timing of VIBER transactions (the portion of total daily transactions completed until a specific point in time) (2017-2019)



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

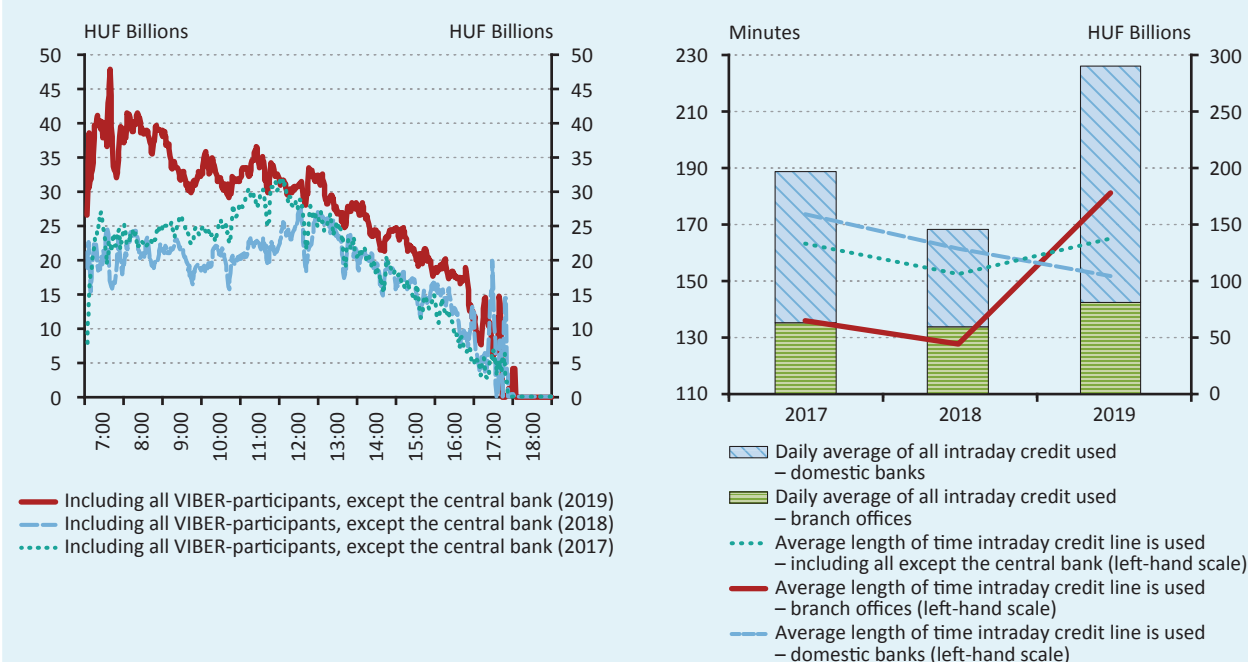
instruments did not necessitate the adjustment of liquidity management in 2019, it is presumably due to increased turnover that in the time profile of payments earlier timing of submission by 5-10 percentage points can be perceived in each of the reviewed daily time bands across the system. Participants could rely to a greater degree on the funding role of transactions received from their partners and also

had ample liquidity, and thus they were presumably not forced to postpone the initiation of their transactions, a phenomenon that is rather typical in a distrustful market environment. (Chart 31-32)

Turnover in the ICS intraday clearing cycles is balanced, and there is ample liquidity available in VIBER to settle the increased turnover. In 2019, the number of transactions in ICS intraday clearing rose every month by 3-15 percent compared to previous years, accompanied by an increase of similar degree, i.e. 5-15 percent, in value. For the settlement of intraday clearing in VIBER on average only 0.67 percent of the liquidity available at any given moment was necessary. The ratio of ICS turnover to total liquidity was higher only on tax payment days, and during the summer and year-end periods, traditionally characterised by higher turnover, but even then, it reached only 2 percent of total liquidity. Liquidity in ICS was ample both at systemic level and at the level of individual participants, and thus shortage of funding occurred only due to liquidity management errors, but even so only on a few occasions.

As a result of increased turnover in the payment systems, utilisation of the intraday credit line rose in 2019. The average value of intraday credit line utilisation almost doubled in 2019 at systemic level (it rose by roughly HUF 140 billion) compared to the previous year. This growth primarily comes from domestic banks, which used roughly

Chart 33
Value of the intraday credit line utilisation during the day in VIBER (left-hand chart) and its average daily duration, and the average value of the maximum utilisation of the credit line during the day, broken down by domestic bank and branch office (right-hand chart) (2017-2019)



HUF 120 billion more of their intraday credit line on a daily basis. In regards to branch offices, the value of utilised credit line rose by HUF 22 billion year-on-year. In addition, average utilisation of the intraday credit line by VIBER participants lengthened by 12 minutes, and thus on the whole it reached 3 hours per day. The underlying reason behind this phenomenon is mainly the change in branch offices' liquidity management, which on average used their intraday credit line for 54 minutes longer on a daily basis compared to the previous year. By contrast, domestic banks used their credit line for 10 minutes shorter on average, albeit in higher value. Credit line utilisation rose in almost all periods; the largest utilisation of the credit line took place from the start of day until 10 a.m. The change was caused mainly by domestic banks, while intraday credit line utilisation by branch offices was more balanced (Chart 33).

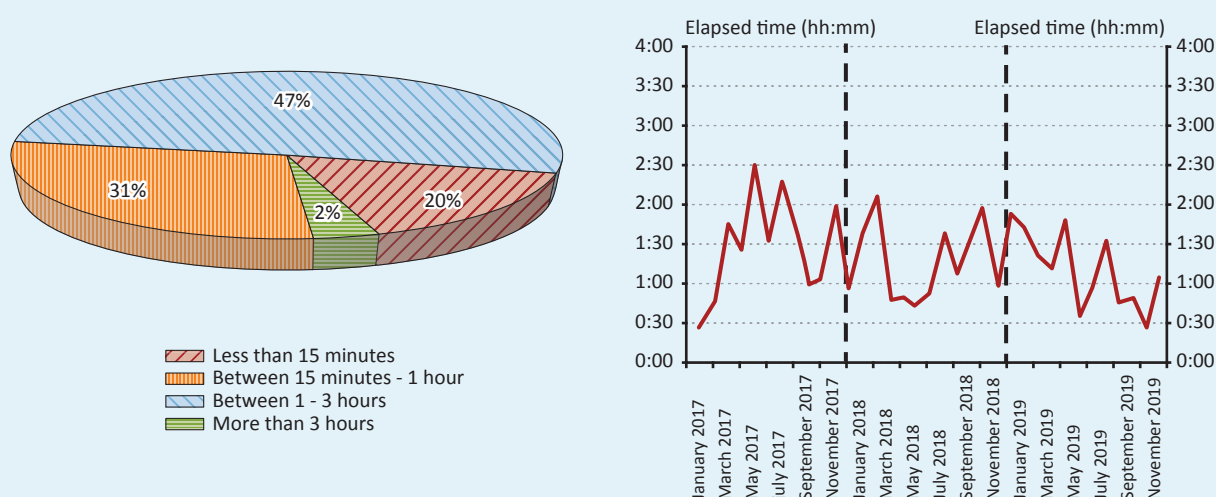
In 2019, the number of queued transactions in VIBER fell by 40 percent compared to 2018, while the average duration of queues practically did not change. VIBER transactions are placed in a queue until sufficient funds become available for execution (as a result of the financing effect of received, credited transactions or a credit line increase or queue rearrangement). The fact of queuing in itself does not necessarily mean that a participant has a liquidity problem, as the existence of queues is a natural part of the operation of real-time gross settlement systems. Due to this, queuing is not always caused by a liquidity issue, it may also be attributable to the liquidity management of individual banks. Compared to previous years, still only a negligible part of VIBER transactions (0.1 percent, almost 2,500 items) were queued, which is a considerable decrease compared to 2018. A queued transaction occurred on 83 percent of working days, but the time spent in queue

(1 hour on average) practically remained unchanged compared to prior year. Continuing the trends observed in the previous year, queuing typically started in the first two or three hours after the opening of VIBER within the day, and transactions were out of the queue by 13:00, at the latest. (Chart 34) Due to the different liquidity management practices conducted by participants, the duration of queues varied widely. Banks with a high monthly queuing frequency are typically participants with active liquidity management and high credit line utilisation, whose transactions tend to be queued up for an average of 70 minutes per day, similar to previous years. Considerably longer queues, exceeding three hours, also occurred, but the number of these cases was negligible (comprising 2 percent of all queued items), and involved participants with less active liquidity management. Since VIBER turnover of these participants is low, they did not cause liquidity issues for others.

In 2019, funding shortfall in the ICS intraday clearing occurred 10 percent less frequently compared to the previous year; however, the number of transactions involved in rollover rose by two and a half times. If an ICS participant fails to provide sufficient funding in VIBER for the settlement of its transactions submitted for the respective ICS cycle, the transactions left without funding are transferred to the next settlement cycle. In 2019, due to the liquidity shortage of 5 ICS participants, rollover between cycles took place on a total of 29 occasions, in the amount of HUF 97.9 billion. The rollovers were attributable to liquidity management issues or erroneous practice, since all the participants involved had sufficient optionally pledgeable securities holdings. Pledging this for the intraday credit line the necessary amount of liquidity could have been provided. 76 percent of rollovers spanned one cycle,

Chart 34

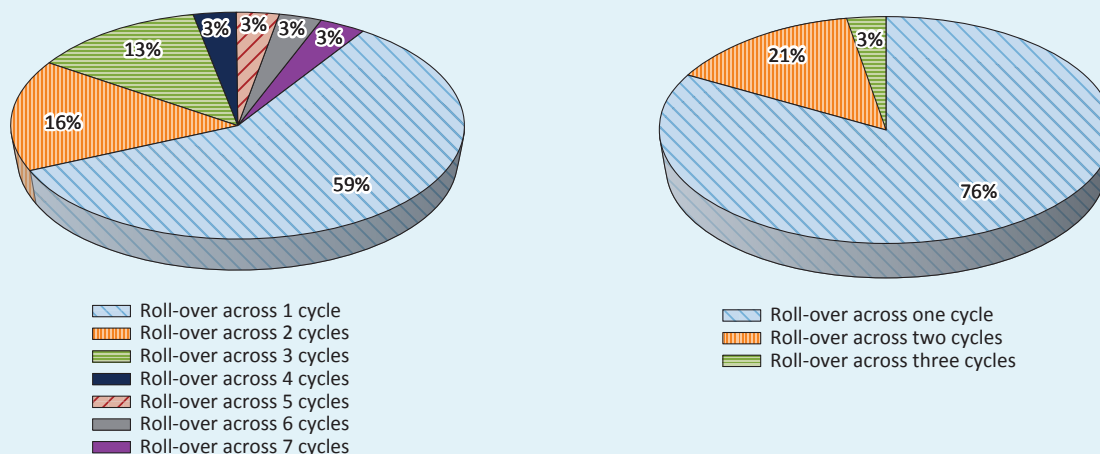
Average daily duration of queuing (right-hand chart – (2017-2019)) and its distribution (left-hand chart – 2019)



21 percent affected two, 3 percent affected three cycles in 2019 (Chart 35). Due to the hourly cycle settlement of ICS, with rollovers spanning three or more cycles, participants already breach the 4-hour rule of the Payment Services

Decree¹⁸. In 2019, 52 percent of the rollovers belonged to an ICS participant having low turnovers and the same participant was responsible for all rollovers spanning two and three cycles.

Chart 35
Ratio of roll-overs to total roll-overs 2018 (left-hand chart) - 2019 (right-hand chart)

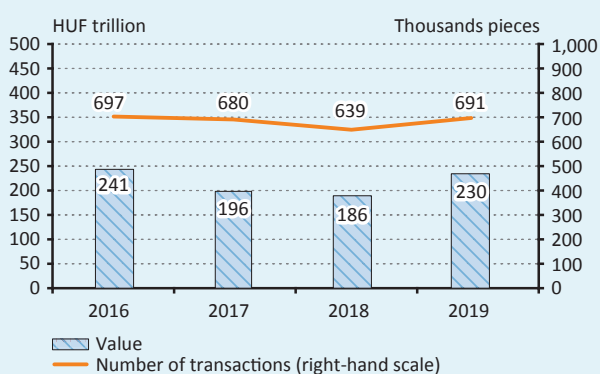


SECURITIES INFRASTRUCTURES

3.5 KELER

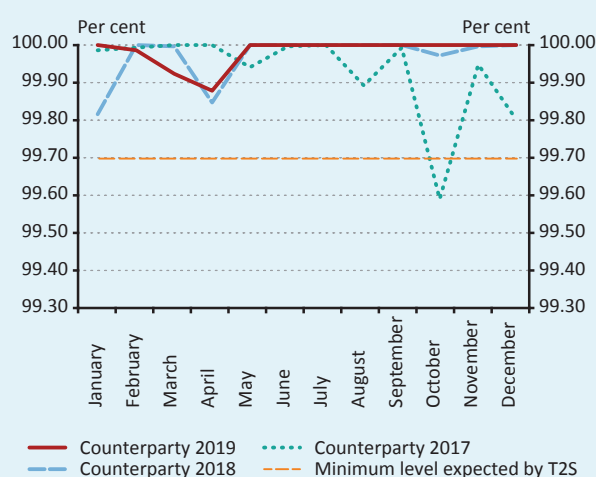
Data sheet

Chart 36
Number and value of transactions settled in KELER (2016-2019)



Source: KELER Ltd.

Chart 37
Developments in the monthly availability of KELER to counterparties (2017-2019)



Source: KELER Ltd.

¹⁸ According to MNB Decree 15/2010 (X. 12.), after 1 July 2012, the payment service provider of the payer (remitter) must ensure that the domestic forint credit transfer initiated electronically (until the last submission deadline) by its customers for same day settlement reach the beneficiary's payment service provider within 4 hours from acceptance.

3.5.1 Current events

In 2019, the total value of turnover settled in KELER rose by 23.5 percent compared to 2018, while the number of transactions was up by 8 percent. The total value of KELER's delivery versus payment (DvP) turnover rose by 35 percent, due to growth in the value of settlements carried out with Hungarian government securities in the second half of 2019. In 2019, the value of DvP transactions accounted for 85.1 percent of the total turnover, representing a growth of 7.4 percentage points compared to 2018, entailing a decrease in settlement risks. In 2019, the total value of transactions settled free of payment (FoP) decreased by 17.9 percent compared to the previous year, while the number of transactions rose by 13.3 percent. FoP transactions represent a lower transaction value than DvP transactions. Although the number of FoP transactions settled by KELER amounted to 70.8 percent of transactions in 2019, their share in terms of value was merely 14.9 percent.

In the European Union the operation of the central securities depository is subject to a CSDR licence, the obtaining of which has been also set by KELER as an objective. The licensing procedure has reached an important milestone: in mid-2020 the MNB established the completeness of KELER's licensing documentation. As of now, there are 20 central securities depositories in the European Union which have a CSDR¹⁹ licence. It is of key importance for KELER to obtain its CSDR licence, thereby also proving to the European Union and to the other Member States that it operates along the regulation laid down jointly. The licensing procedure has been lasting since 2017, which is partly due to the complex range of services provided by the Hungarian depository, including a limited credit institution function. It is a special feature of the situation that each institutional system usually has national characteristics, thus harmonisation with the EU standards and the transformation of legislative system may be time-consuming.

The programme launched by KELER at the end of 2018, aimed at the IT reform of the core infrastructure, reached a major milestone successfully in 2019 and it progresses towards putting the first phase in production mode in March 2021. As a result of this phase of the programme, key functions of the Hungarian capital market's core infrastructures will be based on modern IT fundamentals.

KELER has set the goal to place its operation gradually on new IT fundamentals in order to support the development of the Hungarian capital market. At the end of the first phase of KELER's Service Development Programme (KSDP), planned for 31 March 2021, securities settlement, static data management, fee calculation and statement generation performed by the Hungarian depository will be renewed, and infrastructural cooperation between KELER and the pan-European TARGET2 Securities system will also be modernised. In 2019, the specification and development of the individual system components has commenced, of which several sub-tasks have already been completed.

3.5.2 Risks

In 2019, the risk of KELER's service continuity has decreased compared to the previous year. The impact on customers of incidents affecting the IT architecture supporting business services can be primarily monitored through the availability ratio directly perceivable by counterparties (Chart 37). The availability ratio directly perceivable by customers did not fall below the generally expectable level in 2019. At present, this level is 99.7 percent, the minimum level expected by TS2, the TARGET2 Securities European settlement platform, and also from VIBER. Based on KELER's reports, the operation of systems supporting KELER's core services, such as the keeping of dematerialised securities accounts and gross settlements, was stable.

Similarly to 2018, in 2019 there were 5 incidents in KELER that affected counterparties, one of which lasted longer than two hours. Four of those incidents that affected customers were eliminated within 10 minutes, while the elimination of 1 incident took 124 minutes, where the error was of a unique nature. Until the detection and elimination of the problem the transactions were processed on the basis of the business continuity plan with the cooperation of the business area – KELER informed the counterparties through KID²⁰ and its website.

The transaction settlement risk declined in KELER due to the fall in turnover of FoP transactions, and the value of settlement failures improved compared to 2018, but the ratio of failed cash leg settlements is still high. During settlements, KELER executes the funds transfers and securities transfers of the parties to the transaction.

¹⁹ 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.

²⁰ KELER Internetwork System (hereinafter: KID or KID-KIS). The system facilitates that the KELER customers connected to the system can dispose over their various types of accounts held with KELER, through a computer (PC), leased line or modem and telephone line from their business site, i.e. send orders to KELER Ltd. and download account information (statements and balances) from the settlement systems of KELER Ltd.

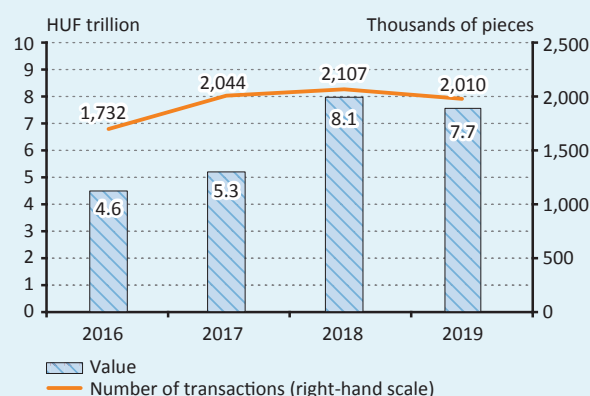
Clearing in line with the DvP principle considerably reduces the settlement risk of transactions. The reason for this is that payment and crediting of the securities does not take place until the funds necessary for performing the transaction become available. Only 3.22 percent of the total value and 2 percent of the total volume of transactions settled by KELER failed in 2019, which is an improvement compared to 2018. Settlement fails – irrespective of the underlying reasons – when the settlement of the securities transaction is not carried out or it is settled only partially at

the planned time of the settlement²¹ due to a shortage of securities or funds. From 2018 to 2019 the value of both the securities leg and cash leg settlements increased, but the number of settlement failures decreased at the securities leg of transactions, while it rose at their cash leg. In 2019, the failure to settle the cash leg of transaction accounted for 86.57 percent of the value of all failed transactions, exceeding last year's value by 4 percentage points. In 2019, the large majority of transactions involved in failed settlement were government bonds.

3.6 KELER CCP

Data sheet

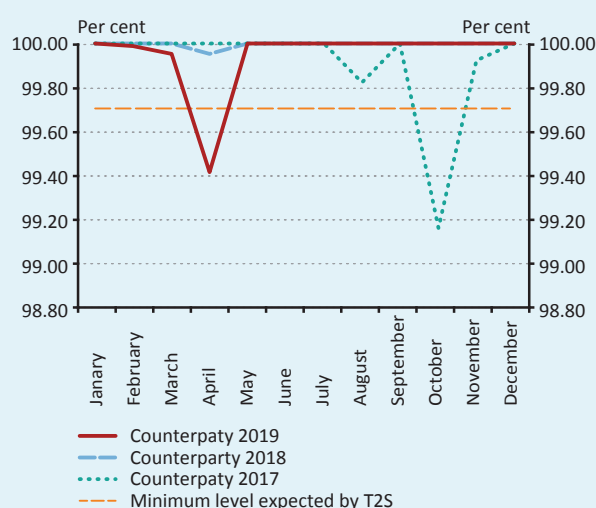
Chart 38
Number and value of transactions settled by KELER CCP in the capital market (2016-2019)



In respect of the 2017-2018 data related to the number of transactions: due to methodological changes there was a change in the data of former years. In respect of the 2018 data related to the value: due to methodological changes there was a change in the data of former years.

Source: KELER CCP Ltd.

Chart 39
Developments in the availability of KELER CCP to customers (2017-2019)



Source: MNB

3.6.1 Current events

In 2019, turnover of the markets cleared by KELER CCP fell by 2.14 percent compared to 2018; while there was strong growth on the spot gas market, the value of transactions cleared in the capital market fell by 4.6 percent. KELER CCP clears, as a central counterparty, financial instruments traded on the Budapest Stock Exchange, on the MTF markets²² and the domestic gas markets²³, and it provides

general clearing member services for its energy market non-clearing members for spot and forward electric energy, natural gas and emission quota products traded on ECC markets²⁴. In 2019, the total value of spot capital market transactions cleared by the central counterparty exceeded HUF 3,000 billion, representing a 9.5 percent decrease compared to the previous year and a 4.5 percent increase compared to 2017. Compared to 2018, a 1 percent decline (equalling some HUF 46.7 billion), was seen in total annual

²¹ Planned settlement date: the day recorded in the securities settlement system as settlement date, and set by parties to the securities transaction as settlement date by mutual agreement

²² MTF markets: BÉTa Market, MTS Hungary, Xtend, Xbond

²³ Gas markets cleared as central counterparty: Balancing market, Trading Platform, CEEGEX, HUDEX

²⁴ Energy markets cleared as the clearing member of ECC: HUPX, HUDEX, EPEX SPOT, EEX, Powernext/PEGAS, PXE

turnover of derivative capital market transactions. In the case of spot gas markets cleared as a central counterparty, turnover rose by 130 percent compared to 2018, due to which the MNB called upon KELER CCP to inspect clearing members more thoroughly. Forward gas markets contracted both in terms of the number and total value of transactions cleared. Last year, the total value of transactions cleared in this segment was almost 20 percent lower than in 2018. Contrary to previous years, turnover declined somewhat in services provided as a general clearing member; accordingly, the total value of transactions carried out in 2019 fell by 12.8 percent in the energy spot market and by 2.1 percent in the futures market compared to 2018.

Owing to its energy market services, KELER CCP also emerged as a dominant player in the Central and Eastern European region, while the profitability of energy market services made a major contribution to the company's earnings in 2019 as well. In the Hungarian natural gas markets, cleared as a central counterparty, a major upswing in trading turnover was observed in 2019, which generated liquidity management challenges for KELER CCP. However, by providing the appropriate liquidity funds, liquidity is continuously available, and owing to the risk management mechanisms the company incurred no loss. In order to standardise the clearing of the Hungarian natural gas market, due to the initiative of KELER CCP, clearing and financial settlement is carried out uniformly by daily settlement in euro from 2020, and balancing is permitted only for the clearing members of KELER CCP. Within the framework of KELER CCP's general clearing member services the market turbulences observed in 2018 ceased by 2019, and thus the service was able to function under normal market circumstances and moderate liquidity needs. KELER CCP – as a central counterparty holding EMIR licence – must comply with the EMIR requirements also in respect of general clearing member services, which poses major challenges for the company due to the fact that the risks characterising the service differ from those of the core activity.

In 2019, KELER CCP commenced the development of its settlement bank services. In 2020, three new settlement banks were introduced in addition to KELER, which reduced settlement risk. The developments offer a number of advantages to KELER CCP and to stakeholder gas and energy market non-clearing members. For KELER CCP the application of new settlement banks represents positive changes primarily in liquidity management: systemic risk decreases, concentration of KELER CCP's exposures to settlement banks declines, while the company's international competitiveness increases in parallel with the introduction of new service potentials of the settlement banks. Namely, the new settlement banks all have credit

institution licence, based on which they are able to provide a wider range of financial services to KELER CCP's clearing and non-clearing members than KELER operating with limited credit institution licence. With the new lending and liquidity supporting services KELER CCP can provide its customers with a more comprehensive, wider financial service package, also suitable for increasing customer satisfaction and reducing KELER CCP's default risks. The new settlement bank service is expected to commence in October 2020.

In 2019, the comprehensive supervisory review launched in the previous year was completed, and the annual College meeting was also held, where no risk influencing KELER CCP's operation was identified. In accordance with its obligations laid down in the Act on the Magyar Nemzeti Bank, in 2019 the central bank once again conducted an annual comprehensive supervisory inspection at KELER CCP as per the EMIR regulation. As part of this, the central bank identified shortcomings in connection with KELER CCP's risk management model and applied information technology. Following the inspection KELER CCP started to eliminate the deficiencies without delay. In addition, the annual meeting of the College, comprising international members, was held in October 2019, where the attendees discussed operational issues related to the central counterparty. The College identified no risk that would fundamentally influence the continued operation of KELER CCP.

3.6.2 Risks

KELER CCP developed new reporting and limit management rules to address its risks stemming from its general clearing member service. As part of the non-clearing member services, KELER CCP acts not as a central counterparty but as a general clearing member, and takes liability for the financial settlement of the specified energy market transactions toward the ECC and energy market non-clearing members, and finances the guarantee fund contribution obligation derivable from non-clearing members' trades. These financial liabilities must be financed from own funds, which may exert a major pressure on KELER CCP's capital position and funding opportunities in strained market periods. Since KELER CCP functions as a general clearing member, in order to ensure the monitoring of the intraday trading activities, it obtains information – with contribution from ECC – of non-clearing members' exposures from reports available and downloadable during the day. During 2019, KELER CCP has gradually integrated these reports into its risk management mechanisms, thereby making steps towards the comprehensive management of the risks resulting from trading by non-clearing members. With a view to restricting

the additional exposure of non-clearing members, KELER CCP developed its trading limit system gradually from 2017. The stock exchange platforms developed, in cooperation with ECC, a variety of trading limit systems to restrict trading as necessary, and KELER CCP also applies these limit systems in respect of its non-clearing members.

By 2019 KELER CCP's contribution obligation to the ECC guarantee fund declined considerably. ECC maintains a single guarantee fund in respect of all markets and products cleared and guaranteed by it. The consequence of this is that if turbulence develops in any of the markets, it may also result in additional guarantee fund contribution even for those participants that do not trade in the respective markets. From the beginning of 2019 the size of the guarantee fund and KELER CCP's contribution also declined gradually and returned to the usual band of EUR 3-4 million, staying there all year, and it started to increase only around the year-end. KELER CCP changed its business policy and capped the amount of the guarantee fund contribution from own funds in the amount of EUR 10 million. All contribution amounts exceeding this were allocated among and collected from the non-clearing members in proportion to the initial margin.

From 2020 clearing and guaranteeing of the Hungarian gas market's balancing transactions may be carried out only through KELER CCP, which leads to a rise in the number of the company's customers. Natural gas products with prompt physical delivery may be traded on the Hungarian Trading Platform (TP) and the CEEGEX spot gas market operated as an organised market, which are cleared by KELER CCP as a central counterparty. The special feature of prompt natural gas products with physical delivery is that they cannot be substituted and their storage life is also limited; moreover, access must be provided to the high-pressure natural gas system for suppliers and traders. The high-pressure natural gas transmission pipeline must be balanced constantly, and thus natural gas traders are also obliged to maintain the balance, failing which the system will become imbalanced. Maintaining the balance is the responsibility of the system operator, and thus if a participant becomes imbalanced, FGSZ Zrt. balances it on mandatory basis, by allocating the balancing transaction to the respective participant. These balancing transactions are cleared by KELER CCP and it also guarantees the financial settlement thereof. From 2020, as a result of the amendment of the Gas Act²⁵, financial settlement of the balancing may only take place through KELER CCP, and thus

the number of the company's gas market clearing members started to increase from the end of 2019.

Based on data provided by KELER CCP, the level of availability of KELER CCP's business activities to customers declined somewhat compared to the previous year. Nevertheless, the services continued to operate with high reliability. KELER and KELER CCP concluded outsourcing agreements for the operation of the IT systems, pursuant to which the IT architecture supporting KELER CCP's business services is operated by KELER. In 2019, the monthly average availability of KELER CCP's business services to customers was 99.954 percent, since only one malfunction occurred in 2019 which affected availability. The availability ratio directly perceivable by customers fell below the generally expected level only in one month. At present, this level is 99.7 percent, expected from TS2, the TARGET2 Securities European settlement platform, and also from VIBER. In the systems of KELER CCP, the availability ratio was also almost identical among business activities. A somewhat lower level was registered in the guaranteeing of multinet and gas market clearings, but even those exceeded the SLA level specified in the contract between KELER and KELER CCP²⁶ (Chart 40).

Chart 40
Developments in the availability of KELER CCP to customers broken down by business activities (2017-2019)



Source: MNB

²⁵ Act XL of 2008 on Natural gas supply

²⁶ The Service Level Agreement (SLA) is an agreement concluded by and between the service provider (KELER) and the client (KELER CCP) and it determines the minimum level of the service necessary for the client's standard course of business.

Although the number of delayed settlements rose in 2019 compared to 2018 among transactions cleared by KELER CCP, their value declined considerably, and thus on the whole the risk stemming from delayed settlement decreased.

The improvement in settlement discipline is obvious at the domestic capital market participants, which is in line with the MNB's expectations. These participants were responsible only for the smaller part of delayed settlements, which amounted to a total of HUF 5.9 billion, and they defaulted only on the securities leg, which usually were settled on the same day or on the second day after the planned settlement, at the latest. The absence of securities lending in the Hungarian market contributed significantly to defaults on the securities leg. Delayed settlements were mostly linked to OTC market activity. The energy market participants had purchase price and margin payment shortcomings, typically due to financial and liquidity issues, which usually were settled on the same day or on the sixth day following the planned settlement date, at the latest. Due to the stricter sanctioning of defaults and the regulatory technical standards on settlement discipline, entering into force on 1 February 2021, KELER CCP's default risk is expected to decrease further.

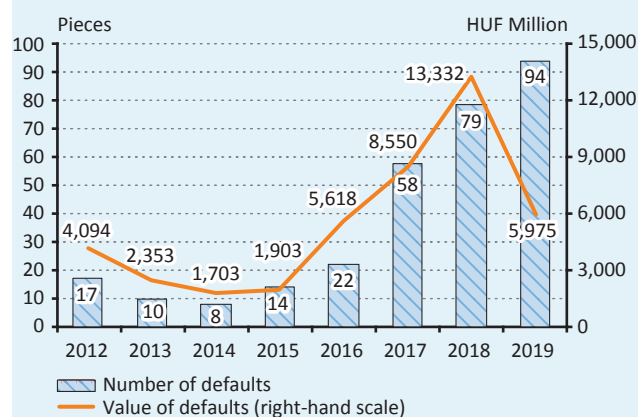
In 2019, the highest settlement risk was generated for KELER CCP by energy market transactions. Delayed settlement incidents in 2019 were linked to 14 participants and 3 markets. The reason for delayed settlement among energy market participants was the same; namely, they did not have sufficient liquid funds to discharge their liabilities. Each of the delayed settlements was connected to the spot energy markets; no delayed settlement occurred in the period under review in connection with the futures market. In 2019, delayed settlement occurred in the energy markets on 42 occasions in the total value of HUF 3.4 billion, of which HUF 2.9 billion related to the CEEGEX market, HUF 277 million to ECC trading and HUF 181 million to TP gas market trading. It is the special feature of the CEEGEX market that it is pre-financed, i.e. clearing members must pledge the purchase price in advance as collateral, and due to this upon a potential default on the purchase price, KELER CCP makes the settlement to the other clearing member from the collateral of the respective clearing member. Accordingly, the clearing member will default on the collateral after its financial default, and it will be suspended, but KELER CCP incurs no loss as a result of the default. Clearing members complied with the margin requirement same day, or on the next clearing day, at the latest. The TP market delayed settlements strongly concentrated around a single entity. Delayed settlements were fulfilled usually on the same day, but on one occasion

the missed obligation was fulfilled only on the sixth clearing day. KELER CCP operates a similar trading limit system in the TP market as in the CEEGEX market, and thus trading transactions are also prefinanced; accordingly, it is able to manage the potential default on the purchase price by utilising the collateral deposited. The delayed settlements related to the ECC general clearing member service are also concentrated around a single customer. KELER CCP was able to fulfil its obligations to ECC by utilising the collateral, and thus it incurred no loss in any of the cases.

The value of delayed settlements in the capital market decreased compared to 2018.

In 2019, delayed settlements in the capital market were related to the spot market in all cases; no default occurred in the futures market. Within the spot market, delayed settlements mostly occurred in the government securities' market, i.e. resulted from trading on MTS Hungary rather than of the equities traded on the BSE. Eighty percent of capital market delayed settlements took place on MTS Hungary, in the amount of roughly HUF 2 billion. As regards spot market equities, delayed delivery occurred in the total amount of roughly HUF 500 million, on a total of 49 occasions. It can be stated that in the capital market defaults and delayed settlements occur due to principals and non-clearing members rather than due to clearing members. Principals and non-clearing members included several major institutions recognised in the global capital markets. These institutions have operations covering a number of countries globally, and thus in the smaller markets, such as the BSE, they fail to pay attention to providing the proper securities collateral in due course. As a result, they miss the settlement deadlines, while clearing members cannot rely on mechanisms such as securities lending, which would facilitate timely settlements toward KELER CCP.

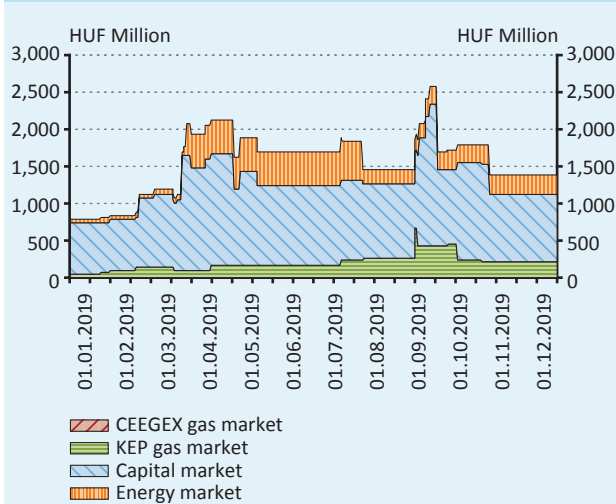
Chart 41
Defaults in the markets cleared by KELER CCP (2012-2019)



Similarly to 2018, the ratio of additional financial collateral imposed on capital market participants exceeded those imposed on energy market participants. With respect to the capital, gas and energy market transactions guaranteed by KELER CCP, the central counterparty has the option to impose additional financial collateral, depending on the type of risk encountered. This happens when required by risks related to the trading practice of the clearing member or the energy market non-clearing member, by inadequate liquidity or capital position of the participants or by insufficient contribution to the guarantee funds. It is cancelled when the underlying risk or the participant's legal relationship with KELER CCP ceases. In 2019, additional financial collateral was imposed 48 times and withdrawn 31 times. The year commenced with an additional financial collateral balance of HUF 804 billion, but by the end of the year it rose by 73 percent to HUF 1.4 billion. From the start of the second quarter strong growth can be observed, primarily due to the extra sanctions applied in the capital market and to repeated defaults. The balance peaked in September 2019 in the amount of HUF 2.6 billion, as a result

of the extra sanctions applied simultaneously in the gas and capital markets.

Chart 42
Value of the additional financial collaterals imposed by KELER CCP (2019)



Box 3

European developments and domestic impacts in the area of securities infrastructures

As regards the international regulations, in 2019 several legislative changes occurred and related initiatives were taken, which also affect the functioning and activity of the Hungarian securities infrastructures. Of these, in connection with the central counterparties, it is worth noting the (EMIR) regulation on OTC derivatives, central counterparties and trade repositories. In 2019 two guidelines of the European Securities and Markets Authority (ESMA) were also published, the implementation of which was reported by the MNB to ESMA.

In connection with EMIR, several amendments were made in 2019, of which the later amendment, adopted in December and entered into force on 1 January 2020, is more important for KELER CCP. The novelties in the amendment adopted in December – also referred to as EMIR 2.2 – caused changes in, among other things, the ESMA committees and validation procedures as well as in the composition and competence of the colleges. Pursuant to the amendment, major changes were introduced in the validation procedures and in the procedures conducted with the Colleges and ESMA, as a result of which ESMA's CCP Supervisory Committee was set up (hereinafter: CCPSC). CCPSC provides ESMA with greater competence during the validation procedures before the College decides on them. The revised procedure supports a more standard operation in order to eliminate differences and arbitrage possibilities. The main change in the Colleges is that their members may be supplemented with additional national competent authorities, central banks, and that from now on ESMA will be represented in them by the Chair of CCPSC. In addition, ESMA was supplemented with one more committee, the ESMA CCP Policy Committee. Its duties differ from those of CCPSC in the fact that while in the case of the latter the duties appear at the level of experts, in the case of the first they are handled from the perspective of policy making. In addition to the above, amendment 2.2 of EMIR was also supplemented in respect of third country central counterparties. On the other hand, the detailed rules are yet to be developed, since the European Commission will have to elaborate a precise implementing regulation with regard to the systemic risk ratings of third country central counterparties by January 2021, which will clarify the aforementioned amendments.

In 2019, ESMA issued two guidelines concerning central counterparties, which were implemented by the MNB in the first half of 2020 in the form of MNB recommendations. One of guidelines was about the management of the conflict of interest at central counterparties, which was necessary, among other things, to create an EU framework for the definitions and the methods of managing potential and real conflicts of interest. The second guideline was aimed at EMIR's measures related to margin requirements to limit procyclicality, where the EU minimum requirements were also clarified in connection with this. These include the regular assessment of procyclicality, the application of margin measures to limit procyclicality for all risk factors, the use of the margin buffer under the relevant EMIR implementing regulation, the method of calculating the minimum margin value and the minimum requirements pertaining to the disclosure of margin parameters.

4 Special topics

4.1 INTRODUCTION OF THE INSTANT PAYMENT SYSTEM

4.1.1 Launch of the instant payment service

On 2 March 2020 the instant payment service was launched successfully in Hungary, which may fundamentally change the payment habits of households and corporations. After rescheduling the launch of the instant payment system in May 2019, the MNB, in cooperation with GIRO, placed even greater emphasis than before on supporting and closely monitoring the preparation of system members to ensure that the risks arising at their end as well as the potential development and testing problems can be addressed efficiently. In autumn 2019, intensive testing commenced within the framework of a mandatory trial operation in production mode, during which system members had to execute tasks defined in detail both in the test and production systems. The purpose of this was to ensure the finalisation of system developments and settings in an environment that is as close to real operation as possible. When the instant payment service was introduced to customers, the MNB monitored the system members switch-over in real time to ensure the handling of potential incidents as soon as possible; however, no central intervention was necessary. As a result of the above, the instant payment system was launched successfully, and this is the beginning of a new era in Hungarian payment services, revolutionising the handling

of everyday financial matters from the very start. At the same time, this is only the first stage of a new chapter, since the range of innovative payment solutions built on the central infrastructure is expected to broaden continuously, offering increasingly high service quality to customers and fundamentally changing payment habits in Hungary.

The system operates adequately since the start, properly managing the sending and receiving of transactions with incidents occurring only occasionally, affecting only a few customers and not having a major influence on the core operation. Although in the first days after the launch minor temporary problems did occur at the side of a few banks; however, the concerned system members were able to manage them every time, thereby minimising the ratio of affected customers and failed transactions. The central infrastructure has been operating without any problems since the start. In the first three months 27.2 million credit transfers were executed between banks in the total amount of HUF 3,838 billion (Chart 43). The outbreak of the coronavirus pandemic as well as intra-month seasonality affected the turnover, these being responsible for the differences between the individual weeks and months. 99.6 percent of transactions were carried out successfully within 20 seconds. Within this, the large majority of transactions, i.e. 98.8 percent, were executed within the 5 second limit prescribed by the regulation; moreover, 93.5 percent of transactions were executed within 2 seconds (Chart 44). A large part, roughly one third, of credit transfers were carried out outside the operating hours of intraday

Chart 43

Main transaction data of the instant payment system in the period of 2 March 2020 - 31 May 2020

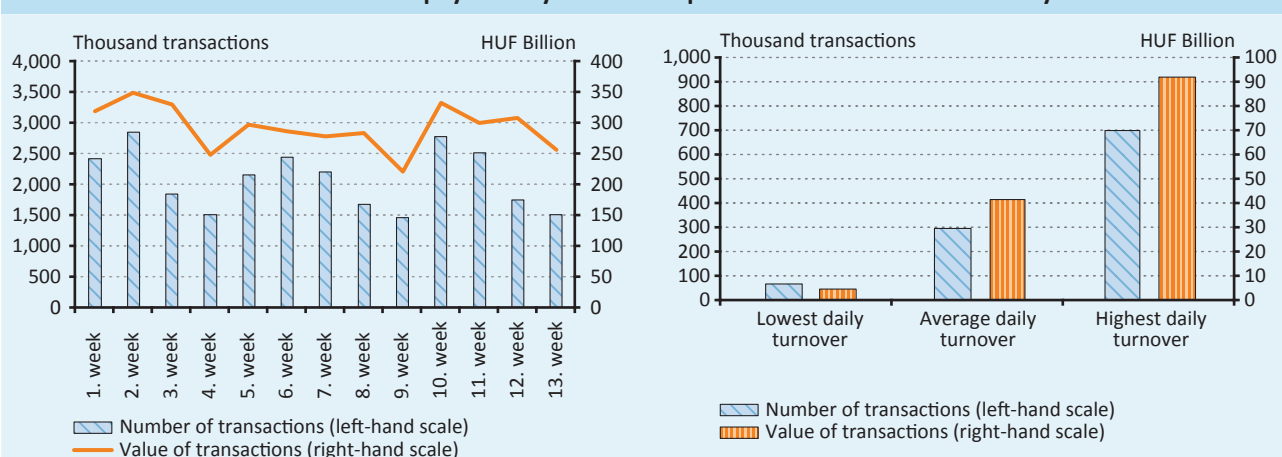
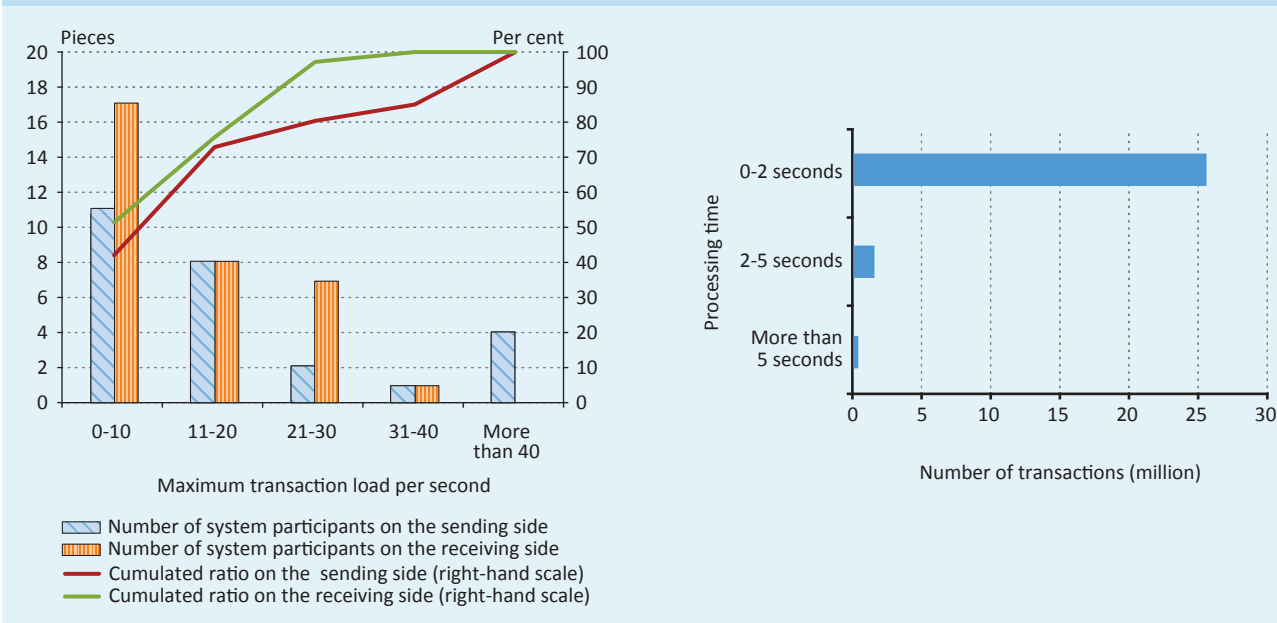


Chart 44

Main features of transaction processing in the instant payment system in the period of 2 March 2020 - 31 May 2020



clearing – i.e. at night, on weekends and public holidays – which partly signals that changes in the payment habits of customers can be perceived already from the start. In addition, in the first three months customers registered roughly 55,000 secondary account identifiers, and this degree of interest may substantially support the spread of innovative services built on this system.

4.1.2 Future of the instant payment system: innovative services

In order to ensure the wide-ranging spread of electronic payment services, it is of key importance to ensure interoperability between the services and avoid closed, insular solutions. With a view to supporting further penetration of electronic payments efficiently, new, innovative payment services must be created in such a way – particularly in respect of the purchase situations and bill payments – that upon paying at a merchant or service provider customers do not need to connect specifically also to the payment service available in the respective situation, and thereby use several parallel services. It should be sufficient to use the payment solution preferred by the customer, which thus provides a relevant alternative for carrying out the transactions in all situations. The introduction of instant payments supports this objective, since it has established a core infrastructure, through which all domestic customers having a payment account have

become available to all payment service providers and other institutions delivering payment solutions. Furthermore, the interoperability of supplementary payment solutions, built on the core infrastructure of the instant payment system, is also ensured.

Interoperability of instant payment services is ensured by the guidelines published by the MNB in July 2019. The guidelines of the MNB facilitate that market participants can create wide-ranging payment solutions built on uniform technical bases. The guideline on payment process²⁷ presents in detail the way instant payments can be executed in various payment situations and the information flow between participants of the payment cycle in the individual steps. Considering these process descriptions, the developers of new payment solutions can create their services faster, thereby simplifying their market entry, and they can also ensure the creation of uniform payment process with their services at the side of all customers. Namely, in this way irrespective of the bank providing services to the customer and of the mobile payment solution used, purchase transactions in shops or online, payments for services in person and also bill payments can be carried out in the same process.

The QR code standard published by the MNB²⁸ ensures the interoperability of mobile payment services built on the instant payment system. In the case of a mobile

²⁷ <https://www.mnb.hu/letoltes/fizetesi-folyamatok-utmutato-20190712-en.pdf>

²⁸ <https://www.mnb.hu/letoltes/qr-kod-utmutato-20190712-en.pdf>

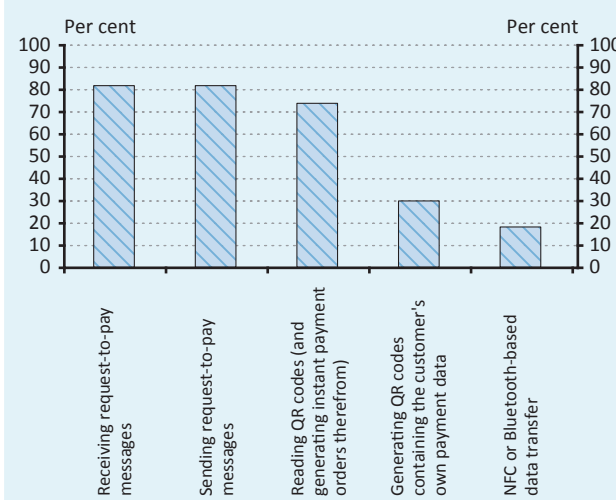
payment service the input of data necessary for identifying the beneficiary and initiating the payment can be achieved in several ways. Fully manual data input can be carried out in a simple way at low cost, but due to the time required for use it is not always a feasible solution. On the other hand, the Bluetooth or NFC solutions, similar to payment cards, often require deeper integration, longer and more costly development, despite the fast use. QR code-based data input provides a solution for all these problems, as the development need of it is low and minimum cooperation is required from the customer to read and display the payment data. Accordingly, the transfer of data necessary for the initiation of instant payments or request-to-pay can be solved in any payment situation. Through the standard QR code any service provider can be sure that the respective customer can read the payment data displayed in its payment-related services (e.g. initiation of payment, billing) using his own mobile payment application, irrespective of the provider thereof.

Merchants and service providers with smaller turnover are already able to provide the option of electronic payment with the use of secondary account identifier, without additional development or the use of special services. For this they merely need to register a secondary account identifier (mobile phone number, e-mail address or tax number) and inform their customers of this. Customers – owing to the mobile banking services suitable for initiating instant payments, widely available already now – can initiate the transaction specifying this data in their mobile banking application upon payment, on the receipt of which the entrepreneur can obtain information in its own mobile banking application. Although this solution necessitates a higher degree of cooperation by the payer, electronic payment can be introduced through this without any additional cost. This may represent a solution in situations where the card payment or integrated instant payment, requiring greater investment and being more costly, would result in excessive burdens for the entrepreneur, but the nature of the activity facilitates the execution of the slightly longer payment process, resulting from the data transfer and transaction verification.

Banking developments in progress will facilitate the simple implementation of instant payments also for bill payments and online purchases within a few months. In recent years, Hungarian banks primarily focused on creating the core functions of the instant payment; however, according to the MNB's survey performed in January, developments that will further expand and simplify the use of instant payment are already in progress at several participants. Based on the survey, by the end of 2020 the request-to-pay service and the reading of QR codes will be available to the large

majority of customers, and the customers of several banks will be also able to use QR codes to display their own payment data. It should be noted that these services may be provided not only by payment service providers but also by other types of service providers, which for example offer payment related solutions, operation of cash registers or electronic billing services to merchants or bill issuers.

Chart 45
Planned introduction of services based on instant payments at the banks in 2020, as a ratio of the available retail and corporate accounts



4.1.3 Fraud prevention in the instant payment system

It is the common interest of the MNB and the Hungarian banking sector that the instant payment service, revolutionising domestic electronic payments, is used widely by customers; however, the safety of the use of the service is essential for this. The MNB, having consulted the operators of foreign instant payment systems and the Hungarian banks several times, assessed the risks of payment frauds. Based on the domestic and international experiences, two main types of fraud events can be identified in payments. One of them is the misuse of personal authentication data, when after acquiring the authentication data, fraudsters have access to a customer's payment account and thus they can initiate credit transfers, thereby cause damages. On the other hand, there are fraud events based on deception, when fraudsters somehow persuade the customer to send an amount not to the proper payment account number (e.g. the payment account number of the customer's utility service provider has changed, and thus payments have to be made to a different payment account), or citing an untrue reason they swindle money out of them (e.g. the customer's payment account has been closed, and thus the total balance must be

transferred to a different payment account, which has already been created for the customer by his bank).

Although none of the frauds is linked solely to the instant payment service, the implementation of any system of this magnitude may carry additional risks through raising the interest of criminal groups specialised in payment frauds.

At present the misuse of personal authentication data is extremely rare in Hungary, and based on the international experiences, this type of risk has not increased in the already functioning instant payment systems either. At the same time, fraud events based on deception – irrespectively of the introduction of instant payment systems – spread rapidly internationally; however, in Hungary the occurrence of this fraud type is still negligible, despite the fact that even the lead time of 1-2 hours, typical for the domestic intraday clearing system, is short enough to provide room for the attempts. For the time being no regulatory intervention has been made anywhere in the world to address this type of fraud; at the same time, wide-ranging customer education campaigns have been launched on a preventive basis in a number of countries. In addition, several countries plan to operate central fraud monitoring systems, which help detect also these incidents more efficiently. There are also ongoing analyses in Hungary with regard to the possibility of implementing a similar central monitoring system.

The MNB strictly monitors the safe operation of domestic payments, which is contributed to by the fact that banks must comply with a number of statutory requirements in the area of fraud prevention. Based on the regulations, payment service providers must have, among other things, fraud monitoring systems, which facilitate the detection of unauthorised payment transactions and monitor the already unsecure or stolen authentication elements, the amount of payment transactions, the known fraud scenarios and the signs suggesting that IT devices may be infected by malware. Although according to the guideline of the European Banking Authority it is not necessary to operate the monitoring systems in real time, the MNB expects Hungarian payment service providers to use real time solutions in view of the introduction of the instant payment system. Bearing this in mind, the majority of system members plan to implement a real time monitoring system or have already realised it. In addition, the application of strong customer authentication has become widely mandatory²⁹, based on which upon the electronic initiation

of payments, online access to payment accounts and other transactions that may facilitate payment-related frauds, it is mandatory to apply strong customer authentication or the statutory exception and at the same time to use real time risk analysis. This may contribute to reducing further the misuse of personal authentication data, which has been extremely low to date.

In order to ensure that the risks of fraud do not increase in connection with the introduction of instant payments, the MNB informed domestic payment service providers on the best practices to be applied, in a management circular.

Faster payment transactions necessitate that Hungarian payment service providers also use more efficient, real time fraud prevention and detection mechanisms, which monitor and analyse – in addition to the static rules and blacklists – their customers' behaviour and payment habits. Further favourable measures to be taken by banks may include the implementation of innovative fraud prevention technologies, such as the monitoring of the typing speed and cursor movement of the customer. In parallel with this, it is also important that banks monitor mass instant payment transactions of unusually high number initiated from or received on a single payment account, and support the stopping of these transactions and the blocking of the involved payment accounts, as necessary.

The MNB expects banks to raise the awareness of their customers and cooperate with each other to prevent frauds.

Providing customers with information on a continuous basis and increasing their security awareness and vigilance is key to keeping the level of frauds low. The MNB firmly expects domestic payment service providers to conduct wide-ranging educative customer information campaigns on the instant payment system and on the features and risks of the new service in order to strengthen customers' financial awareness. In addition, payment service providers must make efforts to cooperate and share with each other immediately the information implying frauds related to instant payments, in order to identify frauds as soon as possible and support prevention.

Payment service providers must also pay special attention to the prevention of frauds related to the requests-to-pay service. Although the extensive spread of the request-to-pay service³⁰ is expected to take place gradually, and due to the regulation it is also not possible to send batched

²⁹ When applying strong customer authentication, during the authentication of the customer, the customer must provide two of the authentication factors allocated to three categories for the authentication to be successful. The first category of authentication factors includes the customer's "biological attributes", the second category includes the customer's "knowledge", while the third category includes the "device possessed" by the customer.

³⁰ Request-to-pay messages contain all data necessary for the initiation of instant payments, thereby making it possible that the party receiving the request can initiate an instant payment in response to the request in a simple way, only by pressing a button.

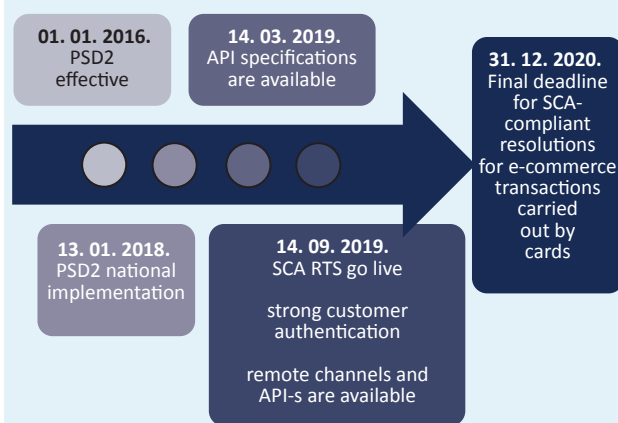
request-to-pay messages before 1 September 2020, and even after 1 September 2020 this will be possible only at a limited transaction load by receiving banks, the MNB expects payment service providers to prepare for the management of additional risks as soon as possible. This is necessary because – irrespective of the introduction of the instant payment system – frauds based on deception are expected to spread in the future, in the case of which it emerges as a risk that fraudsters can target a large number of customers in a short time by the automated sending of requests-to-pay messages. Accordingly, it is important that fraud monitoring systems also monitor the turnover of the request-to-pay messages. As part of this, it is recommended to monitor the unusually large number of mass messages sent by a single customer, and depending on the result of the investigation, payment service providers should be capable of disabling suspicious senders. Furthermore, customers should be enabled to report or disable senders they deem suspicious. In addition, considering the risk attributes and payment habits of certain customer groups, it is also possible to define limits even for the number or total amount of request-to-pay messages that each customer may send within one day.

4.2 IMPACT OF THE NEW PAYMENT SERVICES DIRECTIVE (PSD2) ON HUNGARY

From 14 September 2019, Hungarian payment service providers must apply also the last detailed rules of PSD2 on a mandatory basis. The purpose of PSD2, in addition to provide customers with more efficient protection, is to create a regulated environment for the development of digital financial services and support the entry of new, non-credit institution service providers to the market of payment services. Due to PSD2, activities not regulated before were added to payment services (account information³¹ and payment initiation³² services), and security – primarily IT security – expectations towards payment service providers were tightened significantly. The most important changes in the area of security include data transmission connection and strong customer authentication, and increased security of payments was set as an objective, in view of online payments' high degree of penetration. Furthermore, it should be noted that for credit institution payment service providers it is not mandatory to appear in the market also as third party providers offering open banking as a service,

but they are obliged to develop a safe and stable access interface³³ (API) and make it available to third party providers. In addition, account-keeping payment service providers also had to provide testing tools and technical development documentation for the APIs by March 2019 to ensure that new participants have sufficient time and opportunity for the preparation. Furthermore, it should be noted that in the case of online payment transactions initiated by bankcard, additional time has been allowed for the preparation due to the complexity and difficulties, also reported at European level; nevertheless, the MNB – in line with the current position of EBA – continues to encourage domestic participants to use the appropriate authentication procedures as soon as possible also for these payment transactions (Chart 46). It contributed to the compliance with and proper application of the laws transposing PSD2 in the Hungarian legislation and of the detailed rules that, with the involvement of the Hungarian Banking Association, professional consultations between the sector and the MNB took place on a continuous basis.

Chart 46
Key milestones in the application of PSD2 and the detailed rules



4.2.1 Developments in the area of security

Security is one of the focus points of PSD2; accordingly, due to the increasingly spreading and popular electronic payments, the security level must be enhanced, and one way to achieve this is the multifactor strong customer authentication. Strong customer authentication serves the protection of users of payment services by introducing

³¹ Account information service is an online service to provide aggregated information on one or several payment accounts, which were opened by the users of the payment service at another payment service provider or at several payment service providers.

³² Payment initiation service is a service aimed at initiating a payment order at the request of the user of the service in respect of a payment account held with another payment service provider.

³³ This interface facilitates that these new service providers can communicate with the payment service provider keeping the account of their customer through a secure channel.

an additional security verification step, thereby realising two-factor authentication. Namely, it prescribes the simultaneous use of at least two authentication elements of different types selected from the three possible categories of authentication elements (knowledge, possession, inference) (Chart 47). Based on the rules that were in force and applicable before 14 September 2019, it was sufficient to use only one factor for customer authentication for all payments. Namely, e.g. upon making a credit transfer through the internet bank, after entering the system by providing a static password (specified by the customer) it was possible to initiate a transaction without the use of any further authentication element (e.g. one-off password sent in SMS, token-generated password or QR code). However, in order to enhance security, payment service providers already ask for additional authentication, other than the password, for the initiation of transactions. Strong customer authentication also helps prevent abuses: for example, even if one authentication element of the customer (e.g. the static password) is acquired through phishing, the knowledge thereof is not sufficient for the initiation of a credit transfer, since an additional factor (e.g. fingerprint) is also necessary for payment initiation.

Chart 47
Authentication elements applicable in the course of customer authentication



Source of pictures: iStock

The authentication procedures of account-keeping payment service providers usually prescribed the simultaneous use of two factors for credit transfers before as well, but in the area of online payments it is necessary to change the currently common and applied solution by the end of 2020. In the case of online bankcard payments difficulties arose across Europe in connection with strong customer authentication complying with the regulations. Namely, the technical solution applied at present in the area of online

payment transactions via the internet, initiated by payment cards, from 14 September 2019 no longer complies with the requirements pertaining to strong customer authentication. Until now it was sufficient to provide the data indicated on the bankcard (cardholder's name, card number and CVC code) to execute online e-commerce payments carried out by cards, but now, according to the detailed rules on strong customer authentication, these no longer may be accepted as authentication factors. At the same time, the MNB – in line with EU practice – provided additional time for preparation until 31 December 2020 to realise implementation in line with the legislations, in accordance with the decision of the European Banking Authority related to the final deadline. Nevertheless, the MNB encourages domestic participants to use the appropriate authentication procedure in the area of online e-commerce payments carried out by cards as soon as possible, thereby increasing the security of payment transactions. Strong customer authentication is good for the customer, because it ensures that even upon losing the bankcard (or other device to be used for payment, e.g. mobile phone) only the authorised cardholder can authenticate the transaction. Furthermore, it protects him as a cardholder, in view of the fact that in the event of losing the bankcard, it is not sufficient to use only the data indicated on the bankcard during online e-commerce purchases, but one further authentication element must be also used.

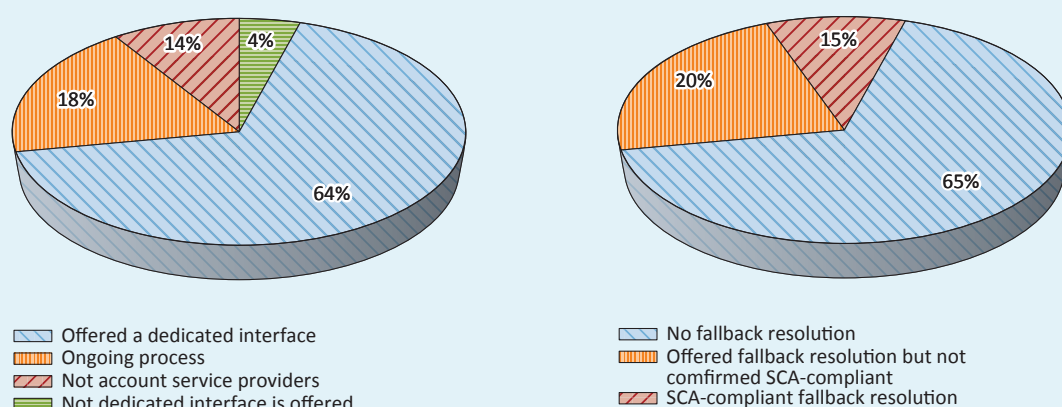
4.2.2 Preparedness of the Hungarian banking sector

The MNB treats with top priority the inspection of whether the account payment service provider ensures access to customer account for third party providers. In November 2019, the MNB inspected the fulfilment of the requirements formulated in the strong customer authentication RTS within the framework of extraordinary data reporting. Within the framework of this, it placed special emphasis on inspecting whether the account-keeping payment service provider has at all the interface complying with the statutory requirements, and whether upon using a dedicated interface it has created a contingency mechanism complying with the Commission Regulation on strong customer authentication³⁴ (RTS). The latter ensures that access by third party payment service providers to payment accounts is not hindered by the IT incidents of account-keeping payment service providers. Furthermore, payment service providers also had to make a declaration whether the interface provides the same availability and performance at all time as the interfaces provided to customers, accessible directly online,

³⁴ Commission Delegated Regulation 2018/389/EU of 27 November 2017 supplementing Directive 2015/2366/EU 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.

Chart 48

Preparedness of the affected Hungarian sector in respect of the interface (left-hand chart), and the fallback mechanism (right-hand chart) based on the extraordinary data reporting (survey of November 2019)



whether the identification and authentication procedure are appropriate, whether the statistical data are properly published, whether the performance indicators are available and whether the business continuity disaster recovery plans have been completed.

Based on the data reporting prescribed by the MNB, the sector is essentially well-prepared for the application of the provisions of the Commission Regulation on strong customer authentication; shortcomings occurred mostly in relation to the development of the contingency mechanism. Based on the responses sent for the extraordinary data reporting, although 80 percent of those concerned provide an interface (usually in the form of a dedicated interface) for third party service providers, the operation of the interface with full functionality is not always guaranteed for their account-holder customers. In addition, 65 percent of those obliged, failed to develop the fallback mechanism that ensures the continuous availability of the interface, and in the case of further 20 percent of them it cannot be established beyond doubt whether the development fully complies with the statutory requirements (Chart 48). The law permits that the account payment service provider institution may be exempted from the development of the fallback mechanism, if it proves, among other things, that the interface operated by it operates with high availability, like the interface offered directly to its account-holder customers (e.g. internet banking interface). To date, the MNB provided 3 institutions with exemptions; based on the answers received in response to the data reporting ordered by the MNB related to production data, the performance indicators and target values of their dedicated interfaces were in order during the operation.

4.2.3 Presence of new service providers in Hungary

The presence of third party providers rendering the innovative services of PSD2 is not significant in the Hungarian market; until now, the MNB registered only a few account information providers; at the same time, there is strong competition among banks in the area of these new services. Although in the wake of PSD2, payment service providers operating as payment institutions providing account information and payment initiation services appeared in Hungary as well, their number is negligible and their actual activity has not yet commenced widely. In addition to these two new actors of the payments market, there are also payment service providers issuing card-based cash substitute payment instruments, but we have no knowledge of such service providers. In the case of payment institutions, prior to commencing their account information and payment initiation services, registration and licensing procedures are conducted at the MNB. In view of the fact that the registration procedure does not differ from the licensing procedure in terms of their content, hereinafter we refer to these two procedures uniformly as licensing procedure. Based on their previous licence, credit institutions are also authorised to provide the new payment services, but not all credit institutions took advantage of the opportunity of open banking. However, credit institutions may as well provide their services to each other's customers in such a way that customers do not need to open an account at the other credit institution, thereby increasing competition. The MNB registered five domestic payment service providers operating as payment service institution providing account information services³⁵; however, for

³⁵ One third-party service provider applied for the cancellation of the account information payment service provider licence in 2020.

the time being no licence has been issued to any payment initiation service provider. The website of the MNB³⁶ provides information on third party service providers. The data of third-party service providers, also rendering service in other EU Member States can be enquired on and verified in the central, authentic service provider databases (registers).

In respect of the applications and documents submitted by third party service providers, the MNB found that during the licensing procedures several supplementation rounds were also necessary, and recurring, typical shortcomings occurred, which implies that the majority of applicants found the regulation difficult to interpret. During the administrative procedures to date, licences were typically issued only after complying with several calls for supplementation, because third party service providers did not manage to comply with the requirements in full even after the issuance of the resolutions ordering repeated supplementation. It is a typical shortcoming in the case of account information service providers that they fail to stipulate properly in their own general terms and conditions the type of data necessary for the respective services. Namely, although the account-keeping institutions must make all data related to the payment account available to the account information service provider – in line with the data protection laws – they may have actual access only to those that are absolutely necessary for the provision of the service. The data outside this range qualify as sensitive payment data and access to those is prohibited. Furthermore, it should be noted that the payment service providers rendering payment initiation services must comply with stricter rules than the account information service providers, and thus it is a frequent shortcoming in the general contractual terms of these providers that the provisions ensuring compliance with the Payment Services Act³⁷ and with the MNB Decree on Payment Services³⁸ are missing. Furthermore, the assessments from IT perspective found at both types of service providers that in the first round the contingency plans ensuring business continuity and the documents related to the testing of those were missing, and no recovery times and restore points have been defined, and the architecture plans presenting the IT system together with the data connection have not been submitted either. In addition to the above, third party providers often failed to identify their critical business processes and omitted the presentation of how they ensure

that unauthorised persons have no access to sensitive payment data.

4.3 TRANSFORMATION OF THE PAYMENT SERVICES MARKET

The largest ratio of fintech service providers try to enter the area of payments within the market of financial services.

Capital invested in fintech enterprises active in payments increased continuously in the past years, coming close to USD 78 billion in 2019³⁹. One reason for this may be that there is huge demand from customers for modern payment solutions, but the traditional payment infrastructures and banking actors were not able to satisfy this due to their long processing time and limited opening hours. Taking advantage of this, fintech enterprises try to enter the payment services market in several ways, primarily with solutions offering higher service levels (e.g. mobile payment applications) or with innovative solutions focusing on smaller sub-markets (e.g. cross-border money transfer) or with more favourable and transparent pricing compared to traditional payment service providers. It can be identified as an additional direction that they build independent – typically electronic money-based – closed systems, which, evading the traditional infrastructures, try to solve the market problems by creating their own sub-market. For further information on the analysis of fintech services market, see the MNB's FinTech and Digitalisation Report.

Traditional banking actors can preserve their competitiveness only through ongoing developments.

The introduction of instant payment systems represents a substantially more complex development than the directions presented above, since it equally covers the comprehensive reform of the underlying infrastructures and the development of innovative payment services provided by market participants to customers. These systems have already started or are under development in almost all countries with advanced payment services. Their importance for the banking sector is indicated by the fact that instant payment makes it possible that even the traditional market participants can offer the same level of payment services as the new fintech enterprises. Accordingly, in the medium run the maintenance of the banking sector's competitiveness may also largely depend on how active banking actors are in the development of supplementary services based on instant payments.

³⁶ <https://intezmenykereso.mnb.hu/>

³⁷ Act LXXXV of 2009 on the Provision of Payment Services

³⁸ MNB Decree 35/2017 (XII. 14.) on the Execution of payment transactions.

³⁹ KPMG: Pulse of Fintech H2 2019 - <https://assets.kpmg/content/dam/kpmg/xx/pdf/2020/02/pulse-of-fintech-h2-2019.pdf>

Table 1

Review of the main directions of payment developments from the perspective of traditional infrastructures

		Key features of the solutions	Examples of services available in Hungary
Relation to the traditional infrastructures	Use of traditional infrastructures	<ul style="list-style-type: none"> revising the long and costly processes of traditional infrastructures typically in a special segment (e.g. cross-border credit transfers) faster and often cheaper solutions, but without comprehensive development, only trying to improve the basic customer experience may result in the fragmentation of payments (parallel payment solutions for different payment situations, which may necessitate the use of several services simultaneously, and the sharing of liquidity among them) 	TransferWise
	Solutions built on traditional infrastructures	<ul style="list-style-type: none"> solutions typically based on card payment, aiming to improve customer experience (primarily mobile wallets with digitised cards) improving user experience, but development is performed only in respect of the service level, and thus they are unable to overcome the limits of the traditional card infrastructure (e.g. the merchant gets the money only later, limited payment situations, need for expensive collateral scheme) new participants in the existing payment process, which makes the functioning of the system more complex and may result in additional costs 	Apple Pay Google Pay Simple by OTP
	Solutions evading traditional infrastructures	<ul style="list-style-type: none"> resolving the market problems by own, closed systems, which may create high barriers to market entry for the new entrants it is not necessary to wait for others in respect of the developments, and thus instant payment within the system is available the creation of closed systems may result in oligopolistic or monopolistic market structure, which may lead to liquidity strains (due to the fragmented market structure several solutions must be used simultaneously and share liquidity among them to cover all payment situations) 	PayPal Revolut Barion Alipay
	Complete reform of traditional infrastructures	<ul style="list-style-type: none"> maximum utilisation of the technological opportunities through the complete reform of the traditional infrastructures, which opens the way for innovation without hindering competition and thereby for the significant improvement of customer experience identical conditions for the new and existing service providers to enhance efficiency, reduce costs and improve competitiveness opportunity to create fast, cheap and interoperable solutions provides electronic alternative in a number of payment situations where formerly only cash payment could be used; at the same time, complex additional developments may be necessary in many cases to guarantee proper customer experience, which may result in prolonged implementation and rollout in view of the large number of stakeholders (e.g. payment service providers, developers of cash registers and other devices essential for the payment processes, merchants) 	Instant payment

The appearance of central bank digital currency may fundamentally transform the entire financial system, including payment services; however, additional detailed analyses are required in order to survey the related impact comprehensively. Central bank money in electronic form at present is available only to those financial institutions the accounts of which are kept by central banks. In addition to other considerations, this also has technological reasons, because until now only cash in physical form has been able to support payment transactions carried out by several

millions of users. However, as a result of the IT development of the recent period, purely from a technological perspective it has become possible for central banks to make central bank money available in digital form even to private individuals. Accordingly, a number of countries have started to investigate the opportunities inherent in the introduction of central bank digital currency; however, due to the extremely diverse effects, additional investigations should be carried out, in respect of, among other things, payment, monetary policy and financial stability issues.

At present, central banks see an opportunity primarily in developing countries for enhancing the efficiency of payments by introducing central bank digital currency⁴⁰; however, the coronavirus pandemic highlighted the need for spreading electronic payment solutions, in parallel with which projects aimed at the analysis of the topics related to central bank digital currency and the assessment of possibilities to introduce it may gain new momentum in several countries. Although in the short run central bank digital currency to become reality may be expected only at a few places, the coronavirus pandemic may encourage central banks to deal with the issue more deeply in connection with curbing cash turnover and supporting the penetration of various electronic payment methods. In this regard China is in the vanguard, working on the introduction of central bank digital currency since 2014. It appears that the coronavirus pandemic further accelerated the progress of the project, as live tests commenced, albeit only to a limited degree for the time being and only in certain provinces of China. At the moment, little is known about the applied technology and the specific role of the planned solution; however, the commencement of the first phase of implementation is an excellent opportunity to collect practical experiences for determining the directions of the next steps: as part of this first phase, in one of the provinces participating in the test part of the travel allowance of public servants will become available in central bank digital currency in a dedicated mobile phone application. In addition, the intensity of the projects conducted by several central banks to examine the introduction of central bank digital currency has increased recently, and those countries that until now placed only minor emphasis on the analysis of the introduction of central bank digital currency (e.g. the US, the Netherlands) also started to assess the possibilities in more details. In Europe the Swedish Riksbank is in the vanguard, the principle of which in connection with the establishment of the project was that the usage of cash has decreased to a large degree in the country, and due to this the limitation of the payment function of the presently widely available central bank money (cash) in practice arose. Riksbank issued its first project report in 2017, which outlined primarily the basic problem; however, by early 2020 it already reached the phase of presenting the first description of their pilot programme. Based on this it plans to test a solution based on distributed ledger technology (DLT).

In countries that conduct experiments with the central bank digital currency, in addition to the payment efficiency factors the achievement of several other potential

objectives is also assessed. Additional payment objectives include the assessment of possibilities to enhance the security of payments, through which it may as well be possible to reduce frauds directly affecting consumers, related to payment instruments, or the operational and security risks affecting the central infrastructures. In certain cases, the enhancement of the transparency of payments also arises as one of the objectives of the introduction, which may have positive effect on the efficiency of tax collection or the prevention of money laundering and terrorist financing cases. In addition to payment considerations, the purposes of the introduction of central bank digital currency may also include in certain countries the enhancement of the efficiency of monetary policy or raising economic performance. Several central bank analyses have pointed out, in addition to the above, that the implementation may be encouraged in certain countries by avoiding the potential liquidity outflow from the country in the event when central bank digital currency has already been implemented in other countries.

Based on foreign central banks' assessments and pilot projects, the foundation of the decision on the introduction of central bank digital currency calls for detailed impact analyses affecting all segments of the financial system. Irrespective of the method of implementation, the distribution of duties between central banks and market participants in the area of operation, communication with the customers and the creation and operation of the related payment services must be examined. In this area the longer-term effect of the implementation on banking innovation and on the performance of other banking business lines, in addition to payments, is to be analysed further. In addition, the central banks assessing the possibilities of introducing central bank digital currency also analyse the impacts on the central bank's monetary policy instruments and on the central bank's balance sheet. The impact on financial stability is also a consideration for assessment, primarily in the area of the transformation of banks' business models and banking operation as well as of the ability to manage financial shocks. In addition, among the impacts on the stability of the financial system, IT operational and security issues must be also assessed. Based on the international analyses, the factors influencing demand for central bank digital currency should also be widely examined. These include issues related to the pricing and interest rate of the instrument, and whether it is necessary to cap the convertibility of commercial bank money to central bank digital currency. In terms of availability, in line with the objectives of the introduction, it should be also assessed

⁴⁰ BIS CPMI: Payment Aspects of Financial Inclusion in the Fintech Era - <https://www.bis.org/cpmi/publ/d191.pdf>

how widely the new instrument should be made available to households, enterprises and to non-residents.

Bigtech companies may bring considerable challenges both for central banks and commercial banks. These enterprises have already accumulated substantial customer base, data and capital in various infocommunication areas, and thus any of their payment service developments may have a substantially greater effect than other fintech innovations. The business opportunity for bigtech companies, in addition to the specific fee revenues, may be represented by the fact that they will have even more valuable data – primarily linked to transactions – of customers, thereby learning customer habits even more thoroughly. A mobile payment application has already appeared in Hungary, the creation and operation of which is performed in cooperation of a bigtech company and a commercial bank. At the same time, the bigtech initiatives, such as Facebook's Libra project, aimed at creating global payment systems independent of central bank issuance and commercial banks, may have considerably larger effect on the traditional banking sector and even on the presently known monetary system. Based on the regulatory feedbacks from several countries, the planned system of Libra has been altered⁴¹, but it can be stated that the realisation of such bigtech initiatives may greatly transform the present financial market, as a result of which market competition and thus innovation may decrease in payment services.

4.4 IMPACT OF THE CORONAVIRUS ON DOMESTIC PAYMENTS AND ON THE OPERATION OF FINANCIAL INFRASTRUCTURES

4.4.1 Impacts on payments

The MNB elaborated several proposals, affecting payments, to decelerate the spread of the coronavirus, support the fight-down of the pandemic as soon as possible and mitigate the negative economic impacts. The MNB has taken measures to foster the more intensive use of electronic payment solutions, to reduce physical contacts between people to the minimum: on 20 March 2020, it called upon banks and card companies to raise the limit of HUF 5,000 to HUF 15,000 applicable to the mandatory use of PIN code in the case of contactless payment card purchases. Building on the MNB's initiative, the Government prescribed in a Decree the implementation of the aforementioned amendment on a mandatory basis⁴²,

as a result of which the limit for the mandatory use of the PIN code was raised almost on all POS terminals and cards facilitating contactless payment by 15 April. As a result, almost 90 percent of contactless purchases fell into the range of transactions that can be carried out without the handling of the POS terminal by the customer, i.e. without physical contact. An exception to this is the mandatory use of PIN code after 5 transactions or a forint equivalent of EUR 150, necessary due to the requirements pertaining to strong customer authentication; however, this has worked like this also at contactless purchases below HUF 5,000 before as well. Nevertheless, still significantly fewer physical contacts can be expected, which facilitates safer payment. The progressive nature of the MNB's measure is well reflected by the fact that on 25 March 2020 the European Banking Authority made a similar proposal in its official communication.

As a result of the restrictions introduced due to the coronavirus pandemic, the transformation of the commercial and service sector, the change in consumer habits and the MNB's progressive measures, major redirection is expected in payments toward electronic payment methods, part of which may remain permanent.

As a result of the coronavirus pandemic and the restrictions accompanying the announced state of emergency everyday life has changed radically. Measures have been introduced to minimise physical contact in numerous situations, and consumers' precautionary considerations also greatly contributed to the transformation of the commercial and service sector. In the wake of this, online administration becomes increasingly popular, and a major shift commenced from purchases at physical merchants to online shopping due to the fast development of the various home delivery services. In parallel with this, the simple to use, typically remote electronic payment methods, not requiring physical contact, such as credit transfers and online payment card purchases also gain ground. Part of these effects – permanently becoming integrated in consumer habits – may generate long-term changes, as a result of which the increased share of electronic payments within payment transactions may remain in place even after the easing of the extreme situation caused by the pandemic and life returns back to normal.

4.4.2 Infrastructural impacts

According to the MNB's assessment, the domestic and international financial infrastructures are well-prepared

⁴¹ https://libra.org/en-US/wp-content/uploads/sites/23/2020/04/Libra_WhitePaperV2_April2020.pdf

⁴² Government Decree No 60/2020 (III. 23.) on measures necessary for improving the health security of contactless payments with regard to the state of danger

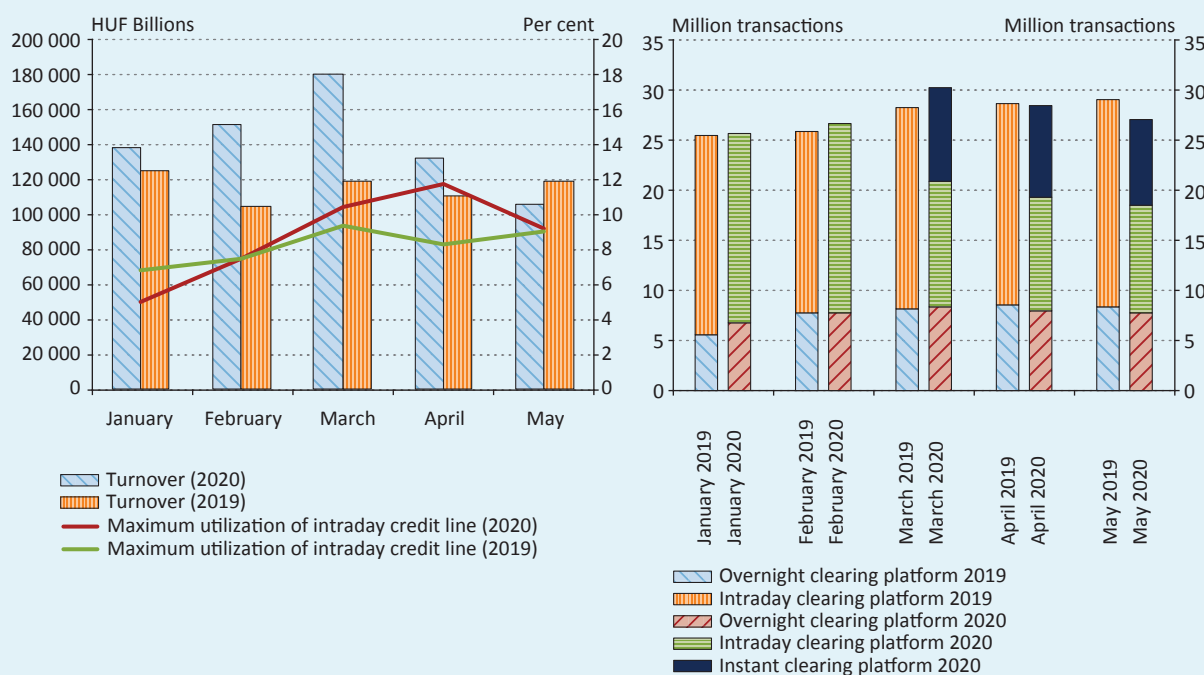
for discharging their duties stemming from their prominent role also in the situation caused by the coronavirus pandemic. The operators of the systems overseen by the MNB give priority to protecting the health of their employees, and thus they transformed their operation in such a way that they can provide the appropriate service level to the participants of the money and capital markets and to customers of their system participants safely during the pandemic as well. Precautionary measures included the creation of the conditions for teleworking, the assessment and provision of the conditions for remote access to the critical IT infrastructure, the sharing of work between the various sites, increasing the hygiene of the workplaces and restricting the entry of external guests. When the curfew measures entered into force, communication between the system participants and system operators was moved to online platforms. The MNB continuously monitors the preparedness of the overseen systems to fend off the pandemic, and – in view of the market turbulence developed as result of the coronavirus – the liquidity situation of the system participants.

The MNB supports the availability of ample liquidity in the payment systems by a variety of measures, and thus the smooth management of the payment turnover is not jeopardised by the pandemic. VIBER turnover grew continuously – by HUF 2,000-3,000 on a daily basis – from January until March 2020, followed by a decline until

the end of May accompanied by major daily volatility. Between January and April turnover transacted in VIBER exceeded year-on-year turnover, but growth halted in May. The number of transactions in ICS slightly increased from February 2020, which in March, simultaneously with the opening of instant clearing to the banks' customers exceeded the year-on-year volume by 7.2 percent. In April, ICS turnover was similar to that of April 2019, while in May turnover fell short of that of last May by 6.2 percent. There is ample liquidity, even after the cancellation of the central bank reserve requirement, available for the settlement of turnover of the Hungarian payment systems, i.e. of VIBER and ICS. The liquidity level of January 2020 (HUF 2,500±200 billion) rose to HUF 3,000 billion when the pandemic appeared in Hungary, and in March and April it was continuously in the band of HUF 3,000-3,500 billion. Growth in liquidity was attributable to the gradual increase of roughly HUF 600 billion in the stock of collateral securing the intraday credit line. The maximum utilisation of the credit line at systemic level is similarly low as before: from the 2-6 percent recorded in January and February it rose only to 8-17 percent by March and April, which indicates that at macro level banks still do not have to resort to using their credit line to a significant degree (Chart 49). In addition, the optionally pledgeable securities portfolio in the balance sheet of the participants of the payment system also provides substantial liquidity reserve. In order to mitigate the turbulence and strengthen interbank liquidity,

Chart 49

Developments in the value of VIBER turnover, the maximum utilisation of the credit line at systemic level (left-hand chart) and in the number of transactions of the ICS turnover (right-hand chart) (2019 -2020)



the MNB has adopted a number of measures, including – among other things – the acceptance from the end of March 2020 of forint and foreign currency-denominated receivables of large corporations, in addition to securities, as a cover for collateralised loans also available for the settlement of payment transactions.

KELER CCP manages the money and capital market turbulence resulting from the coronavirus pandemic with appropriate measures, for which it has sufficient collateral. KELER CCP follows large-scale capital market shifts by dynamic, active risk management in order to maintain its own and the cleared market's safety, for which its risk management framework proved to be adequate. In order to eliminate price shifts, an extraordinary increase of the initial margin was implemented several times to ensure that even in the event of a potential default it can safely settle its obligations to all clearing members. The initial margin calculation methodologies are properly

calibrated and the two-day price changes exceeded the initial margin requirements only twice, while this occurred at other European central counterparties more frequently. No insufficiency occurred in the guarantee fund, which implies the adequacy of KELER CCP's stress tests. In addition, immediate clearing was executed only once to ensure that the positions reflect at all times the prevailing market conditions. The latter also proves the adequacy of initial margins, contrary to other European central counterparties, where additional intraday margin calls had to be made several times. Amidst the volatile market circumstances delayed delivery values at the securities leg increased, which exceeded already now the total value of delayed deliveries recorded last year. Furthermore, on one occasion, on 26 March 2020, a delayed delivery became an actual default, but KELER CCP implemented a successful buy-in, as a result of which it was able to deliver the respective securities to its clearing member properly.

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.

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