PAYMENT SYSTEMS REPORT

2018

'Remember to set an example
in everything you do.'

King Louis I. ('The Great')

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2018

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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 and efficient functioning of the financial market infrastructures that support it. All 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 22 May 2018. Contributors: Patrik Gergely Balla, Dániel Béres, László Bodnár, Judit Brosch, Éva Divéki (editor-in-chief), Krisztina Füstös, Gábor József Harkácsi, Éva Hegyes-Szabó, Tamás Ilyés, László Kajdi, Milán Kiss, Miklós Luspay (Head of Department), Milán Mészárovics, Cecília Pintér (editor), Kristóf Takács, Miklós Tornai and 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 13 March 2018 and 22 May 2018, and at the Monetary Council meeting on 8 May 2018.

The MNB staff relied primarily on information relevant to 2017, although in a forward-looking manner the Report also analyses the ongoing developments observed in the course of 2018.

Contents

Key messages

The turnover of purchases by payment cards and the number of physical points of sale are increasing dynamically, by nearly 25 percent annually, and Hungary is among the leaders in Europe in terms of the prevalence of the contactless technology.

The number of both physical points of sale and POS terminals increased by nearly one quarter during the year. In addition, 2017 was also the year of a breakthrough in the use of the comfortable and fast contactless technology, which became a determinant in domestic card payments; this technology accounted for most of the card purchase turnover. This was facilitated by the expansion in the contactless infrastructure, as a result of which more than 70 percent of payment cards and 80 percent of POS terminals support the use of the new technology. The development in e-commerce is indicated by the significant increase in the turnover of card-not-present online payment transactions, although the ratio of this turnover to all payment card transactions is still relatively low.

The efficiency of the Hungarian payment system is continuously approaching the EU average.

The efficiency of payments improved in 2017 as well, and came even closer to the EU average. Inter alia as a result of the central bank's active role as a developer, now there is only a slight lag in the ratio of credit transfers to GDP compared to the European average. In addition, primarily as a result of an expansion in the domestic payment card infrastructure and the purchase turnover, significant development was seen both in retail electronic payments and in the field of the electronic payment of utility bills and other service charges.

Compared to the turnover, the magnitude of payment card frauds declined further, i.e. safety, which is outstanding in international comparison as well, continued to improve.

Although the number of card frauds slightly increased in 2017, this increase is well below the expansion in the total payment card turnover, i.e. on the whole, the use of cards became even safer. Moreover, as a result of the consumer-friendly regulatory background, less than ten percent of the losses caused by fraud is borne by card holders, while most of it is borne by card issuers and acquirer payment service providers.

At present, neither the level, nor the structure of the prices of payment services stimulate sufficiently the spreading of electronic transactions.

Compared to other countries, the prices of payment services – even with the exclusion of the price increasing effect of the financial transaction levy – are relatively high in Hungary. With special regard to credit transfers, the ratio of fees applied depending on the number of transactions and the value of the payment order is high, which significantly increases the costs of electronic payments for those who use them. At the same time, the ratio of package pricing, which is independent of the number and value of transactions, applied by payment service providers is lower than in other European countries. In 2018, the MNB is preparing a detailed analysis of the pricing of payment services and is initiating a dialogue with payment services market participants in order to identify what steps could be taken in Hungary already in the short term for a pricing that is more favourable for customers and that encourages the usage of electronic transactions.

Financial institutions' revenues from payment services proportionate of turnover show a slightly declining trend.

Based on the data of the first three quarters, financial institutions' revenues from payment services rose by 6 percent compared to the previous year. Comparing revenues as a proportion of transactions to the number of electronic payments, a slightly declining trend is seen, i.e. payment services became specifically cheaper for consumers. The situation is similar in the case of the value of transactions and revenues as a proportion of them. At the same time, a slightly rising trend is seen in the case of revenues per payment card.

The overseen financial market infrastructures worked efficiently and safely in 2017, supporting the functioning of financial and capital markets with their high availability.

The value of payments executed in the overseen systems increased considerably, while the number of transactions rose to a lesser extent. In 2017, VIBER and the ICS realised a more than 10 percent increase in turnover value, while the turnover of KELER and the value of capital market transactions cleared by KELER CCP remained practically unchanged. The operation of the systems was robust during the whole year. Compared to the previous year, the availability of KELER, KELER CCP and the ICS deteriorated slightly, while that of VIBER improved. With increase in the recovery time of incidents, the operational risk was slightly up in the overseen systems in 2017. The CLS and T2S financial market infrastructures, which are under international cooperative oversight with the participation of the MNB, operated safely and efficiently, similarly to the domestic systems.

In 2017, the participants in the payment systems conducted efficient liquidity management, as a result of which there was sufficient liquidity for the execution of payment transactions.

The liquidity of the participants of the payment systems was affected by the quantitative limit on the three-month deposit as well as by the reduction of the required reserve ratio to 1 percent in December 2016. As a result, during 2017, participants' payment account balance with the MNB declined to a HUF 2–300 billion lower level compared to the previous year, which was offset by the participants by increasing their government securities holdings. As a result of participants' efficient liquidity management, the decline in the balance of the payment account did not lead to an increase in the maximum utilisation of intraday credit lines. Actually, they used their respective intraday credit lines for the execution of their payment turnover for a shorter period of time and at a lower value on average. Although the number of queuing in VIBER increased in 2017, the average time spent in the queue declined, and was typically shorter than 1 hour.

There was no default event in 2017, and the late payment events did not generate any loss either to the KELER CCP or to the clearing members.

The risk management framework of KELER CCP successfully managed the increased risks stemming from clearing members' late payment events in 2017. Compared to the previous year, in 2017 KELER CCP recorded two and a half times more late payment events with one and a half times higher total value. Three quarters of them were related to the capital market, while the rest to the cleared energy markets. In all cases in the capital market the late payment events were connected to late delivery of securities, while in the energy market late payment of financial obligation and collateral took place. In 2017, in the energy market one clearing member's liquidity problem caused late payment event lasting for several days, which was adequately handled by KELER CCP. The clearing membership of the clearing member concerned in this latter case was finally terminated, therefore, the clearing member cannot pose any risk to KELER CCP or the markets any longer.

KELER Central Securities Depository submitted its application for CSDR authorisation on time.

The CSDR is a set of rules promoting the safe, efficient and sound settlement of financial instruments in the European Union. Also, CSDR determining uniformized regulatory requirements for CSDs. KELER CSD had to submit its application for authorisation to the MNB within six months following the publication of the regulatory technical standards (RTS), which are containing the detailed rules of authorization an operation of a CSD. KELER as a specialised credit institution needs a licence not only for its central securities depository services but also for its banking type ancillary services. The authorisation procedure is expected to be closed in 2018 H2.

The Supervisory College of KELER CCP chaired by MNB has discussed the 2017 activity of KELER CCP and concluded that the operation of the CCP complies with EMIR requirements.

The annual meeting of KELER CCP Supervisory College was held in November 2017. The College discussed the most important issues of 2017 regarding the provided services as well as the short- and medium-term plans of the central counterparty. The main topics of the meeting included the clearing and guarantee undertaking of the spot transactions of the SME market, the cross-border clearing and guarantee undertaking service planned for the Romanian Commodities Exchange BRM, the change in the clearing currency of the CEEGEX transactions from forint to euro as well as the transfer of the CEEGEX forward gas transactions to the HUDEX gas market. The Supervisory College has found that the operation of KELER CCP is in line with EMIR requirement.

Closer cooperation with international market participants makes the preparations against cyber attacks more efficient.

The MNB continuously follows the international sectoral recommendations concerning cyber security, and includes their relevant parts in its own oversight methodology, decrees and recommendations. In addition, the MNB has participated in the ECB working group dealing with the cyber security of financial infrastructures for years. The working group assessed and evaluated the preparedness of the relevant European financial infrastructures. It also made specific proposals for remedying the deficiencies observed. In the near future, an international working group dealing with cyber security will be set up with the involvement of market participants and regulators and with the objectives of strengthening cooperation as well as simpler and faster sharing of information.

According to the regulatory payment inspections conducted in 2017, payment service providers were most likely to violate rules pertaining to the notification of customers and to the immediate crediting of the amounts of payment transactions.

The general experience of the payment inspections conducted in 2017 is that the operation of the inspected payment service providers is adequate, although all of them violated regulations. The inspections conducted at 15 institutions found violations of regulation in 156 cases. In terms of their business effect, on some occasions they jeopardised the predictability of the performance of payment transactions. With late or faulty fulfilment of payment orders and as a result of providing inadequate information, payment service providers also caused smaller or greater losses to customers (e.g. customers could only later dispose of the amounts due to them, or they did not have information about the possibility of cost-free subsequent information). Based on the regulatory payment inspections conducted in 2017 and together with the inspections carried over from 2016, fines amounting to a total HUF 75 million were imposed.

In the interest of customers, the MNB started the inspection of the compliance with the Decree on payment accounts switching; the inspection revealed inadequate practices of some institutions.

During the regulatory payment inspections in 2017, the MNB found that credit institutions refused the termination of accounts, which is related to and the last step of the process of switching accounts, on several occasions even in cases when it is not allowed by law. The most frequent reason for the refusal was when payment card and/or other service(s) (Internet bank, texting service) also belonged to the customer's payment account. A further deficiency was that most of the inspected institutions did not meet the obligation to provide information for easing the cross-border switching of accounts.

The regulation of instant payments was ready at end-2017, and the new service, which is innovative by international standards as well, is planned to be available in Hungary starting from 1 July 2019.

The setting up of the instant payment system is the common interest of all the parties concerned; the services relying upon the system will allow the electronification of a significant amount of cash transactions. Payments that are becoming instant for a wide range at international level as well in the medium term allow the modernisation of a number of economic processes. In 2017, GIRO Zrt. started to set up the central infrastructure that processes instant payments and other systems that support the additional services, and, in parallel with that, developments also started at payment service providers that were to join. At the end of the year, the MNB adopted and published the statutory provisions concerning instant payments, and the rulebooks describing the details of the functioning of the system also became public. The liquidity management framework that supports the safe and reliable operation of the system is also being finalised.

The MNB and GIRO support the development of modern and customer-friendly services based on instant payment with the introduction of innovative technologies.

Real-time payments implemented with the instant payment system make the operation of the financial sector more efficient and increase the competitiveness of the economy. In order to attain the most favourable effects on the national economy, widely usable payment solutions are needed that allow instant payment in the vast majority of payment situations. The functions of the central system (e.g. mobile phone numbers and email addresses that can be used as account identifiers as well as request to pay messages) support the development of modern payment services. It is the common interest of the MNB and the market that these services should be made cheap for customers and the structure of pricing should stimulate a significant increase in the number of transactions. Return on the necessary investment should be ensured by the new transaction turnover and not by high prices. It is the MNB's definite expectation that already at the start market participants should have instant payment solutions available that are based on open standards, are interoperable, simple to use and safe.

The payment brand covering the basic instant payment service may contribute to the spreading of instant payments and facilitates the appearance of innovative payment solutions relying upon the basic service.

The objective of the payment brand strategy is to make the basic services known widely by customers that use or potentially use the payment service. It is important that the payment brand should intervene in the development of the additional services only to the minimum extent necessary. This ensures wide opportunities for competition and the spreading of innovation in this field, allowing the emergence of a number of new additional service brands. Although not necessarily parts of the payment brand but may be related to it are the descriptions of data entry standards and basic payment processes that ensure the standardisation of payment services; these descriptions are elaborated by the stakeholders in cooperation with one another or individually. Interoperability between payment services can be implemented by making the standards and processes open.

As the medium-term strategic objective of the development of payments, the MNB envisaged the consolidation of the Hungarian clearing systems.

With the introduction of the instant payment system in Hungary an up-to-date and flexible infrastructure will become available for the participants in domestic payment transactions, and theoretically this infrastructure may also be used for the handling of transactions that do not fall under the obligation of instant processing. As economies of scale is of basic importance in payments, medium-term consolidation of some of the currently existing elements of infrastructure (intraday clearing, overnight clearing) is worth considering. However, it is possible to decide on the consolidation of individual system elements only if the functions of the instant payment system as well as the costs and possibilities of diverting certain types of transactions are known. Taking them into account, during 2018 the MNB is preparing a detailed medium-term infrastructure strategy.

The possible advantages and risks of digital central bank money are subject to examination by central banks, including the MNB, all over the world.

As a result of recent years' technological innovation, it has become theoretically possible for central banks to create widely available central bank money in digital form as well. The introduction of digital central bank money would fundamentally change the operation of the financial intermediary sector, affecting central banks' scope of duties in various respects. Central bank areas affected include payments, whose efficiency may increase with the putting of the new central bank money into circulation, because in lieu of the costly manufacturing and handling of cash, the digital format may result in savings at the level of the society. Nevertheless, various challenges and risks also arise, not only in respect of payments, but concerning monetary policy and financial stability as well. In line with, inter alia, the analytical works of the English, Danish and Swedish central banks as well as the European Central Bank, from a professional aspect the MNB considers the well-founded examination of this issue important.

The MNB continuously monitors the role of virtual currencies in the payment system, although no major increase in turnover is expected in this field at present.

Recent years have seen an increase in the number of virtual currencies, which, without a central issuing and operating institution, using the blockchain technology, offer services that are independent of the present financial sector. At the same time the role of these types of currencies is very limited in payments, mainly as a result of the fact that due to their decentralised nature and the ensuing characteristics (e.g. significant exchange rate volatility or inflexible money supply) they are unable to adequately fulfil money functions. Nevertheless, in cooperation with other state institutions and following the international trends, the MNB continuously examines whether it is necessary to regulate the functioning of virtual currencies, and if yes, how.

With the transposition of the new Payment Services Directive, the operation of non-bank innovative players may enhance competition and increase the quality and safety of services provided to customers in Hungary as well.

With the observance of strict security rules, the new Payment Services Directive, which entered into force in January 2018, allows customers to employ innovative third-party service providers for carrying out their payment transactions. These measures are determined by the regulatory technical standards on secure communication and strong customer authentication. Certain supplementary rules facilitating the application of the provisions of the directive have not entered into force yet; therefore, in the transitional period until they enter into force, payment service providers do not have to comply with some provisions of the directive or have to comply with them differently. The MNB's inspection practice also needs to be changed due to the new technical and security requirements.

1 Introduction

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 the reliable and efficient functioning of the payment and settlement systems. The broader use of cost effective, fast and secure electronic payment methods by economic agents would save significant resources in payment transactions at the level of the society, which would have a beneficial effect on the competitiveness and the growth rate of the economy. In order for this to occur, however, it must be possible to simply and safely use electronic payment instruments alongside cash in most payment situations, at low and transparent costs. Moreover, it is also essential to ensure that Hungarian financial market infrastructures support the execution of the real economy and financial transactions initiated by economic agents by providing high quality services in accordance with regulations. Consequently, oversight of the financial market infrastructures is a key responsibility of the central bank. Since 2017 the oversight of financial market infrastructures has integrated the supervision of the securities settlement system as well as of the central securities depository and central counterparty activities. The reliability, security, efficiency and liquidity management of the systems and the relevant interdependent services are monitored and analysed in a risk-based oversight framework. The examination of the compliance with the legally binding international regulation concerning central counterparties as well as securities settlement systems and central securities depositories has become a part of this framework. During the payment inspections of credit institutions and other payment service providers, by exploring deficiencies, the MNB contributes to the strengthening of their legal compliance. Thus it facilitates the reliable and compliant operation of the financial intermediary system, the ensuring of the predictability of payment processes for customers and through that the efficient delivery of services to consumers.

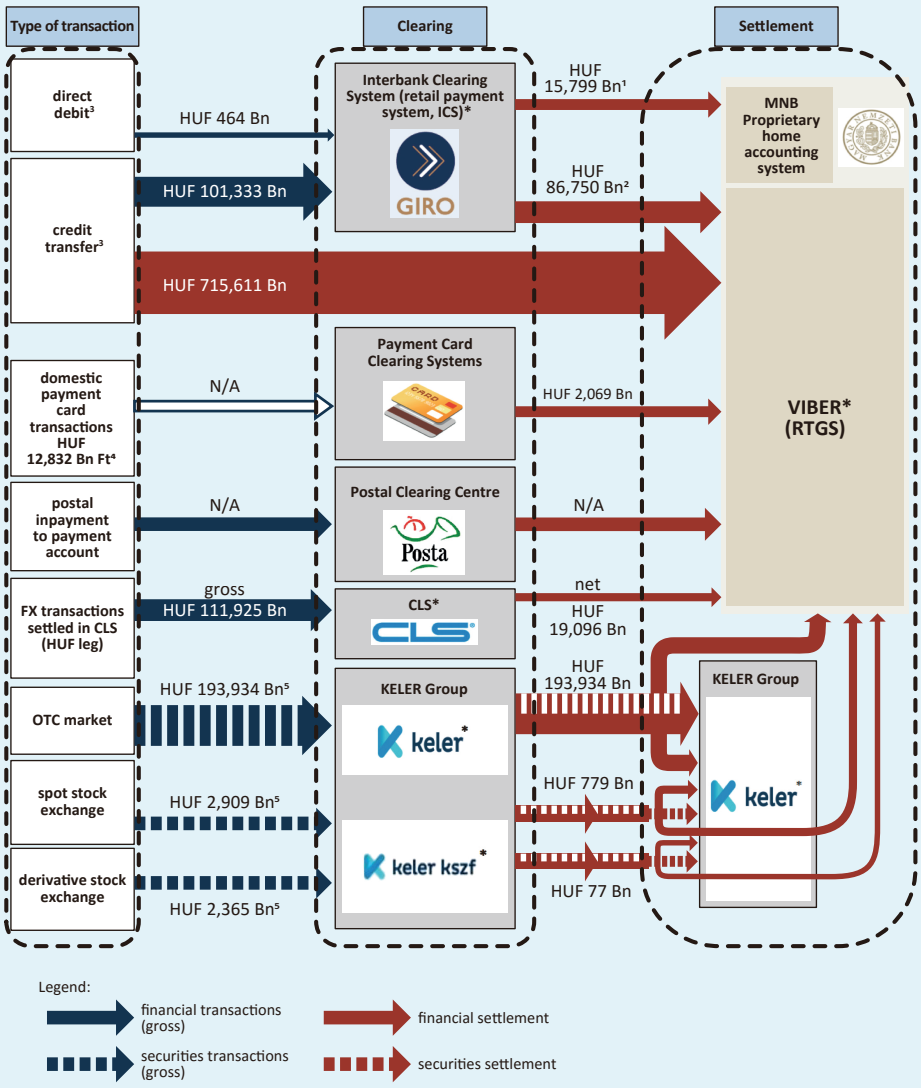
The MNB fundamentally acts as a catalyst in improving efficiency: it prepares analyses, and uses the tools of active coordination and dialogue to create conditions where stakeholders take into consideration the interests of the society in making their decisions. The more extensive usage of electronic payment instruments may have a number of positive effects on the Hungarian economy. It can help to improve the efficiency of payments, reduce the resource requirement of transactions and suppress the shadow economy, all of which in turn promotes economic growth. In addition to its role as a catalyst, the MNB also regulates the execution of payments and can thus influence the market of payment services via requirements laid down in decrees issued by the Governor of the MNB.

Analysing the efficiency of payments, the first part of this Report presents the use of payment methods in Hungary and the relevant development trends, the changes in fraud events related to electronic payments as well as in the revenues from payment services and in the pricing of retail payment services. Following that, developments related to the functioning of the Hungarian financial market infrastructures and their oversight are presented. The findings of payment inspections are also described in this part of the Report. The second part of the Report discusses three key issues in detail: the introduction of the instant payment system, the medium-term strategic directions of payments and important, practical questions arising in connection with the new Payment Services Directive.

2 Operation of the domestic payment system

The smooth execution of payments and the reliable, efficient operation of financial market infrastructures are essential for the execution of real economy and financial transactions. Payments in central bank or commercial bank money in account and transactions performed with securities and other financial instruments require centralised systems that provide for the clearing and settlement of transactions. The Hungarian Real-Time

Chart 1
Overview of the Hungarian financial infrastructure
(2017)



[1] *Transactions settled in the overnight clearing*
[2] *Transactions settled in the intraday clearing*
[3] *On-us transactions are not included*
[4] *Only the interbank part of total payment card transactions is cleared in the payment card clearing systems.*
[5] *Securities transactions (gross)*
* *Overseen systems*

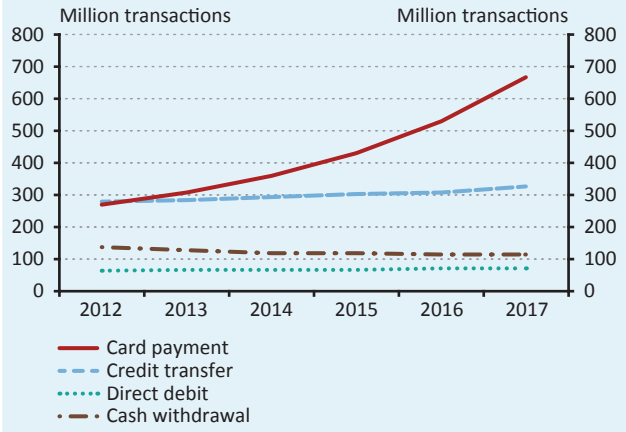
Gross Settlement System (commonly referred to as VIBER) is operated by the MNB. Its primary purpose is the settlement of large-value, time-critical money and capital market transactions between participants and on behalf of their customers and of the related financial market infrastructures (ICS, KELER 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 two clearing methods: intraday and overnight clearing. GIRO performs the clearing of payment transactions, while the MNB, as settlement agent, is responsible for settlement. 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. Members of the KELER Group, the central securities depository (KELER CSD) and the central counterparty (KELER CCP), are responsible for securities clearing and settlement services, and the registration of domestically issued securities. The MNB's oversight activity in Hungary covers the operations of VIBER, the ICS, KELER CSD and KELER CCP. In addition, the MNB takes part in the international cooperative oversight of CLS and T2S. (Chart 1)

2.1 Payment service developments

2.1.1 ELECTRONIC PAYMENT TURNOVER AND THE RELEVANT INFRASTRUCTURE

The dynamic expansion in electronic payment turnover observed in the previous years continued in 2017, which is primarily attributable to the increasing popularity of payment by payment card (Chart 2). Compared to the previous year, in 2017 the turnover related to purchasing by card was up by more than 25 percent, i.e. the significant growth in turnover attained in the previous years increased further. In line with past years' trend, the number of direct debit transactions grew by 3 percent, whereas the expansion in credit transfers exceeded 5 percent, which can be considered outstanding compared to the previous years. The number of cash withdrawals rose slightly, by 1 percent, to nearly 116 million.

Chart 2
Turnover of main payment transaction types related to payment accounts
(2012–2017)



Domestic payment habits can be directly examined practically in the whole retail sector through the turnover of the online cash registers connected to the National Tax and Customs Administration. From the 2015–2016 anonymised database the MNB prepared an analysis regarding the typical use of electronic payments in the retail sector.[1]

Online cash registers in Hungary perform an average 3.7 billion transactions a year with a value of nearly HUF 10 thousand billion. Cash transactions account for a considerable part of the turnover in terms of both value and volume. The 704 million card transactions shown in the database fall short of the 888 million transactions reported in the statistical data reporting of the Magyar Nemzeti Bank. The underlying reason is that online cash registers are not mandatory in all retail outlets; e.g. a considerable part of the services sector is not included in the database. On the whole, the rest of the turnover is insignificant. The weight of electronic transactions grew in the period under review as well, which also meant that the average value of cash payments increased from HUF 2000 to HUF 2100, while that of card transactions declined from HUF 6300 to HUF 6000. (Table 1)

Table 1
Aggregate features of the online cash register (OCR) database

	2015	2016
Total number of payment transactions	3.63 billion pieces	3.74 billion pieces
Number of cash payments	90.0%	87.7%
Number of payment card purchases	8.7%	10.4%
Number of other payments	2.5%	3.1%
Total value of payment transactions	9,134 HUF billion	9,780 HUF billion
Value of cash payments	74.3%	71.5%
Value of payment card purchases	21.7%	23.7%
Value of other payments	4.0%	4.8%

[1] Ilyés, Tamás – Varga, Lóránt (2018): Acceptance of Payment Cards by Retailers in Hungary Based on Data of Online Cash Registers Financial and Economic Review, Volume 17, Issue 1, March 2018 http://english.hitelintezetiszemle.hu/letoltes/fer-17-1-st4-ilyes-varga.pdf

Box 1

Main features of the online cash register (OCR) database

The OCR database, which covers the data for 2015 and 2016, contains 7.4 billion individual transactions in total. The around 120 thousand commercial outlets included in the sample cover a considerable part of the retail turnover. The 2015 and 2016 data mostly relate to retails outlets, and to a lesser extent to catering and accommodation. The total value of the turnover is roughly half of the 'household consumption expenditure' line in the national accounts, although its magnitude is comparable to the value of retail turnover. The remaining parts of the expenditure side are mainly related to the services sector and housing costs.

During the year, the development of the payment infrastructure was mainly reflected in the considerable expansion in the payment card acquiring network. In 2017, the number of payment accounts held with payment service providers was stable around 10.5 million, and within that, compared to the previous year, there was only a slight increase of less than one percent in the 6.6 million accounts primarily used for payment purposes. The number of payment cards issued in Hungary increased by nearly 2 percent, exceeding 9.1 million at the end of the year. The payment card acquirer infrastructure expanded significantly during the year, which was mainly reflected in the 25 percent increase in the number of physical points of sale. As a result, card payment was already possible at 106 thousand places at end-2017. The number of POS terminals operating at points of sale also grew considerably, by nearly one quarter, and exceeded 136 thousand. The dynamic expansion in the acquiring network is greatly attributable to the POS terminal installation programme announced by the Ministry for National Economy. The program aims at installing, in two steps, 60 thousand new terminals in total, with moderate costs for merchants as a result of the support from the state. Following a steady annual expansion of 11 percent, the number of online points of sale reached nearly 9400 by end-2017.

By now it has become possible to pay by card in the retail outlets that cover most of the retail turnover. It was possible to pay by card only in less than one third of the Hungarian retail outlets included in the 2015–2016 OCR database (in 53 thousand shops out of 174 thousand), but these shops accounted for more than two thirds of the total turnover. As the sales turnover of shops that accept payment cards is typically higher, these points of sale accounted for a total 75 percent of transactions (Chart 3).

Card acquiring in the case of small retail outlets is still well below that of bigger ones. OCR data clearly reveal that card acquiring mostly depends on the annual sales of the given shop. Looking at the distribution of shops by size it can be established that the domestic retail sector consists of many small shops and fewer significantly larger ones. The annual sales turnover of nearly half of the retail outlets is less than HUF 10 million, and only a small proportion of them acquire payment cards. The other half of the shops have an annual sales turnover between HUF 10 million and 100 million;

Chart 3
Statistics of retail outlets acquiring payment cards
(based on the 2016 OCR database)

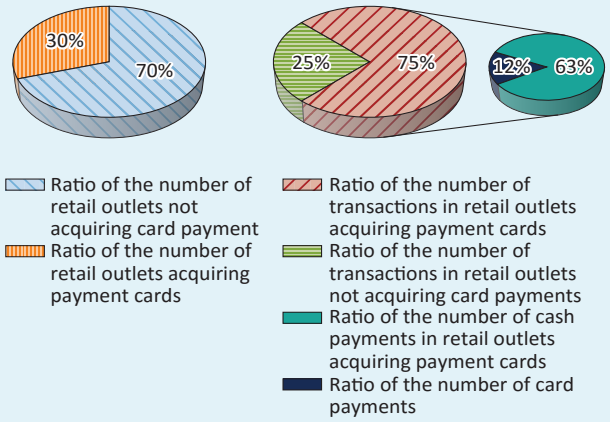
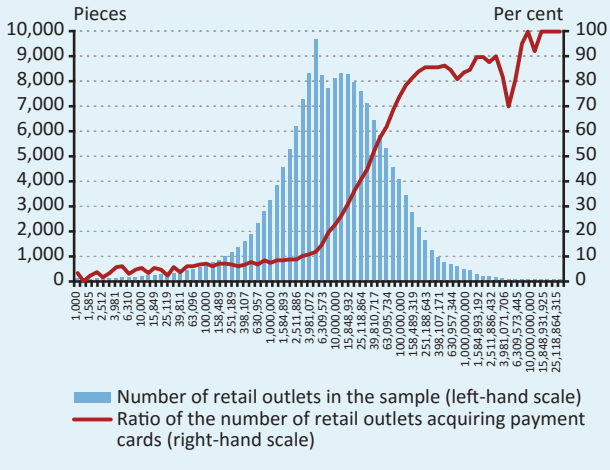


Chart 4
Frequency of retail outlets and the proportion of those that acquire cards by annual sales turnover
(HUF) 2015–2016



in their case, card acquiring is strongly influenced by their size. Almost all shops with an annual sales turnover exceeding several hundred million forints acquire cards, although the number of such shops is low (Chart 4).

In 2017, the expansion in card purchase turnover was greater than ever before. Both the number and value of payment transactions carried out in Hungary and abroad with the use of cards issued in Hungary increased by some 26 percent, exceeding even the also dynamic growth rates observed in the previous years. In line with the previous years' trends, purchase turnover that does not require the physical presence of the card, i.e. primarily Internet purchases was one of the fastest developing segments in 2017 as well, with a growth rate of around 35 percent in terms of both the number and total value of transactions. Nevertheless, payment transactions related to e-commerce still account for a relatively small proportion of the total card payment turnover. The around 77 million transactions with their total value of HUF 828 billion carried out by domestic cardholders at Hungarian and foreign online points of sale account for only a small portion of the total purchase turnover (11 percent and nearly 17 percent in terms of the number and value of transactions, respectively).

The number of payment card cash withdrawals did not change significantly, while the value of cash withdrawn increased slightly during the year (Chart 5). In 2017, the number of cash withdrawals by card exceeded 108 million, representing a slight increase of less than 2 percent. By contrast, the total value of the money withdrawn was up to a greater degree, by some 8 percent, and thus the customers of payment service providers withdrew more than HUF 7400 billion this way, corresponding to a average value HUF 68 thousand per transaction. In the case of retail customers, who initiate 98 percent of cash withdrawals, ATM transactions with smaller average value (HUF 64 thousand) are typical, while the use of POS terminals at bank branches is more typical of corporate clients, which carry out fewer transactions with a higher average value (HUF 254 thousand).

In 2017, the use of the contactless technology has become prevailing in the case of purchasing by card, which is mainly attributable to the rapid expansion in the underlying infrastructure (Chart 6). The number of contactless purchases in Hungary using cards issued in Hungary increased by 65 percent, while their value nearly doubled in 2017 compared to the previous year. As a result, more than two thirds (412 million) of all purchases took place this way, amounting to half (HUF 2326 billion) of the total turnover in terms of value. By contrast, the number of traditional physical purchase transactions declined by more than one quarter compared to 2016. The expansion in contactless turnover is greatly attributable to the dynamic expansion in infrastructure observed in the past years. Compared to the previous year, the number of payment cards with contactless function grew by nearly 18 percent in 2017, and thus already 72 percent of cards have this function. In terms of the acceptance network, the increase in the number of POS terminals that support the contactless technology was also significant, nearly 36 percent. As a result, already 83 percent of the terminals allowed this payment solution.

Chart 5
Annual growth rate of transactions performed in Hungary and abroad with payment cards issued in Hungary (year-on-year)
(2011–2017)

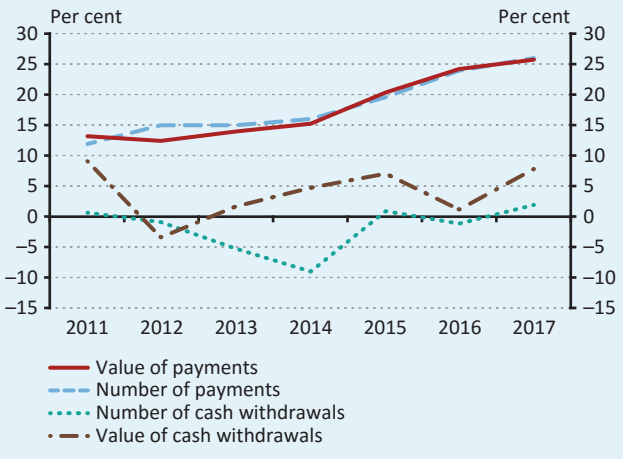
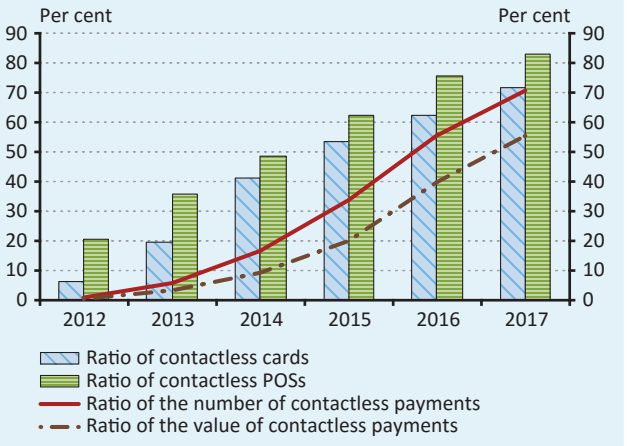
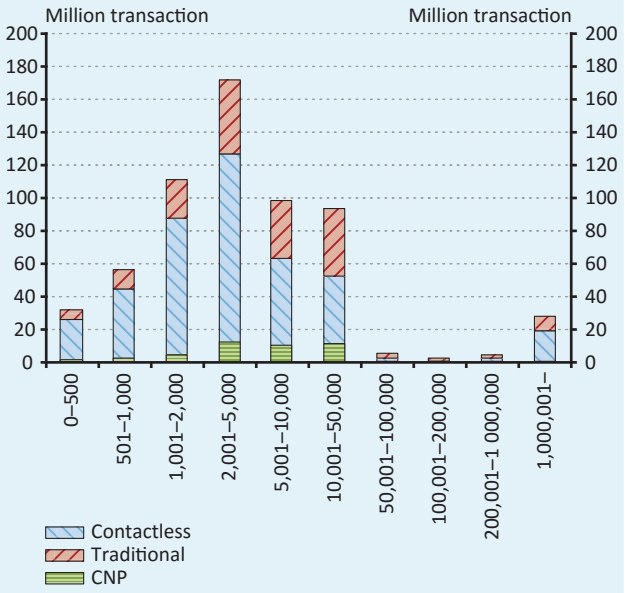


Chart 6
Spread of contactless card technology in the Hungarian payment card system
(2012–2017)



The value of purchases by card is below HUF 50 thousand in the vast majority of transactions, and in low-value payments the use of contactless technology is most typical (Chart 7). Looking at the distribution of card purchases by value limit, payments below HUF 5 thousand account for 60 percent of the turnover. Among these low-value purchases below HUF 5 thousand at physical points of sale the share of contactless transactions is more than 75 percent, and even in the case of payments between HUF 10 thousand and 50 thousand this method accounts for 56 percent of physical transactions. In addition, data also reveal that the use of cards drastically declines in the value range above HUF 50 thousand.

Chart 7
Distribution of turnover of purchases by payment cards by value
(2017)



2.1.2 EFFICIENCY OF DOMESTIC PAYMENTS IN INTERNATIONAL COMPARISON

The dynamic development of domestic electronic payments observed in the past years was also reflected in a rise in the indicators measuring the efficiency of payment transactions as well as in the catching up with the European average (Table 2). The MNB measures the level of development of the Hungarian payment system using three indicators, which cover the most important areas of payments. As their steady growth continued in 2017 as well, the efficiency of domestic payment transactions is also coming closer to the average of the European Union.

In terms of the credit transfers to GDP ratio, the Hungarian payment system already belongs to the most developed one third of Europe (Chart 8). The smallest growth was observed in the credit transfers to GDP ratio, which exceeded the 2016 value in 2017. At the same time, in this area the lag behind the average 17.7-fold ratio of the EU is already insignificant anyway. Compared to other European countries, in this field the level of development of the Hungarian payment system exceeds that of the majority of EU Member States.

Table 2
Changes in indicators measuring the level of development of Hungarian payment systems compared to the EU
(2012-2017)

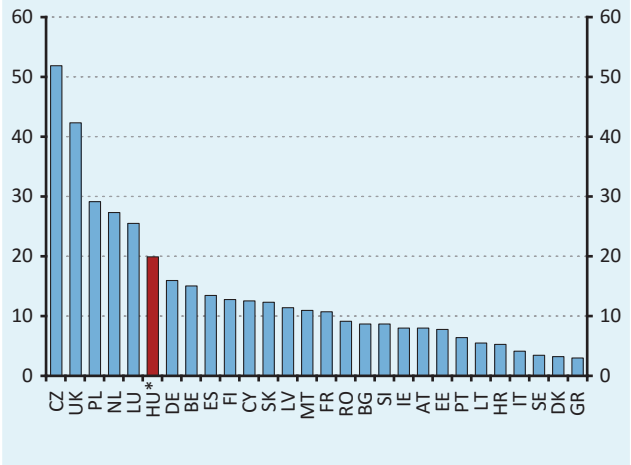
Indicator	Calculation method	Hungary						European Union
		2012	2013	2014	2015	2016	2017	2016
Credit transfers	Annual value of credit transfers / GDP	13.6	13.6	14.2 [1]	14.5 [1]	16.0 [1]	16.2	17.7
Electronic payment of retail purchases	Annual value of payments made by payment cards and other electronic solutions / Annual household consumption	11.8%	13.0%	14.8%	17.4%	20.7%	24.3%	35.9%
Electronic payment of utility bills and other service charges	Estimated annual value of direct debits and other electronic bill payments / Estimated annual value of bill payments	23.5%	24.3%	25.4%	33.5% [1]	39.2% [1]	43.9%	70% [2]

Sources: MNB, ECB, Eurostat.

[1] Deviation from previously published data due to data supplier modifications.

[2] Estimated value based on per capita direct debit figures of EU countries and central bank analyses.

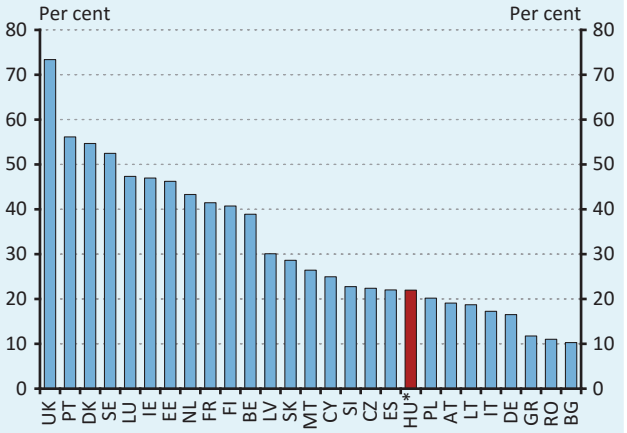
Chart 8
Credit transfers to GDP ratio in European countries
(2016)



** The ECB's data comprise the cross-border credit transfer turnover as well. This is why the value for Hungary is higher than the one in Table 1.*

Source: MNB compilation based on ECB data.[2]

Chart 9
Electronic payment of purchases in European countries
(2016)



** Due to methodological differences and the exchange rate change, it is slightly different from the values for Hungary shown in the table.*

Source: MNB compilation based on ECB and Eurostat data.[3]

Electronic payment is becoming increasingly frequent in the case of retail purchases, which is primarily attributable to the accelerated spreading of payments by card, although there is still ample room for expansion (Chart 9). The value of the indicator concerning the electronic payment of purchases rose to a greater degree than last year, by 3.6 percentage points, which is mostly the result of the increasing popularity of purchases by payment card. The 25 percent expansion in card purchase turnover is greatly attributable to the wide-spread use of the contactless technology, which is a rapid and comfortable alternative even in the case of low-value payments, where almost exclusively cash was used before. The expansion in the card purchase turnover, which is remarkable even in international comparison, at the same time means that in the past years the level of development in Hungary had been rapidly approaching the European level, and in 2017 the value for Hungary already reached two thirds of the European average. At the same time, the comparison of the indicator for Hungary with those of other European countries shows that there is still ample room for expansion in this field, which means further business opportunities for domestic payment service providers as well.

The conclusions that can be drawn from the OCR database allow a better understanding of the factors that affect the use of cards.

Initially, the willingness to use cards increases depending on the value of payment, but it declines gradually above a certain point. Based on the 2015–2016 OCR data, similarly to the size of shops, the value of transactions is also characterised by a high number of low-value and a low number of high-value transactions. The value of half of the transactions is below HUF 1000 and of nearly 70 percent of the transactions is below HUF 3000. As the ratio of card usage is significantly lower in the case of low-value transactions, and these types of transactions dominate the turnover, the average card usage ratio also remains low. The ratio of card usage grows steadily up to HUF 30 thousand, above which it starts to decline, and is extremely low in the case of payments amounting to HUF 1 million or more. The exact underlying reason for this phenomenon is unknown, but we suppose that the significant cash savings held at households and appearing as cash transactions in retail trade may provide an explanation to it (Chart 10).

Willingness to pay by card is significantly affected by the cumbersome nature of cash payment. The card acceptance ratios according to value categories conceal significant internal heterogeneity. For example, on average, 35 percent of transactions around HUF 10 thousand are paid by card, although it significantly depends on the exact value. Increase in the number of banknotes and coins needed for the payment significantly increases the probability of card payment. This indicates that in addition to the value of payment, convenience-related aspects also strongly affect payments by card. Irrespective of the impact of other variables, the probability of payment by card is

[2] http://sdw.ecb.europa.eu/reports.do?node=1000004051
[3] http://sdw.ecb.europa.eu/reports.do?node=1000004051

Chart 10
The frequency of the value of purchases and the ratio of card usage by value on a logarithmic scale
(2015-2016)

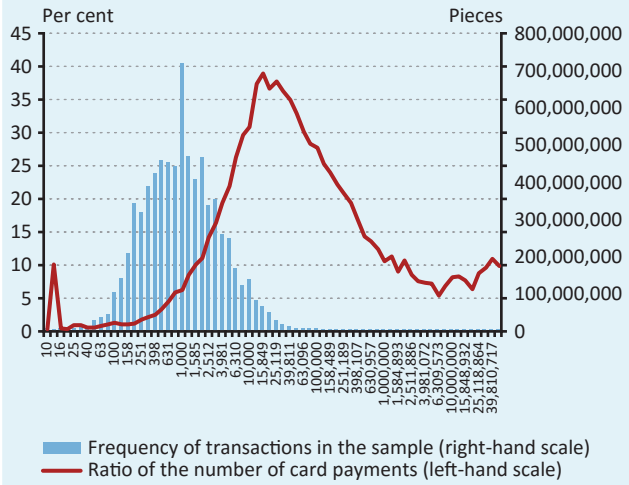
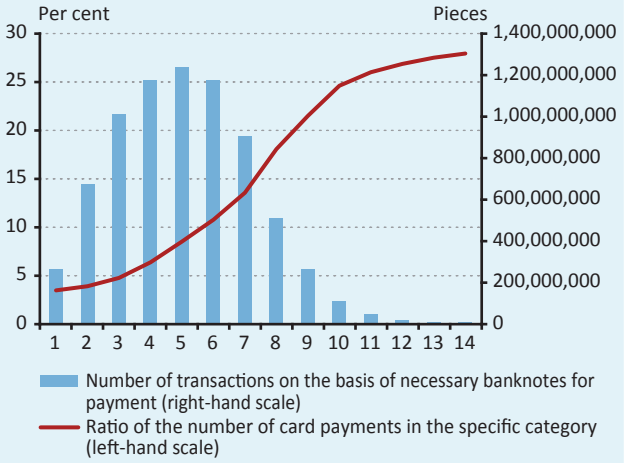


Chart 11
Ratio and frequency of card usge according to the number of the necessary banknotes and coins
(2015-2016)

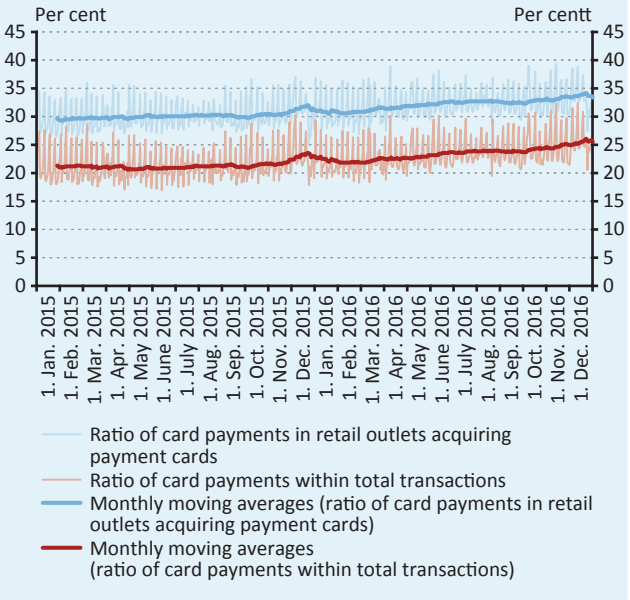


six times greater in the case of a payment that requires 10 denominations than in the case of purchases that can be paid with one denomination directly (Chart 11).

Willingness to use cards increased steadily in Hungary in 2015 and 2016; based on the current trends, the European average can be reached in a decade. According to OCR data, card usage increased continuously during the two years under review. Within all payment transactions, the ratio of card transactions rose from 20 percent to 25 percent but looking only at the turnover of points of sale, i.e. payment situations where it is possible to choose from the two payment methods, the actual ratio was between 30 and 35 percent (Chart 12).

In bill payments, the developments implemented recently had a favourable impact on the turnover of electronic payment solutions, and in 2017 already 44 percent of the bills were paid without using cash. Of the developments of recent years, the changes implemented by the Hungarian Post and the introduction of mobile payment solutions, which have made electronic modes of payment available in the case of an increasing number of bills, deserve mentioning. The electronification of yellow and white cash inpayment money orders, which can be considered a Hungarian peculiarity, fundamentally influences the catching up with the European average, and thus the developments increased the ratio of electronically paid bills significantly. The annual 3 percent increase reached in 2016 in the case of direct debits, which are also primarily used for regular bill payments, remained typical in 2017 as well, thus also contributing to the dynamic growth in the value of the indicator. All these effects jointly resulted in an around 5 percentage point rise in the ratio of electronic bill payments compared to 2016.

Chart 12
Ratio of card usage in all payment situations and at points of sale by value
(2015-2016)

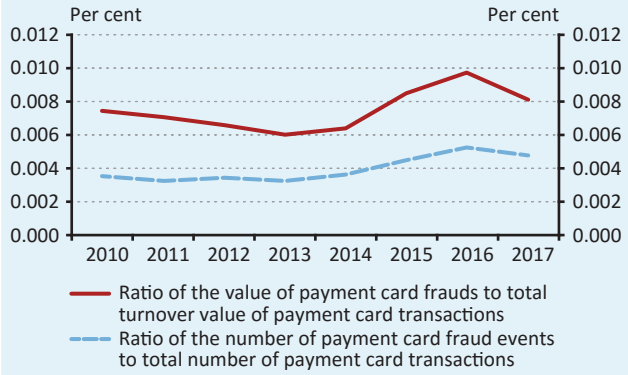


2.1.3 FRAUD RELATED TO ELECTRONIC PAYMENT TRANSACTIONS

In 2017, the ratio of payment card frauds to turnover declined, i.e. payments by card became safer (Chart 13). In the first three quarters of the year, on the issuer side, some 27 thousand fraud events caused losses amounting to HUF 776 million. Comparing the frauds to the total payment card turnover, in 2017 fewer frauds fell to card transactions, whose number and value were growing rapidly, i.e. card use became even less risky in the Hungarian system, which

is particularly safe at international level as well. In the first three quarters of 2017, the ratio to turnover did not even reach 0.005 percent, i.e. there were less than 5 fraud events per 100 thousand card transactions. Looking at the acquirer side, the number of frauds (less than 4200) and the losses caused by them (HUF 202 million) were even lower in the first three quarters of 2017. It is also important that there were only 18 frauds related to the contactless function of payment cards, which is negligible compared to the more than 424 million contactless purchases, i.e. the contactless technology is extremely safe.

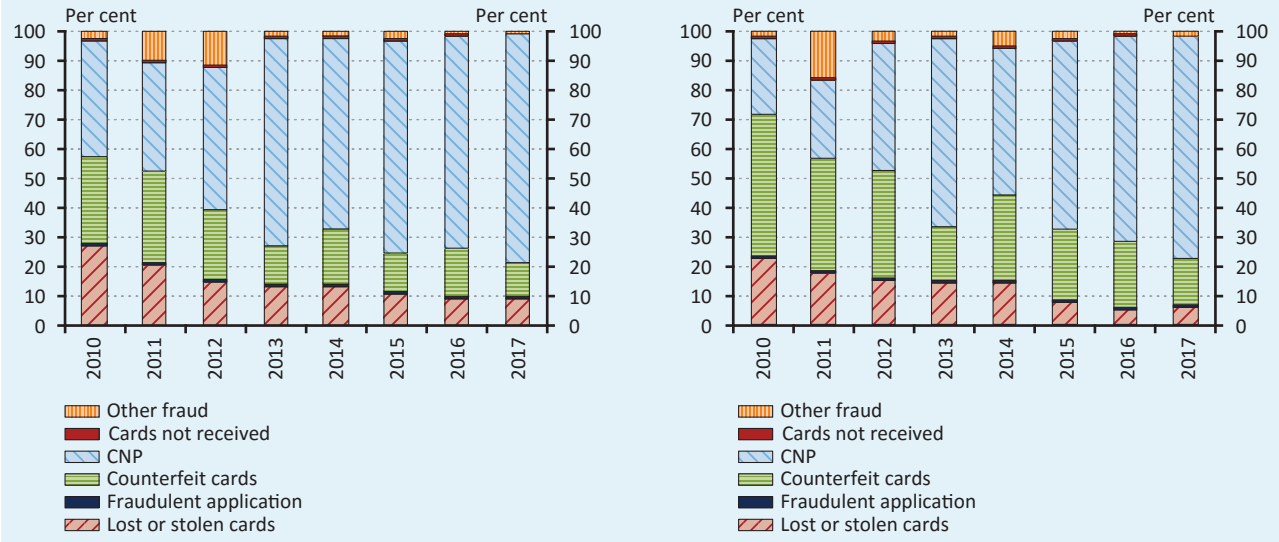
Chart 13
Ratio of fraud and related losses to total payment card turnover on the issuer side
(2010–2017 Q1–Q3)



In terms of the types of payment card fraud, the ones related to card-not-present transactions prevailed in 2017 as well (Chart 14). Similarly to previous years, frauds related to card-not-present,[4] primarily online purchase, transactions dominated in 2017 as well; 78 percent of issuer side events and three quarters of the loss caused are related to the e-commerce turnover. In terms of the direction of transactions, most of the frauds still occurred in the cross-border turnover; 79 percent of all cases and 88 percent of the loss caused were in this category on the issuer side.

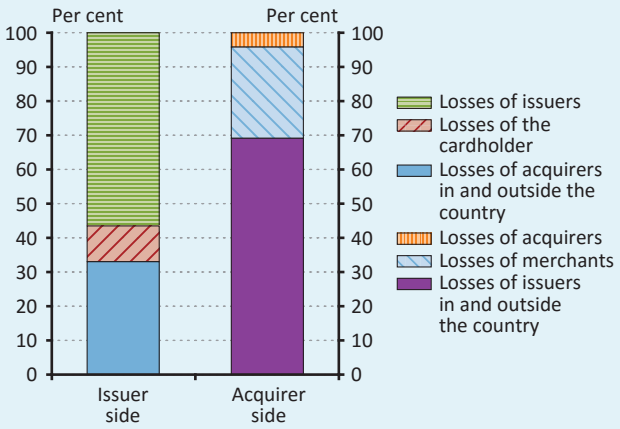
As a result of the legal background, which focuses on consumers' interests, a mere 10 percent of the losses that arose on the issuer side was charged to cardholders (Chart 15). In the first three quarters of 2017, 10 percent of the issuer side losses, amounting to a mere HUF 72 million, were borne by cardholders. Most of the losses (56 percent) were borne by card issuing payment service providers, while one third, i.e. HUF 232 million, of the losses was charged to foreign or domestic acquirers. The losses written off in connection with frauds on the acquirer side also primarily burdened card issuing payment service providers; nearly 70 percent of the loss of HUF 172 million affected these institutions, while one quarter of the losses was borne by domestic merchants.

Chart 14
Distribution of the number and value of fraud events related to payment cards issued in Hungary by fraud category
(2010–2017 Q1–Q3)



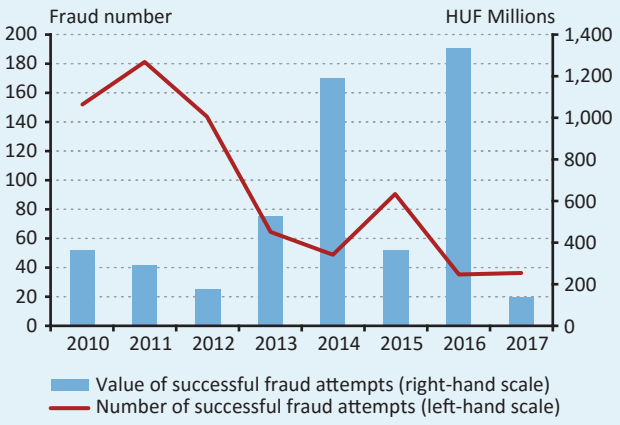
[4] CNP

Chart 15
Losses written off in relation to payment card fraud on the issuer and acquirer sides
(2017 Q1–Q3)



The ratio of frauds committed in other electronic payments to total turnover was negligible in terms of both the number of frauds and the value of the loss caused (Chart 16). Compared to the previous year, the number of frauds in other, i.e. non-card electronic payments (credit transfer, direct debit etc.) remained unchanged in 2017, while the value of the loss caused fell to one tenth. Accordingly, either comparing the 36 fraud events to the nearly 398 million credit transfer and direct debit transactions or comparing the related loss of HUF 136 million to the total turnover of HUF 757 thousand billion, the magnitude of frauds is insignificant.

Chart 16
Number and value of fraud events in electronic payment transactions
(2010–2017)



Note: The chart excludes data on payment card fraud.

2.1.4 PAYMENT TRANSACTION REVENUES

Financial institutions' specific revenues from payment services show a slightly declining trend. Compared to the previous year, the revenues of financial institutions from payment services increased by 6 percent in 2017, reaching nearly HUF 503 billion. Comparing revenues as a proportion of the number of transactions to the number of electronic payments, a slightly declining trend is seen, i.e. payment services became specifically cheaper for consumers. The situation is similar in the case of the value of transactions and revenues as a proportion of them. At the same time, a slightly rising trend is seen in the case of revenues per payment card (Chart 17).

In the field of payment services, fees from credit transfers and account mantainance fees continue to be the most important sources of revenue (Chart 18). In 2017, of the total payment transaction revenues of HUF 503 billion, financial institutions collected one quarter (HUF 124 billion) in connection with credit transfers, which is mainly attributable to the fact that of the electronic payment methods, the total value of credit transfers is the highest, and pricing is also typically proportional to value in the case of this mode of payment. Other important sources of revenue in the area of payment services are the fees related to account packages and account mantainance, amounting to HUF 96 billion during the year.

Chart 17
Ratio of payment transaction revenues as a proportion of the number and value of transactions compared to turnover and the revenue related to card issuance per payment card
(2014 Q3 – 2017)

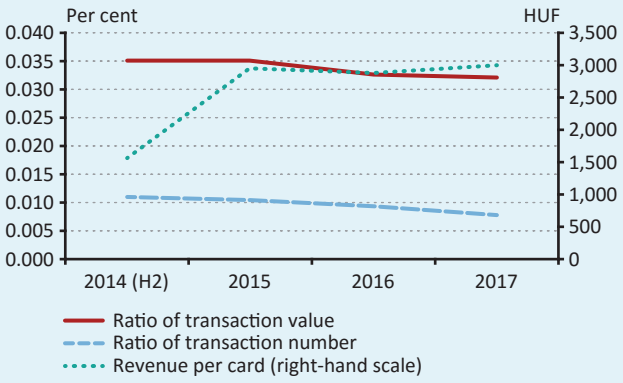
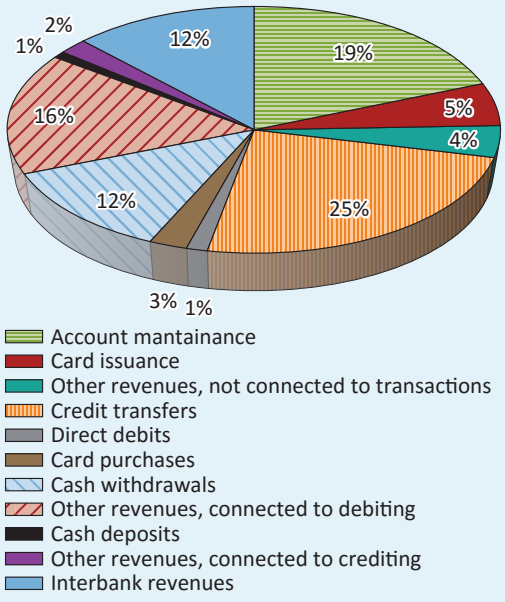


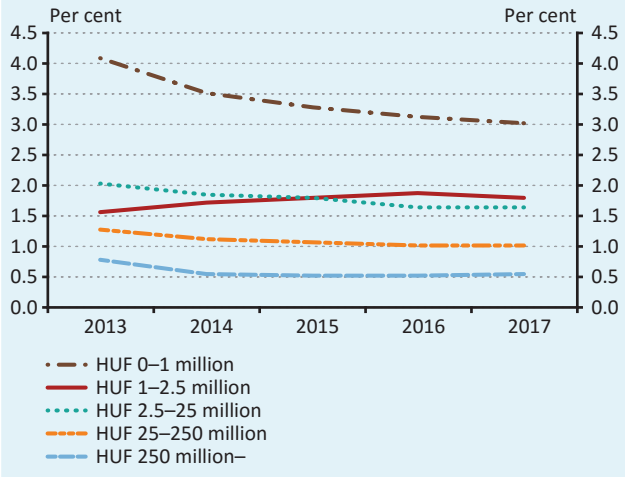
Chart 18
Breakdown of revenues related to payment services by revenue type
(2017)



2.1.4.1 The costs of payment card acquiring

In terms of card acquiring costs, the burdens on smaller merchants are still much heavier, which may affect the expansion of the acquirer infrastructure as well. The MNB collects comprehensive data on payment service providers' card acquiring related revenues, which are costs for merchants on the other side. These data suggest that the earlier trend has not changed, i.e. compared to the card purchase turnover, the acquiring service is still much more expensive for merchants with lower, less than HUF 1 million quarterly turnover. While in the case of these smallest merchants the revenues of payment service providers are estimated to amount to 3 percent of the turnover, in the case of the largest merchants they are around 0.5 percent only. At the same time it was a favourable change that the costs of the smallest merchants declined steadily in the past years (Chart 19).

Chart 19
Ratio of revenues compared to the card payment turnover in merchant categories according to quarterly card turnover
(2010–2017)



2.1.5 PRICING OF RETAIL PAYMENT SERVICES

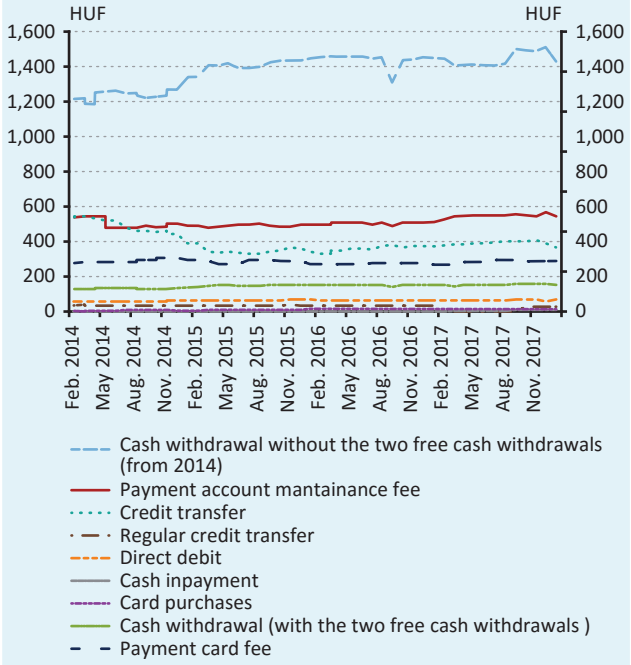
In order to encourage the usage of electronic payment solutions and thus to increase the efficiency of payment system, the MNB still considers it important to continuously monitor the payment service fees charged to retail customers. The fee for payment services has a significant impact on the spread of electronic payment solutions and new, innovative services. The pricing of payment services offered to retail customers may change as a result of a number of factors, including, inter alia, regulatory changes and developments. Regulatory changes that need to be highlighted are the Payment Services Directive, which has already been transposed into Hungarian law, and the impacts of the partly implemented Payment Accounts Directive. Of the developments, the introduction of instant payment is of primary importance. All the above have a stimulating effect on competition, and thus may have an impact on the decline in fees as well. Therefore, the MNB still considers it important to monitor the changes in the pricing of retail payment services.

On the whole, retail customers' payment costs remained unchanged in 2017. Since the introduction of the two free cash withdrawals a month in 2014, payment transaction costs have been stagnant in Hungary. Similar developments are also observed in the changes in monthly payment costs by service type (Chart 20). In the case of certain services, price increases slightly exceeding inflation are seen in monthly account maintenance fees and annual card fees, but, on the whole, still no negative price change trend that affects monthly costs is observed (Chart 21).

The prices of payment services are high in international comparison, and show various anomalies in their structures. The MNB has examined the pricing practices of the banking sectors of several European countries in terms of retail payment services.[5] In the majority of European

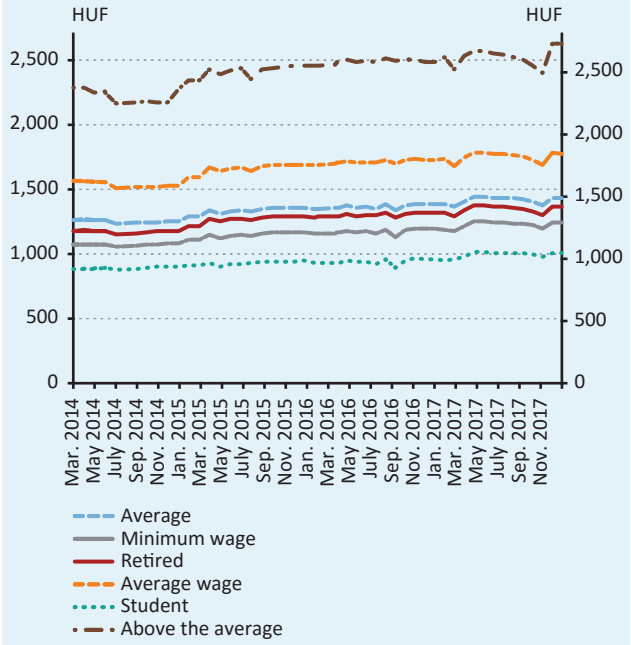
[5] Based on research conducted by the Századvég School of Politics.

Chart 20
Changes in average monthly payment costs of retail customers by type of services



Note: Calculated with the 2014 turnover.

Chart 21
Changes in average monthly payment costs of retail customers by customer segments



Note: Calculated with the 2014 turnover.

countries examined to date, the total amount of monthly payment service fees paid by households is lower on average in nominal terms as well than in Hungary, and only a part of the difference is explained by the transaction levy. Monthly fees usually contain telebank, mobile bank and Internet bank services, regular information about account activity and typically the fees of credit transfers, cash withdrawals and other transactions as well. Schedules of fees in Hungary are significantly different from this pricing practice, as payment service providers apply pricing tied to the value of the transaction in the case of several methods of payment.

The European practice of the pricing of retail payment services is typically based on fixed, package-price solutions. In Europe, the pricing of individual credit transfers can be practically classified into three types. The first one is when free account maintenance is coupled with free credit transfers. The second one is when the account maintenance fee is fixed and any number of credit transfers may be initiated without any further fees related to the transaction. In the case of the third solution, the pricing of credit transfers changes depending on the number of the initiated credit transfers. These solutions relate to fee applications in a package. It can also be established that in pricing the credit transfers that do not require manual intervention, i.e. electronic credit transfers, are preferred.

In order to increase the efficiency of the payment system, the MNB initiates a dialogue with market participants to identify what steps could be taken for a pricing that is more favourable for customers and that encourages the usage of electronic transactions already in the short term. Payment service providers' payment pricing practices do not comply with the typical European patterns, and do not support the objective of the mass spreading of electronic transactions and thus of the increasing of efficiency either. The propagation of instant payment solutions, the conversion of the currently high ratio of cash payments to electronic payments requires the rethinking of the present pricing practices, i.e. the creation of a fee level and structure that clearly motivate customers to increase the number of electronic transactions. Adequate pricing policy is one of the most important success criteria in terms of the electronification of cash payments, which is supported by the fact that the use of almost all already operating European instant payment systems that achieved significant growth in the number of transactions was cost-free for retail customers at least in the initial period. Due to all this, during the year the MNB will continue to analyse the pricing

practices of payment service providers, and will initiate a dialogue with them in order to identify what steps could be taken for a pricing that is more favourable for customers and that encourages the usage of electronic transactions already in the short term.

2.1.6 FINDINGS OF PAYMENT INSPECTIONS

The general experience of the payment inspections conducted in 2017 is that the operation of the examined payment service providers is adequate, although deficiencies were found in each case. In 2017, on-site inspections were conducted at 15 institutions. Based on the inspections conducted and closed in 2017, in parallel with applying measures, penalties amounting to HUF 24 million in five cases were also imposed, while two inspections were completed with imposing obligations laid down in a resolution and establishing the fact of infringement. In 2017 H1, two inspections carried over from 2016 were closed, where in addition to requiring measures to be taken, the inspections were closed with imposing fines amounting to a total HUF 50 million. Of the inspections completed in 2016, in the case of eight institutions in total, the reporting deadline concerning the fulfilment of the obligations prescribed on the basis of the inspections became due in 2017 H1. Credit institutions, with the exception of one, adequately performed, and thus these regulatory payment inspection procedures were closed without applying any further measures. Of the eight credit institutions, in the case of one inspection conducted, the credit institution failed to adequately comply with the required measure; therefore, it was necessary to apply another measure and impose a fine amounting to a total HUF 1 million (Table 3).

Table 3
Main data of the inspections conducted by the MNB broken down by type of institution
(2015–2017)

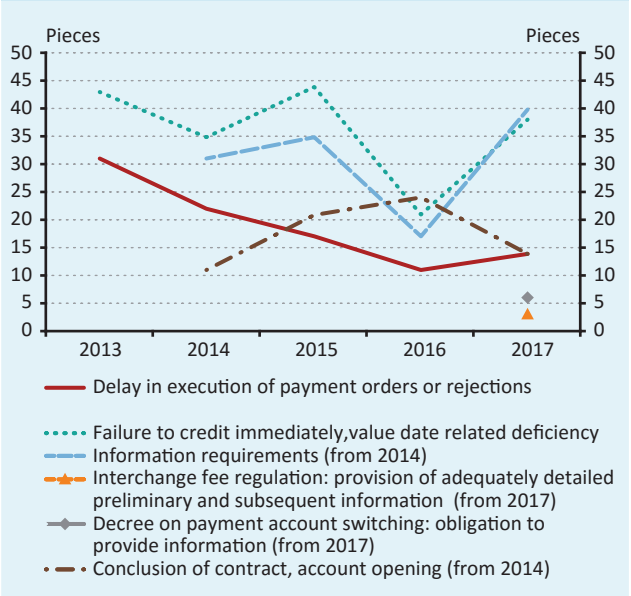
Main data of the inspections	Type of institution	2015	2016	2017
Number of institutions inspected (in the year of the inspection)	Bank	7	2	7
	Specialised credit institution	-	-	1
	Cooperative credit institution	15	13	5
	Other payment service provider	-	-	1
	Voucher issuer	-	4	1
	Total:	**22**	**19**	**15**
Number of findings (in the year of the inspection)	Bank	69	0	67
	Specialised credit institution			6
	Cooperative credit institution	115	88	67
	Other payment service provider	-	-	13
	Voucher issuer	-	6	3
	Total:	**184**	**94**	**156**
Number of obligations required within the framework of measures	Bank	48	0	16
	Specialised credit institution			5
	Cooperative credit institution	78	48	35
	Other payment service provider	-	-	7
	Voucher issuer	-	2	-
	Total:	**126**	**50**	**63**
Number of fines (in the year of the decision-making)	Bank	4	4	4
	Cooperative credit institution	9	3	4
	Other payment service provider			1
	Total:	**13**	**7**	**9**
Amount of fines – HUF million (in the year of the decision-making)	Bank	43.5	24.5	56.5
	Cooperative credit institution	23.2	5.6	15
	Other payment service provider			3.5
	Total:	**66.7**	**30.1**	**75**

Note: The tasks required and the fines imposed within the framework of the measure were summarised and added up for the year of the decision-making in 2017.

Similarly to the previous year, in connection with the Act on the Provision of Payment Services, the most frequent infringements found during the official inspections were related to the opening of payment accounts. Pursuant to the requirements of the Act on the Provision of Payment Services, the contracts to be concluded with customers as well as the information provided prior to signing the contract should contain – inter alia – the rules concerning the essential features of the service, the liability rules as well as those regarding the amendment and termination of the framework contract. The deficiencies found during the inspections in 2017 were most often related to the information provided prior to signing the contract and the requirements concerning the form and content of contracts. In addition, in many cases the contracts contained conditions that were unfavourable for customers, and current accounts were not opened with the documents required by law (Chart 22).

It was found during the inspections that in connection with the rules of conducting payment transactions laid down in the MNB Decree, mainly the rules regarding the immediate crediting of the amount of the payment transaction are not obeyed by the payment service providers Similarly to the previous years, the amount of payment transactions is still not always made immediately available for the beneficiary in the case of postal cash transfers, FX transfers and crediting initiated with payment cards. The violation of this provision is strictly judged by the MNB as the level of development of the information technology has allowed much faster processing in banks' systems since the publication of the relevant legislation. Other frequent mistakes are observed in the compliance with provisions related to the handling of transfers of funds by court order and the execution of payment orders (Chart 22).

Chart 22
The most frequent non-compliance cases in payments
(2013–2017)



In the case of the Interchange Fee Regulation, the most frequent infringement was related to the provision of adequately detailed preliminary and subsequent information to acquirers. In 2017, compliance with the Interchange Fee Regulation was inspected at the examined cooperative credit institutions and at five payment service providers. The inspections revealed that during the preliminary provision of information and the concluding of contracts the fees to be charged on the various categories and brands of payment cards were not adequately detailed as required by the regulation. In the case of the subsequent information a deficiency is that in the amount of fees charged for card-based payment transactions the amounts of the merchant service charge and the interchange fee were not indicated separately, and on the issued bank cards the type of the card was not always shown, and thus it did not allow points of sale to clearly identify the brand and category of the bank card that the paying party intended to use (Chart 22).

In the interest of customers, the MNB started the inspection of the compliance with the Decree on payment account switching; the inspection revealed inadequate practices of some institutions. The MNB paid special attention to checking the compliance with the decree, as the observance of the provisions of the Decree on payment account switching facilitates the acceleration and simplification of the previously slow and cumbersome process of switching payment service providers, and thus the increasing of competition in the field of payment services. During the regulatory inspections in 2017, the MNB found that credit institutions refused the termination of accounts, which is related to and can be considered the last step of the process of switching accounts, on several occasions even in cases when it is not allowed by law. The most frequent reason for the refusal was related to the existence of payment card or other services (Internet bank, texting service), i.e. in the cases where a payment card belonged to the customer's previous account, and thus credit institutions refused the termination of the account with reference to that. However, upon creating the decree, the legislator's intention was laid down that switching banks should be as comfortable and smooth for customers as possible, and it has to be ensured in a way that the payment services provided to consumers should not be interrupted during the switching of accounts. A further deficiency was that most of the expected institutions did not meet the obligation to provide information for easing

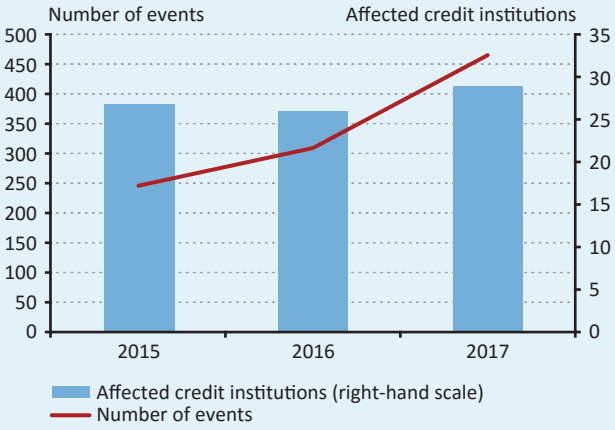
the cross-border switching of accounts. In one case the given institution did not work out the process of switching accounts at all. As of 2017, the MNB's inspection activity was extended to verifying the observance of certain provisions of the Decree on basic payment accounts as well, in addition to the Decree on payment account switching. Of the examined institutions, the inspection of the Decree on basic payment accounts took place at all credit institutions obliged to manage basic payment accounts. During the inspections conducted, the MNB found irregularity on one occasion, when in addition to the maximum monthly fee determined in the Decree on basic payment accounts, another fee was also charged, which the credit institution would not have been allowed to impose pursuant to the relevant legislation (Chart 22).

Based on the experiences of payment inspections, the MNB Decree on payment transactions was completed with some new rules, making it clearer. In addition to infringements of the law, the payment inspections also unveiled some practices that affected the effectiveness of the legislator's intention. In order to terminate these practices, the MNB Decree on payment transactions was completed with some new rules. Moreover, in order to promote law-abiding conduct, certain provisions were made more specific and clearer. Of them, special attention needs to be paid to the new provision that enters into force on 1 July 2018. Pursuant to this provision, in domestic forint payments the payment service provider may refuse the execution of payment orders where funds are insufficient the earliest after 16 hours on the working day of the debiting. This will terminate the practice that is observed at several inspected payment service providers and is disadvantageous for customers that the execution of payment orders given in advance (typically regular credit transfers and direct debit orders) is refused due to lack of funds already at the beginning of the working day, in spite of the fact that funds may be credited to the customer's payment account during the working day, and thus his payment order could have been executed on the given debiting day. In order to ensure uniform practice, the provisions concerning the time period of the queuing of uncovered payment orders became clearer, and for providing adequate information to customers, the rules regarding the fixing and announcement of the starting and closing times of the working day were determined more precisely.

2.1.7 PAYMENT MALFUNCTIONS AT PAYMENT SERVICE PROVIDERS IN 2017

Although the number of payment malfunctions has been growing in the banking sector for years, compared to the number of payment service providers and the complexity of the financial infrastructure, the number of cases is still low. The number of incidents reported by credit institutions increased steadily in the past years (Chart 23). In 2017, the MNB received information on 467 incidents at 29 credit institutions in total. During the year, the average duration measured from the occurrence of the incidents until their resolution was 11 hours and 3 minutes, which is nearly one and a half hours longer than the time measured in 2016. This rise is mainly attributable to one bank's three extremely long down-time periods related to Internet banking, mobile banking and call centre. The long incidents did not result in customer complaints because only some of them were affected, and not continuously, just temporarily. The duration between the occurrence and noticing of incidents increased further, by nearly half an hour to 4 hours and 12 minutes.

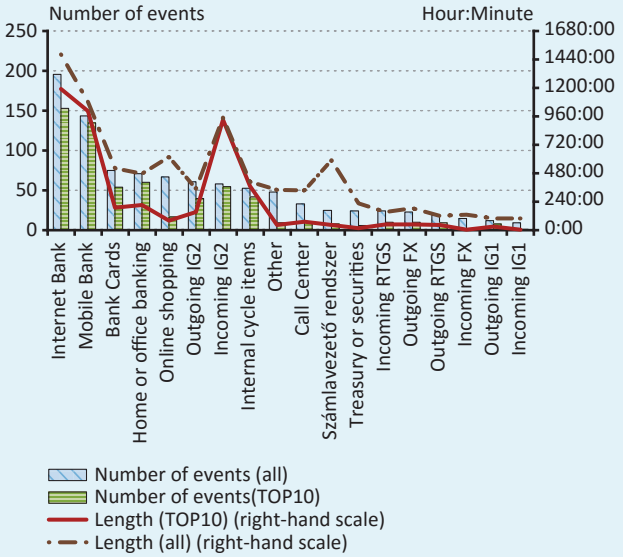
Chart 23
Number of incidents at payment service providers and the number of credit institutions affected by such
(2015–2017)



Payment incidents in 2017 affected Internet banking and mobile banking systems to a greater degree than other systems. Based on the incident reports submitted, an incident usually had an impact on more systems at the same time.

Incidents related to Internet banking, mobile banking, bank cards and home banking occurred much more often at the TOP10 payment service providers than at the smaller ones. At the same time, incidents related to central systems (treasury, account management system) and customer service call centres are more typical of smaller service providers. Similarly to the previous year, more than 50 percent of the incidents affected the Internet banking and mobile banking systems as well in 2017. These malfunctions limited customers – inter alia – in the initiating of credit transfers, in account history query as well as in using other mobile banking services (Chart 24).[6] In 2017, half of the total duration of incidents concerning Internet banking was related to a concrete incident at a TOP10 credit institution, during which for nearly one month some customers only had access to the service through a bypass solution. In a significant number of cases the unavailability of systems was caused by overload (significantly higher quantity of data to be processed than the average or denial-of-service attack). Another significant portion of incidents was related to applications (malfunction, unexpected crash, memory leak). In the case of hardware errors, automatic change-over to the backup system was not always successful. Fewer incidents were caused by various human errors (withdrawal of authorisation by mistake, faulty configuration, expiring certificates, modification in live system instead of test system). Errors occurring during the sending of authenticating text messages caused incidents in 22 cases. In 2017, the number of errors related to payment cards and ATMs grew, but their ratio did not increase further.[7] A significant portion of errors were caused by network failures (connection errors, wrong settings, faults at external service providers), 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 actors (card companies, merchants, credit institutions, telecommunication companies etc.).

Chart 24
Number and duration of payment service providers' malfunctions broken down by activity, highlighting the data of the TOP10 payment service providers
(2017)



[6] In 2017, 196 incidents were related to Internet banking, 144 incidents to mobile banking and 71 to home or office banking services.
[7] The incidents concerned bank cards or ATMs in 11 percent of the cases (27 cases) in 2015, 19 percent (62 cases) in 2016 and 16 percent (75 cases) in 2017.

2.2 Operation of financial market infrastructures

2.2.1 TURNOVER OF FINANCIAL MARKET INFRASTRUCTURES

Compared to the previous year, the number of payment transactions executed in the overseen systems increased by one and a half percent, while the value of the turnover grew by 5.7 percent in 2017. On the whole, the turnover amounted to 40 times the annual GDP (Table 4). In 2017, VIBER, the ICS and KELER CCP saw an increase in the number of transactions, while the turnover declined in the case of KELER CSD. The total value and the number of transactions in VIBER increased by 11 percent and 1 percent, respectively, relative to the previous year. The rise in the total value of the turnover was attributable to the increase in the per transaction value of central bank tenders as well as O/N and other preferential deposits placed with the MNB. Similarly to the previous year, the slight increase in the number of transactions was mostly the result of a rise in the number of customer transactions. In terms of the number of transactions, the ICS turnover reached a 3 percent increase, with a 6 percent rise in value. The expansion in transactions shows significant differences across settlement platforms and transaction types. The growth was the result of the individual credit transfers of intraday clearing (4 percent) as well as the direct credits of intraday and overnight clearing (9 percent and 10 percent, respectively). By contrast, direct debits declined (by 4 percent). The turnover of KELER Ltd. was down both in terms of the number of transactions executed (by 2 percent) and their forint value (by 18 percent). This was mainly attributable to the decreased number and value of repo transactions due to the low interest rate environment. As of March 2017, on 52 settlement days in total, KELER CSD's turnover on the TARGET2-Securities pan-European securities settlement platform (T2S) comprised 263 transactions with a value of HUF 327.23 billion. The value and number of capital market transactions cleared by KELER CCP increased by nearly 4 percent and more than 16 percent, respectively.

The total value of foreign exchange (FX) transactions containing a forint leg, settled in the CLS system, rose by more than sixty per cent between 2016 and 2017. While in 2016 the Continuous Linked Settlement (CLS) settled 55 thousand foreign exchange transactions where one of the legs was forint, in 2017 this number ran to 81 thousand. In addition to the growth in the number of transactions, the total settled value also rose: in 2016 FX transactions with a forint leg were settled in CLS in an average daily value of HUF 273.2 billion, while in 2017 the daily turnover reached HUF 432.4 billion. It follows from the operation of the CLS system that instead of these gross values only the net positions had to be covered by real payment flows; thus the one-way net forint turnover executed in VIBER (the Hungarian RTGS) in relation to CLS was merely HUF 55.5 billion and HUF 73.9 billion in 2016 and 2017, respectively. This also means that the average netting efficiency rose from 76 to 80 percent in one year (Chart 25). The rise in the turnover is attributable to the growth in the number of CLS members settling their forint transactions in CLS: at end-2017 already twenty-four of the

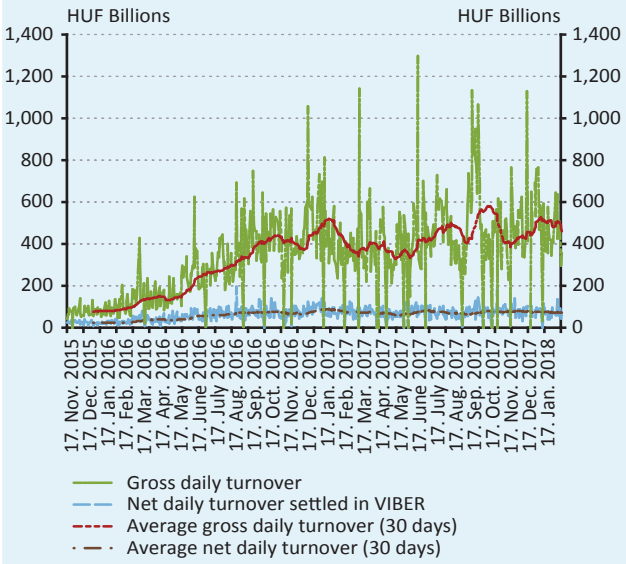
Table 4
Turnover and main figures of the domestic financial market infrastructures
(2016–2017)

Overseen systems		Volume (thousand)		Value (HUF thousand billion)		Turnover/GDP		Participants (2017)	
		2016	2017	2016	2017	2016	2017	direct participants	indirect participants
VIBER		1,472	1,545	1,113.1	1,234	31.58	32.32	46	22
ICS	overnight clearing	160,492	149,529	13.7	15.8	0.39	0.36	37	34
	intraday clearing	173,847	190,176	82.9	86.7	2.35	2.17	37	34
KELER CSD		538	697	240.7	196.4	6.83	5.14	137	n.a.
KELER CCP*		1,673.1	1,731.8	5.1	5.3	0.14	0.13	138	n.a.

**The data are for the capital market.*

Note: The ICS overnight clearing turnover does not include the so-called non-clearing items that do not entail any payments, as they are only technical transactions, which have an impact only on the capacity and efficiency of the system.

Chart 25
Daily gross forint turnover settled in the CLS system and the related net forint turnover settled in VIBER
(17 November 2015 – 16 February 2018)



sixty-seven CLS members participated in forint settlements, for the management of which five local credit institutions provided them with nostro services.

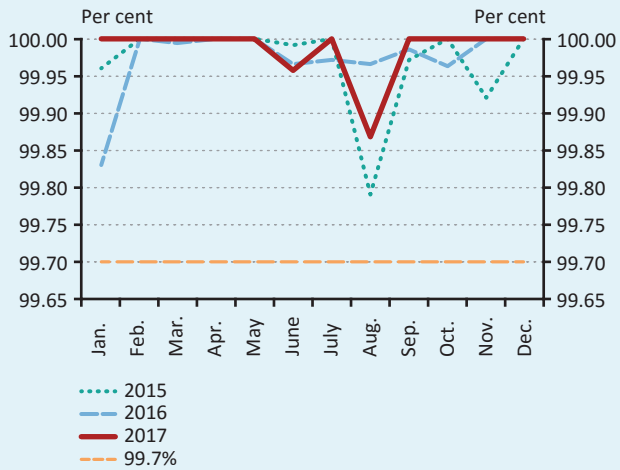
2.2.2 SERVICE CONTINUITY RISK OF FINANCIAL MARKET INFRASTRUCTURES

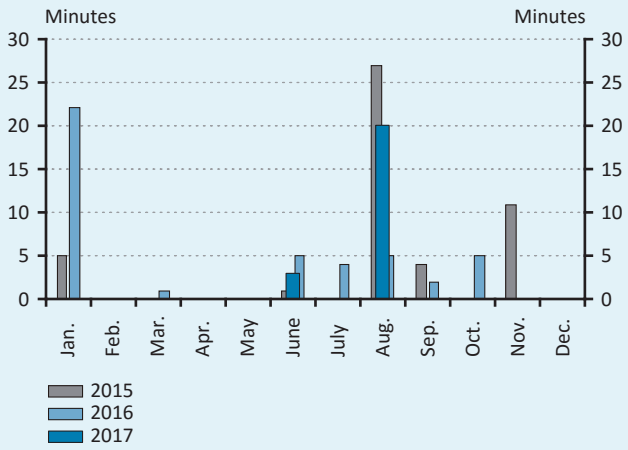
The overseen financial market infrastructures worked efficiently and safely in 2017, supporting the functioning of money and capital markets with their high availability. The systems operated in a robust manner during the whole year, but compared to the previous year, the availability of KELER CSD, KELER CCP and the ICS deteriorated slightly, while that of VIBER improved. With increase in the recovery time of incidents, the operational risk was slightly up in the overseen systems in 2017. The CLS and T2S financial market infrastructures, operated safely and efficiently, similarly to the domestic systems.

In 2017, VIBER operated in a highly reliable manner. Compared to the previous year, the risk of service continuity declined further, with a significant decrease in the number of complete outages and individual incident times of the core settlement service. In every month, the availability ratio of VIBER remained above 99.7 percent, which is the requirement in the oversight practice in Hungary (Chart 26), and declined to below 100 percent only in two months, which is a significant improvement compared to the seven occasions in the previous year. Similarly to the previous year, short (1–2-minute) complete service outages[8] occurred on several occasions mainly due to network failures in 2017. The time between the start and the end (recovery) of incidents declined slightly compared to 2016, with the longest downtime lasting for 20 minutes compared to 22 minutes in the previous year. Following the incidents, the system operators drew the lessons, and, where considered necessary, gave proposals for the avoidance of incidents in the future.

The ICS overnight and intraday clearing operated in a reliable manner during the whole year, although there

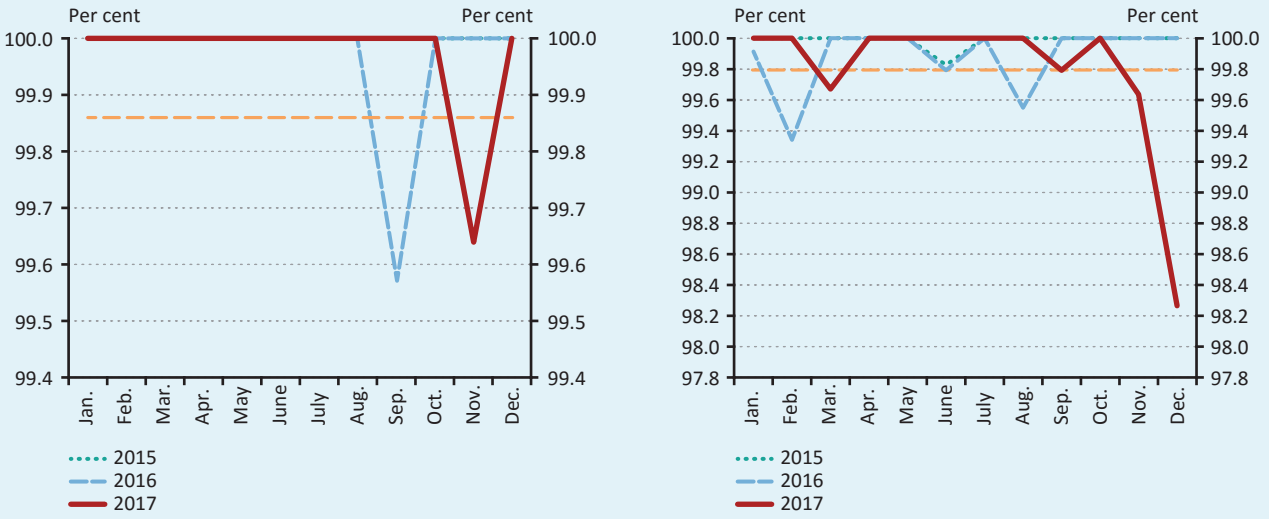
Chart 26
Monthly availability ratio of the core settlement service in VIBER (left-hand chart) and aggregate duration of outages of the core settlement services in minutes (right-hand chart)
(2015–2017)





[8] Complete service outage means that the VIBER service does not operate during the period of the incident for the participants.

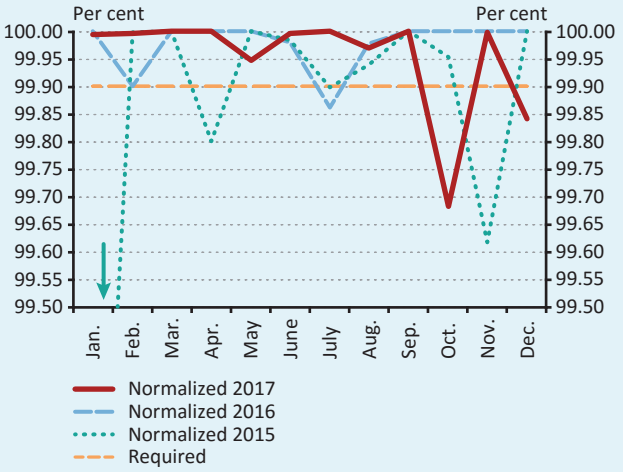
Chart 27
Impact of overnight (left-hand chart) and intraday (right-hand chart) clearing incidents on availability
(2015–2017)



were some incidents that reduced the availability. Both clearing systems of the ICS processed the items very fast and with adequate efficiency, but a number of events took place during which the availability ratio[9] fell to below the undertaken service level (Chart 27). We consider the incident that took place in December serious, as due to it the normal operation of intraday clearing was re-established only at the beginning of the fifth cycle. Of the six incidents that occurred in 2017 – of which two affected the overnight clearing and four affected the intraday clearing – one overnight incident did not have an impact on availability, while in the remaining five cases – similarly to the incidents of the previous year – the underlying reasons were detected within the shortest time possible.

According to KELER CSD's calculations, the number and duration of incidents perceptible for customers are still low; the securities depository operated with outstanding availability for customers in 2017 as well. Last year, KELER CSD's availability was below the required level of 99.9 percent in two months (Chart 28). Accordingly, compared to 2016, the availability of KELER CSD's services for customers declined slightly, but it was practically almost imperceptible for customers. The reason for the decline was that compared to 2016 the number of incidents affecting the information technology systems supporting business operations increased. Nevertheless, KELER CSD solved the incidents in a professional manner and in a shorter time than before. The measures taken as a result of the investigation of the incidents are expected to contribute to increasing the unification of the currently fragmented IT infrastructure and preventing the recurrence of faults in the future.

Chart 28
Availability of KELER CSD central securities depository for customers
(2015–2017)



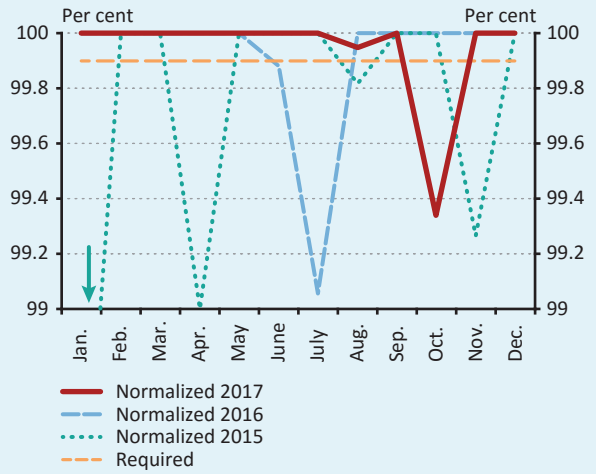
Note: The availability was 98.7 percent in February 2015.

According to the calculations of KELER CCP, the level of providing its business services increased compared

[9] 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.

to 2016, as a result of which it continued to ensure high availability for customers. There is an outsourcing agreement between KELER CCP and KELER CSD for operating the IT systems. Under the agreement, the infrastructure required for the provision of central counterparty services is operated by the depository. At the same time, compared to 2016, the slightly higher number of incidents affecting KELER CSD's IT system only had a minor impact on the availability of the business activities of KELER CCP last year. As a result, instead of the two occasions recorded in 2016, there was only one month when it was unable to fulfil the expected availability level of 99.96 percent (Chart 29).

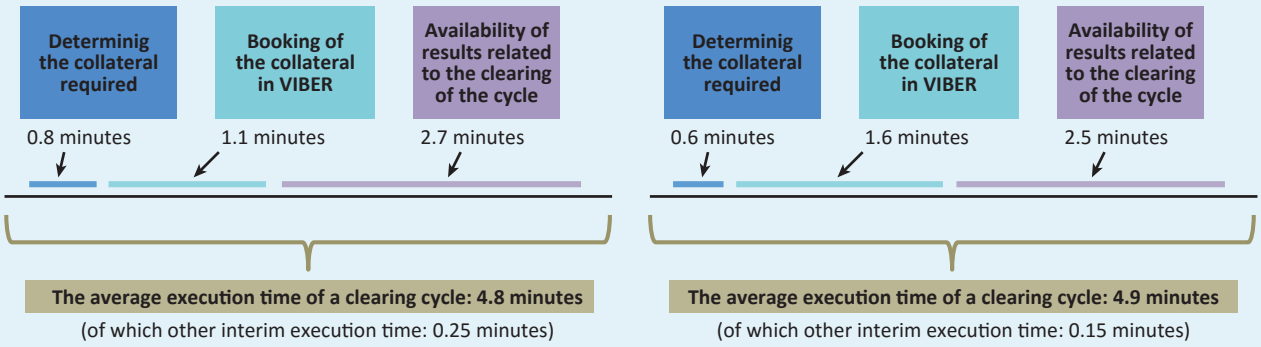
Chart 29
Availability of KELER CCP central counterparty
(2015–2017)



Note: In January 2015, the availability ratio amounted to 98.1 percent.

The execution time of the clearing and settlement of transactions in the payment systems met the expected efficiency requirements. At present, some of the execution time of domestic payment orders is greatly influenced by VIBER's processing capacity, as in addition to executing its participants' payment transactions, it also serves the settlement of the clearing of the related financial market infrastructures. Accordingly, an important part of the execution time of payment transactions is how fast VIBER performs the settlement. The execution time of VIBER transactions is calculated on the basis of the time stamps on SWIFT messages.[10] If sufficient cover is available on the participant's payment account, the average execution time of interbank and customer transactions is 12 seconds, whereas the cash leg settlement of securities transactions and the settlement of the ICS intraday clearing cycle require less than 16 seconds. The time requirement of credit line modifications is higher than this (2–3 minutes), given that the collateral assessment module of the client account management system of the MNB is also involved in the process. Responses to VIBER participants' inquiries were received within 17 seconds on average, and cancellations take about the same time. In the intraday clearing of the ICS, similarly to the previous year, the average execution time of a cycle was 4.9 minutes (Chart 30). The maximum execution time without an incident did not exceed 18 minutes even in the first cycle, which processes the largest number of transactions. The other duration important from the aspect of ICS clearing is the time needed for determining the collateral amounts required for the settlement in VIBER[11] of the transactions accepted for the given cycle. It took less than half a second, and it only slightly exceeded one minute even in the cycle with the highest number of transactions.

Chart 30
Time requirement of the ICS intraday clearing process (2016 – left-hand chart; 2017 – right-hand chart)



[10] The method measures the time elapsed between the time stamp of the individual transaction received by the MNB via SWIFT and the time stamp of the response message sent via SWIFT following the transaction's settlement in VIBER (confirming settlement).

[11] Clearing in the ICS is considered executed when the debit balance of the participant is booked on its payment account with the MNB. This booking is based on the collateral amount which determines the amount to be debited to the payment account of a participant for its turnover in a given cycle. This collateral amount must be available as liquidity in VIBER.

Box 2
Cyber security

The preparations against cyber attacks are being expanded with various new and important elements. The MNB has participated in the ECB working group dealing with the cyber security of financial market infrastructures for years. Last year, the working group assessed and evaluated the preparedness of all relevant European financial market infrastructures; the assessment in Hungary was coordinated by the MNB. The working group also made specific proposals for remedying the deficiencies observed. The MNB took these proposals into account when it updated the IT-related expectations concerning the systems. Not long ago, with the participation of market players and European regulatory authorities, an international working group dealing with cyber security was set up. Its objective is to strengthen the cooperation of the participants and to facilitate simpler and faster information sharing. In addition, the ECB is setting up a framework (TIBER-EU) for the standardised testing of cyber resilience, taking the Dutch TIBER-NL and the English CBEST frameworks as a basis. Relevant authorities within the EU may apply the TIBER-EU framework on a voluntary basis, and the institutions invited may participate in the testing on a voluntary basis. The objective of the framework is to provide a single framework for the ethical hacking of critical financial market infrastructures as well as to allow the testing of organisations/institutions/systems that are supervised by various authorities and conduct cross-border activities. The essence of the framework is that ethical hacker teams will attack live systems in a controlled environment in a way that only the minimum sufficient number of people will know about it at the given institution. The preparations for the targeted attacks will be preceded by deep data collection. Various techniques (e.g. phishing, shoulder surfing) may be put into action during the attack in addition to the technical attacking of the concrete infrastructure so that the simulated attack can be as similar to a real one as possible. Following the testing, the ethical hacker team shares its experiences with the given organisation, and thus the latter can develop its defence, detecting and response capacities, and it will be possible to share some of the findings in an anonymous manner with the other organisations that operate critical infrastructure.

2.2.3 CLEARING AND SETTLEMENT RISK OF FINANCIAL MARKET INFRASTRUCTURES

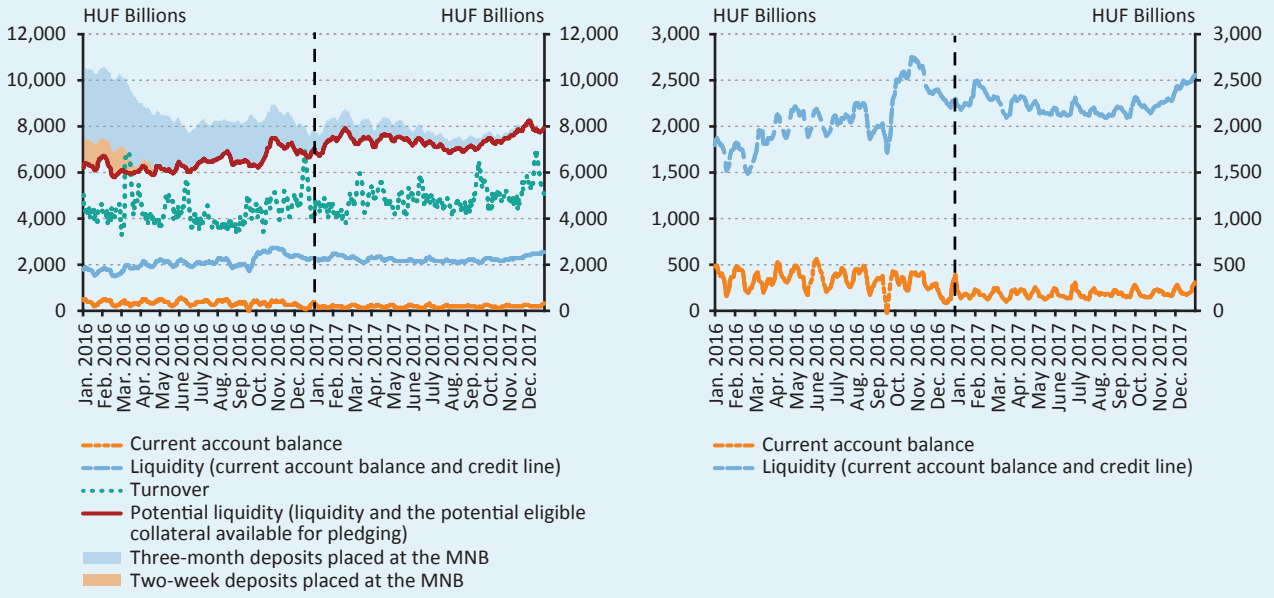
2.2.3.1 Clearing and settlement risk in VIBER and the ICS

The clearing and settlement risk did not increase in the payment systems in 2017; liquidity was sufficient for the execution of payment transactions both at system and individual bank levels. Liquidity in VIBER and the ICS is essentially determined by the same factors; any changes in these factors equally affect both systems and their participants. The direct participants of both systems are largely the same, given that clearing in the ICS is settled in VIBER on the participants' payment accounts held with the MNB. Consequently, participants use the same liquidity for the execution of payments in both systems: the account balance available on their payment accounts and the intraday credit line provided against their security portfolios pledged to the MNB.

2.2.3.2 Effect of factors determining the liquidity of VIBER and ICS participants

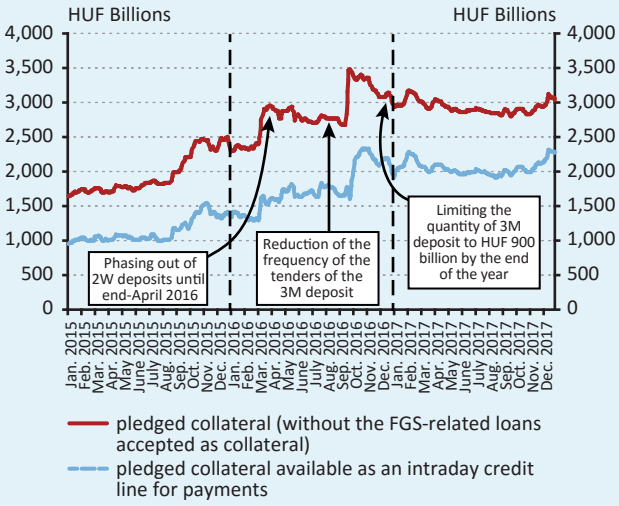
As a result of the reduction of the frequency of the tenders of the three-month deposit in August 2016, the system-level credit line for payments settled at a higher level, while due to the reduction of the required reserve ratio the payment account balance became stable at a lower level. On the whole, payment system participants still have extremely high liquidity reserves, which they further increased in 2017. Only slight adjustments can be observed regarding the structure of aggregate liquidity. As a result of the reduction of the three-month deposit facility tenders' frequency as of August 2016 and of the quantitative limit subsequently imposed on them, in September 2016 (when the last tender without quantitative limit was held) there was high demand for this instrument, thus significant amount of liquidity was withdrawn from the system. The quantitative restriction on the three-month deposit facility continued in 2017, thus the total amount of three-month deposits declined to HUF 75 billion by the end of the year. As a result, some of the liquidity thus becoming

Chart 31
Changes in the account balance and liquidity, potential liquidity and turnover of VIBER members (left-hand chart), highlighting the developments in the account balance and payment liquidity (right-hand chart)
(2016–2017)



available appeared in an increase in government securities holdings and other assets (e.g. overnight deposit, preferential deposit). With the decline in their account balances, payment system participants would not have been able to ensure their daily turnover, thus they were forced to increasingly rely on their credit lines, for which in 2017 H2 they increased their pledged security collateral – serving as cover for the credit line – and also the additionally pledgeable securities holdings in their balance sheet. So the pledged government securities increased from HUF 2000 billion in mid-2017 to nearly HUF 2300 billion by year-end, while the additionally pledgeable securities expanded from HUF 3000 billion in early 2017 to some HUF 3500 billion by the end of the year. The total holdings of pledgeable securities rose by some HUF 1000 billion throughout the year thus potential liquidity[12] reached the highest level of the past 3 years, exceeding HUF 8000 billion[13] (Charts 31, 32 and 33).

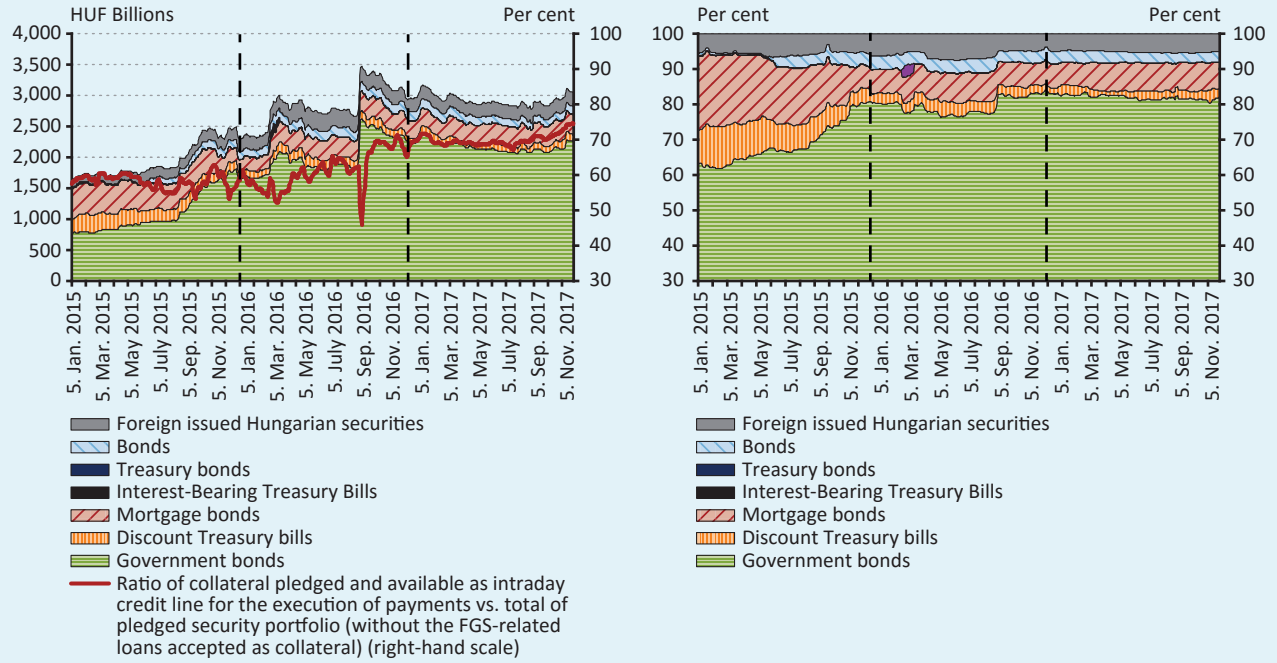
Chart 32
Impact of changes in the monetary policy on collateral available in the payment systems
(2015–2017)



The turnover of the ICS intraday clearing cycles is balanced, consequently the potential clearing and settlement risk is low, despite the high number of transactions. The first cycle of intraday clearing has the highest number of transactions to clear since this is when the (mostly retail) credit transfers – initiated after the closing of the previous business day – are cleared. During the holidays in December, a significant 14 per cent increase of the number of transactions in the 1st business cycle could be observed compared with the same period, prior year. This was coupled with a 37 percent

[12] From the perspective of payment systems, potential liquidity is the sum of the account balance of the VIBER participant's 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.
[13] Excluding the two-week and three-month deposits.

Chart 33
Pledged securities and their distribution by type (right-hand chart) and the ratio of credit line to the total pledged collateral (left-hand chart)
(2015–2017)



rise in value, but the number of transactions grew by an average 7.5 percent in the other months of the year as well. In terms of value, a significant portion of the turnover is still concentrated in the eighth and ninth cycles, but with the decline in total turnover value per cycle resulting from the increased frequency of the cycles, the clearing and settlement risk has remained at a low level. In 2017, the debit turnover of intraday clearing accounted for an average 0.64 percent of the total liquidity available in the system. The ratio of turnover to total liquidity exceeded the average only on tax payment days and at the end of the year, when the turnover is traditionally higher, but even in the December period – which had been a peak every year in terms of monthly volume – it did not reach 2 percent of the total liquidity.

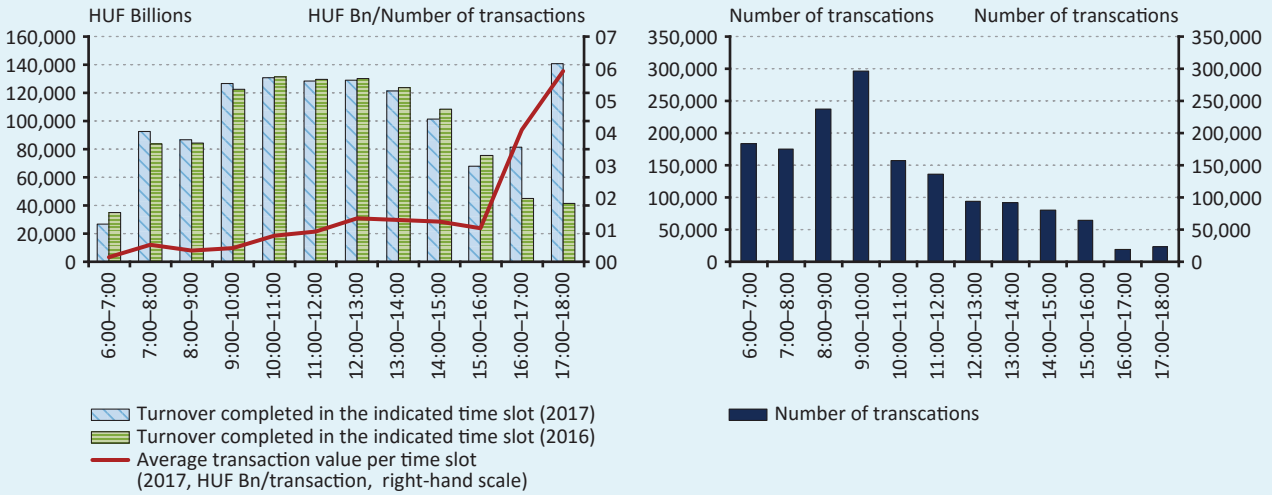
2.2.3.3 Liquidity management of VIBER and ICS participants

Payment system participants managed their liquidity in an active and efficient manner in 2017 as well. Adequate allocation of their intraday liquidity required to execute payments continues to be important for mitigating clearing and settlement risk. The extent to which participants rely on their account balance and credit line in the execution of payment transactions, and when they send their transactions in the system during the day depends on their respective liquidity management strategy and balance sheet total, the stock of securities on their balance sheets available as eligible collateral and the level of the required reserve ratio. If sufficient liquidity is not available for conducting their turnover, transactions may queue up in VIBER, and roll-over of transactions between cycles in the ICS may take place.

A significant change compared to 2016 is that the execution of higher-value transactions in VIBER takes place in the late afternoon or evening hours, and one tenth of the daily turnover is executed during the 1 hour prior to the day-end closing of VIBER. Intraday developments in the value of VIBER turnover follow a normal distribution; around 60 percent of the turnover takes place between 9:00 and 15:00 hours. By contrast, the number of transactions is concentrated in the morning hours; nearly 67 percent of the daily number of transactions are already carried out by 11:00 hours (distribution is typically left-skewed). Overall, a significant change compared to the previous year is the postponement of transaction timings. Accordingly, VIBER participants initiate their higher-value items to be executed typically after 16:00 hours,[14] generating a considerable portion (11 percent) of their daily turnover between 17:00 and 18:00 hours.[15] Following September 2016, a nearly 20

[14] Within the daily total turnover the share of their turnover executed after 15:00 hours increased from 8 percent in 2016 to 18 percent in 2017.
[15] Within the daily total turnover the share of their turnover executed between 17:00 and 18:00 hours increased from 4 percent in 2016 to 11 percent in 2017.

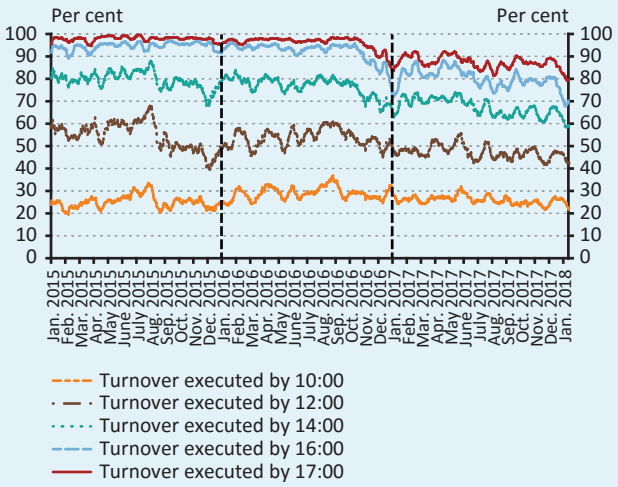
Chart 34
Intraday developments in the value and average transaction size (left-hand chart) as well as the number of transactions (right-hand chart) of the VIBER turnover broken down by hour
(2017)



percentage point postponement is observed in the timing of the launching of transactions. This phenomenon may be attributable to the quantitative limit on the three-month deposit and the increase in liquidity resulting from the FX swap tenders. As a result, knowing that there was ample liquidity in the system, banks launched their transactions later and preferred to rely on the financing role of the payment items sent to one another (Charts 34 and 35).

In 2017, VIBER participants' MICL-levels (maximum utilisation of the intraday credit line)[16] mainly remained unchanged, the absolute size of the credit line used for payment execution declined at system level, and participants used their credit line for a shorter period of time compared to prior year. The MICL is still considered low (4–14 percent) at system level, and remained practically unchanged compared to the previous year. On an individual bank basis, the MICL figures still vary considerably; in general, banks with high turnover and/or low balance sheet total tend to have high MICL values. In the case of the 5 VIBER participants that use the credit line the most, an average 10 percentage point increase is seen in the MICL, but more than half of the participants do not use their respective credit lines at all or only rarely. In addition to the MICL, it is important to analyse the extent to which members utilise their credit lines and the duration of utilisation during the day. In 2017, the average value of the utilisation of intraday credit lines was down by 30 percent (HUF 88 billion) compared to the previous year.

Chart 35
Timing of turnover in VIBER (what portion of total daily turnover is completed until a specific point in time)
(2015–2017)



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

In addition, participants used the credit line 10 minutes shorter on average to ensure their liquidity, so in all they used it for a total 2.5 hours on average every day.[17] Just like prior year, the use of intraday credit line depended on mainly two factors in 2017 as well, most notably: the company form of the sender participant and the time of the day the transactions were submitted into the RTGS.

[16] Credit line utilisation shows the portion of the total available intraday credit line a bank has used on a given business day. The lowest intraday current account balance is compared to the available credit line and as such, it is considered to be a snapshot.
[17] These values only apply to the banks that actually used their credit lines for managing their payments.

Credit line utilisation during VIBER business hours in 2017 was different compared to the previous year's pattern, it tended to be lower mainly in the afternoon hours (Chart 36, left-hand side). Following the opening of VIBER and during the day until 14:00 hours it is the domestic banks that use their respective credit lines to a greater extent. Following that, between 14:00 and 15:00 hours, branch offices and domestic banks use the credit line in a similar manner. After 15:00 hours, branch offices' credit line utilisation activity is higher, although following the closing of customer transactions domestic banks tend to be more active again. In the case of domestic banks, the value of credit line utilisation gradually declines already after 12:00 hours until the end of the day, while this behaviour is typical of branch offices after 16:00 hours. Similarly to the previous year, branch offices' intraday credit line utilisation is more balanced than that of domestic banks (Chart 36, right-hand side and Chart 37).

The payments to CLS caused no liquidity problems in VIBER in 2017 either, thus the related clearing and settlement risk is still low. Since the Settlement Members (SM) of CLS have not joined VIBER, in 2017 they provided the cover for the CLS settlement related to their forint FX transactions through 5 VIBER participants, acting as their nostro agents. In 2017, the number of nostro agents rose by one VIBER participant. Due to the operational features of CLS, settlement-related payments to and from the system

Chart 36
Utilisation of intraday credit lines in VIBER, considering each participant – data compressed into a one-day time window (left-hand side, 2016 - 2017) and broken down by company form (branch offices and domestic banks, right-hand side, 2017)

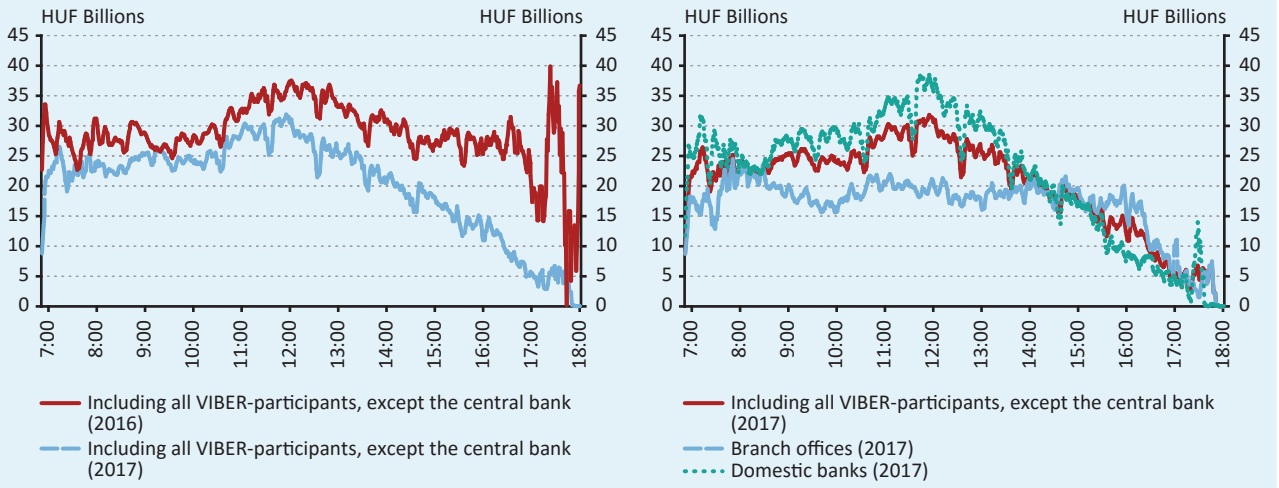
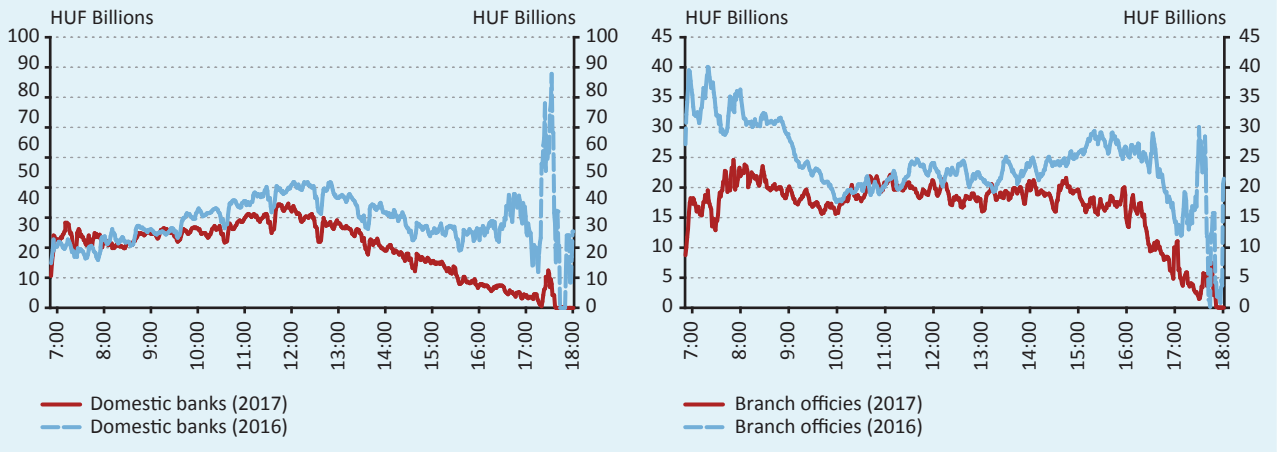
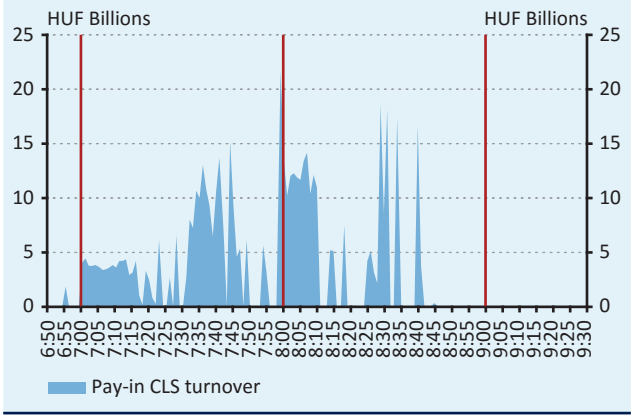


Chart 37
Utilisation of intraday credit lines in VIBER – data compressed into a one-day time window –, with data broken down by company form
(2016–2017)



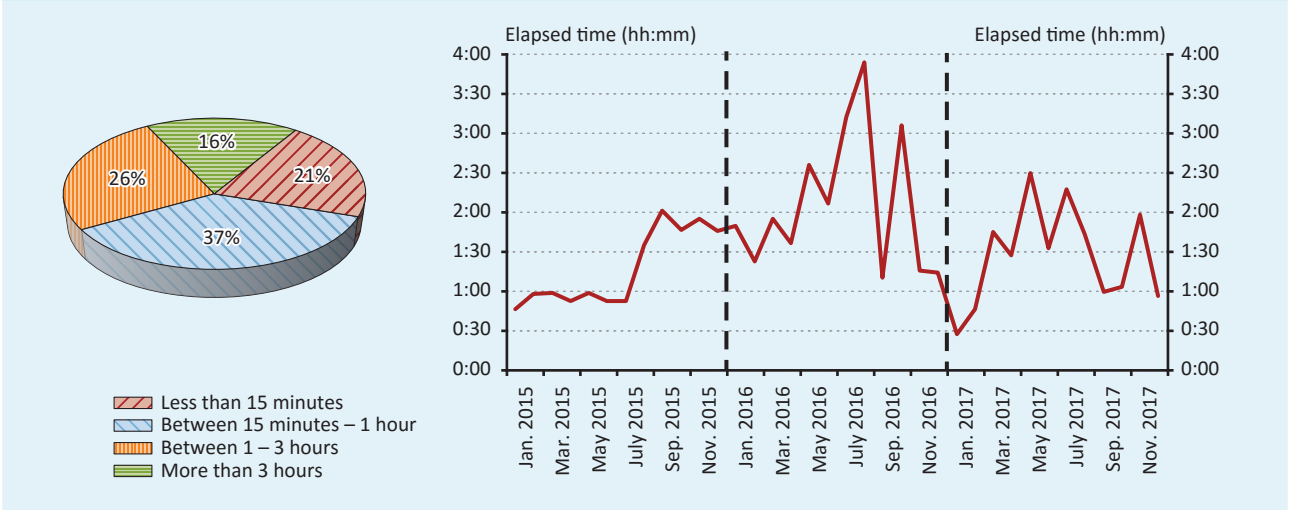
take place in the morning hours, i.e. payments to the VIBER account of CLS must be completed in 2 time bands specified by CLS: 7:00 - 8:00 and 8:00 - 9:00. The daily average turnover of the payments to CLS in the period under review reached HUF 76 billion,[18] accounting for 1-2.5 per cent of the total VIBER turnover settled on the given day (Chart 42). In 2016, in spite of the substantial turnover, nostro agents made their CLS-related payments mostly relying solely on their account balances. Credit lines were utilised rarely and only to a negligible degree (the average credit line utilisation of VIBER participants acting as nostro agents in the period of paying to CLS was around 0.02–1.1 per cent).

Chart 38
Daily distribution of the average turnover value of payments to CLS
(2017)



Compared to 2016, the number of queuing increased in 2017, while the average time spent in the queue declined by 20 minutes. On the whole, the clearing and settlement risk became lower. Transactions initiated by a bank are placed in a queue until sufficient funds become available for execution (e.g. as a result of the financing effect of received, credited transactions or credit line increases or queue rearrangement). The fact of queuing in itself does not necessarily mean that a participant has a liquidity problem, as the existence of the queue is a natural part of the operation of real-time gross settlement systems. Therefore, based on an examination of queues, it can be decided whether there is an actual liquidity problem behind or the queuing is attributable to individual banks' liquidity management practice. Compared to 2016, the number of queued items increased by 58 percent, and this growth took place mainly because of one VIBER participant. A total of 3.243 VIBER transactions queued in 2017, which is still only one third of previous years' magnitude. Although queuing occurred in 94 percent of the working days, the time spent in the queue declined by some 18 percent. The items queued up for one and a half hours on average, i.e. 20 minutes less than in the previous year (Chart 39). Within the day, queuing typically started in the first two–three hours after the opening of VIBER,[19] i.e. one hour later on average compared to the previous year. The transactions were out of the queue by 12:00–12:30 the latest, typically half an hour later than in 2016. Partly reflecting the various liquidity management practices,[20] there are significant differences

Chart 39
Average daily duration of queues
(2017)



[18] Taking into account both payments to CLS and payments initiated by CLS, the daily average turnover doubles, i.e. increases to some HUF 153 billion. This is 2-5 per cent of the daily average VIBER turnover.
[19] Transactions got into queue extremely late (at around 11:30) in September.
[20] Based on its own decision, a participant may pledge additional securities, may rely more heavily on the financing role of incoming items or may choose to leave the transaction in the queue.

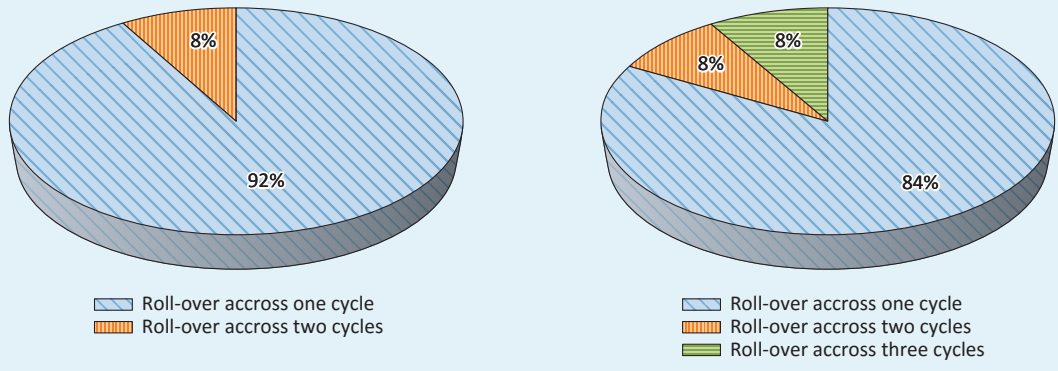
among VIBER participants in terms of the duration of queuing. Banks with a high monthly queuing frequency are typically participants with active liquidity management and high credit line utilisation, whose transactions tend to be queued up for an average 60 minutes a day, which is shorter time compared to 2016. Participants whose liquidity management is less active (and execute their payments without relying on their credit lines at all) queue up for a longer time with their transactions, for 1–5 hours on average. Such long queues are undertaken deliberately, quite often due to business decisions. As the VIBER turnover of these participants is low, their lengthy queuing did not increase the clearing and settlement risk in the system because they did not cause any liquidity related issues for other participants. In 2017, there were no gridlocks in VIBER.

The frequency of roll-overs between cycles and the number of participants concerned remained unchanged in the ICS intraday clearing. However, there was a significant decline in the number of transactions and batches concerned. In 2017, the number of batches and transactions concerned in the roll-overs declined to one half and one third, respectively, with a rolled-over value of HUF 31 billion. Six participants were concerned in the roll-overs. 90 percent of the roll-overs are caused by the same five participants – just like in the previous year. Also, similarly to the previous year, the underlying reason for roll-overs was not attributable to liquidity shortages but instead to liquidity management fault and wrong practices. 84 percent of the roll-overs are still roll-overs across one cycle, but unlike in the previous year, there were two occasions of roll-overs across three cycles – these latter cases account for 8 percent of all the cases and are related to one participant. During the current clearing in 10 cycles, roll-overs across two cycles do not yet lead to the violation of the so-called four-hour rule,[21] but during roll-overs across three cycles the four-hour rule is already violated. The banks concerned in the roll-overs held sufficient amounts of securities to pledge, so they could have easily provided the necessary liquidity. As they did not take this opportunity, the underlying reason may be liquidity management fault or wrong practice, which they probably have undertaken deliberately (Chart 40).

2.2.3.4 Clearing and settlement risk in KELER CSD

Similarly to the previous years, the clearing and settlement risk in KELER CSD continued to be low in 2017. One of the main underlying reasons is that settlement in central bank money and according to the DvP[22] principle accounted for the most part of its turnover. The settlement risk related to securities transactions is that during the transaction one of the parties concerned may not receive the securities or their cash countervalue due to the given party. There are various options to mitigate this risk. The risk of the failure to perform on the cash side is significantly reduced by settlement in central bank money. The underlying reason is that system participants that have a payment account with the central bank – the MNB in our case – may use the available central bank instruments designed for liquidity management, and these instruments most probably provide the funds necessary for the settlement of the cash leg of transactions. It is also a risk reducing factor if securities transactions are cleared and settled through a central counterparty. In these

Chart 40
Ratio of roll-overs to total roll-overs (2016 – left-hand chart; 2017 – right-hand chart)



[21] See: Glossary.

[22] Delivery versus payment (DvP) principle. The essence of the DvP (delivery versus payment) principle is that following the conclusion of the transaction the actual 'delivery', i.e. settlement is done only against payment. As settlement only takes place when it can be verified that the necessary security and its countervalue are available, the degree of the settlement risk is minimal.

cases the execution of the transactions is always guaranteed by the central counterparty. Nevertheless, clearing in line with the delivery versus payment (DvP) principle ensured by the central securities depository is also excellently suitable for eliminating the arising uncertainty factors. The reason for this is that payment between the transacting parties and the crediting of the securities do not take place until the cover necessary for performing the transaction becomes available. A good measure of the clearing and settlement risk potentially arising in connection with the execution of securities transactions may be the proportion represented by the aforementioned risk reducing factors in the case of the transactions. In 2017, of the above-mentioned methods, settlements in central bank money and/or in line with the DvP principle had the highest weight in the case of KELER CSD. In terms of the turnover value, the ratio of settlement in central bank money was 96.7 percent, while the share of DvP transactions was 68 percent.[23] These indicators roughly correspond to the values measured in 2016, and can still be considered high. At the same time, some decline was observed in the number and value of DvP transactions compared to the data of the previous year. The main underlying reason was that the number and value of repo transactions settled on the basis of the delivery versus payment principle[24] declined due to the low interest rate environment. In the low interest rate environment, borrowing in the interbank market was economically more rewarding for those concerned than financing with repo transactions. Nevertheless, the decline had no major impact on the safety of settlement.

Compared to 2016, a decline was observed both in the total value and number of free of payment (FoP[25]) securities transactions in 2017, which also pointed to a decrease in settlement risk. Instead of the delivery versus payment principle, securities transactions may also be settled as FoP transactions. In the case of FoP transactions, their cash and security legs are settled separately, i.e. technically KELER CSD receives only securities debiting or crediting instructions. This may entail a settlement risk because it is unknown when and how the cash side of the securities transaction will be settled. In 2017, FoP transactions in the case of KELER CSD accounted for 32 percent of the value of the turnover. It is to be noted, however, that although the securities transactions cleared through KELER CCP acting as central counterparty are technically also considered FoP transactions, their settlement is guaranteed by the central counterparty, i.e. in these cases there is no settlement risk. In 2017, the value of transactions cleared through KELER CCP amounted to 3.8 percent of the total value of FoP transactions, and thus risk could only arise in the case of the remaining part.

2.2.3.5 Clearing and settlement risk in KELER CCP

Compared to 2016, the total value of the spot capital market turnover cleared by KELER CCP increased, while a decline was observed in the derivative capital market turnover. Compared to previous years, the rate of expansion of markets cleared as general clearing member declined in 2017, although it is still considered significant. The related clearing and settlement risk changed proportionately to the turnover. KELER CCP clears the financial instruments traded at the Budapest Stock Exchange and MTS Hungary as central counterparty. Besides, it clears the domestic natural gas markets, and provides non-clearing member services as an energy market general clearing member for spot and futures electric energy, natural gas and emission quota products traded at ECC markets. In 2017, the total value of spot capital market transactions cleared by the central counterparty exceeded HUF 2900 billion, representing a 12.7 percent increase compared to the previous year. Compared to 2016, a 9.6 percent fall (equalling some HUF 250 billion) in the total annual turnover was seen in the case of derivative capital market transactions. In terms of the energy market non-clearing member service, compared to the previous year's nearly 75 percent expansion, the increase in the aggregate energy market turnover slowed down to 12.5 percent by 2017. In 2017, the rise in the energy market turnover was coupled with its structural modification as well. Expansion in the spot markets exceeded 66 percent. On the whole, turnover in the derivative market declined by nearly 29 percent, which was greatly attributable to a 39.7 percent fall in the electric energy market turnover. By contrast, natural gas market turnover grew by 206.7 percent. Overall, in parallel with the turnover of electricity markets, the importance of trading in natural gas products is also increasing in the ECC markets. Consequently, expansion in the turnover also means a growing settlement risk for KELER CCP (Chart 41).

[23] In KELER CSD, in addition to over-the-counter (OTC) transactions, which account for a major portion of the turnover, the settlement of fixed and auction transactions takes place according to the DvP principle.

[24] Repo or reverse repo transaction is an agreement on the transfer of the ownership right of a security with a repurchase obligation at a future date specified or to be specified at the time when the contract is concluded. The transactions take place at a pre-determined repurchase price irrespective of whether during the term of the transaction the buyer is free to dispose of the security that is the subject of the transaction (delivery repo transaction or hold-in-custody repo).

[25] Free of payment – see: Glossary.

Chart 41
The turnover of KELER CCP
(2015–2017)

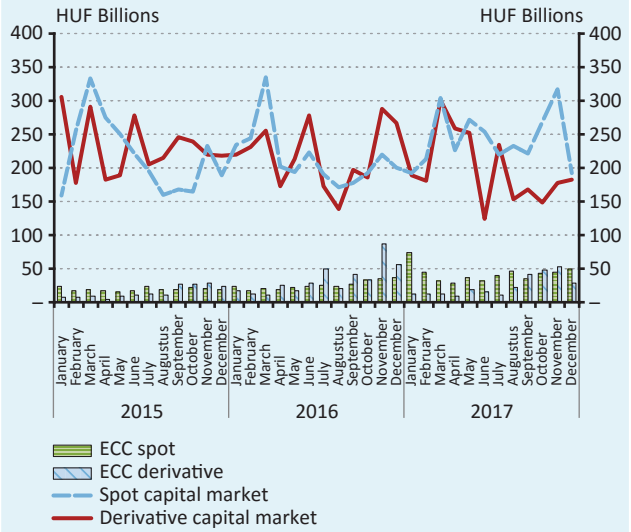


Chart 42
Open positions related to the cleared capital market, cleared gas market and energy market service for non-clearing members
(2015–2017)

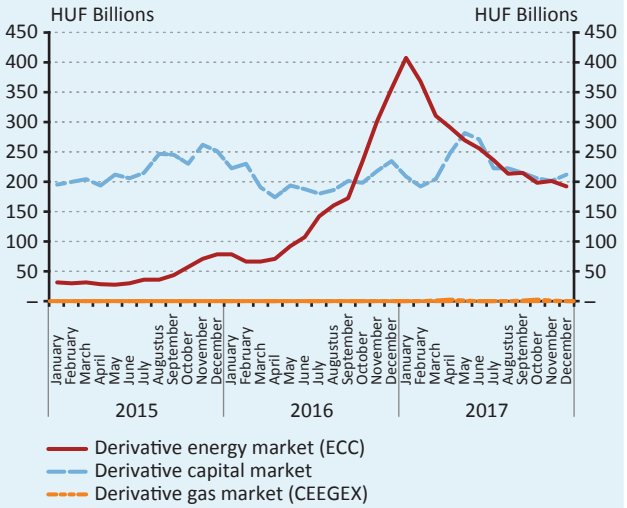
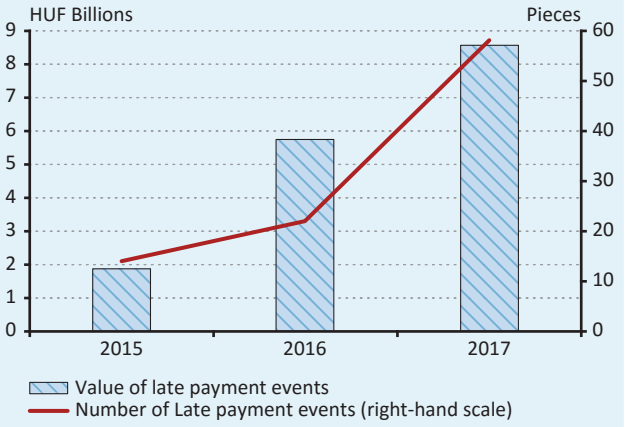


Chart 43
Number and value of late delivery events
(2015–2017)



At the beginning of 2017, the derivative market open positions arising in connection with KELER CCP's energy market service for non-clearing members were nearly twice as much as the derivative capital market open positions. This simultaneously shows the prominent role of the energy market service and the level of the clearing and settlement risk, which is much higher than before. In spite of the decline in the turnover of ECC-related derivative energy markets in 2017, which was, of course, followed by the degree of open positions as well during the year, it is remarkable that in 2017 Q1 the size of open positions significantly exceeded the open positions observed in the derivative capital market cleared by KELER CCP (Chart 42).

Compared to the previous years, the number and value of late delivery events grew significantly, but it did not result in any considerable increase in the settlement risk of KELER CCP. There is a delay in delivery when a clearing member or an energy market non-clearing member does not meet its obligation stemming from the clearing in time.[26] In 2017, KELER CCP recorded 58 cases like this in total; 44 and 14 of them were related to the capital market and the cleared energy markets, respectively. On the whole, compared to 2016, the number and value of late delivery events increased by two and a half times and one and a half times, respectively (Chart 43). Considering that in the case of a late delivery event the delivery does take place, but only later, as provided for in the rules of KELER CCP, the increase in magnitude did not make the central counterparty's risk much higher.

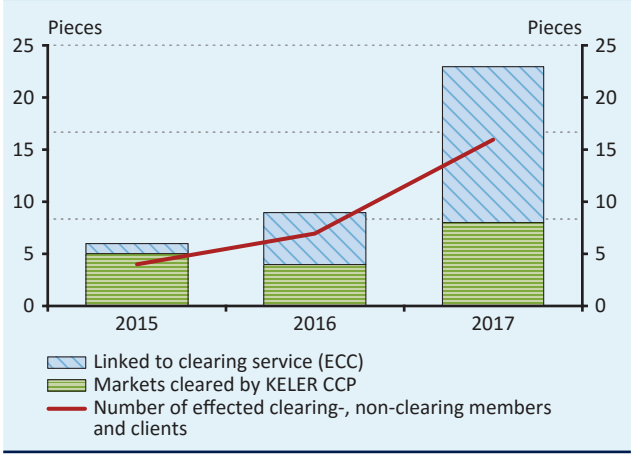
In the capital market, late delivery events occurred only on the securities side. All the 44 late delivery events in the capital market recorded by the central counterparty were on the securities side. In the vast majority of cases late delivery event occurred because the clearing member that had to deliver the securities was able to obtain the necessary securities through OTC trading with a delay, i.e. there was a kind of contagion effect. In the remaining 14 cases the late delivery event on the securities side was the result of the omission by a party participating in the clearing. In terms of overseeing it is reassuring that the late delivery event was not on the cash side or the collateral side

[26] As of 2018, the earlier term 'non-performance' may only be applied in the case of actual non-performances.

in any of the cases, i.e. the late delivery was not caused by clearing members' financial liquidity difficulties. At the same time we consider it risky that individual actors' late delivery took place as a result of exogenous factors on which KELER CCP has only a minimum impact.

Compared to the previous years, in 2017 KELER CCP had to impose more additional financial collateral, which indicates a rising risk level. KELER CCP imposes additional financial collateral if one of its clearing members, principals or energy market non-clearing members, for a reason imputable to it, violates the rules of the central counterparty in any way. In 2017, additional financial collateral was imposed on 23 occasions in total, whereas in the previous years the number of penalties typically did not reach even half of this figure. Nearly two thirds of the additional financial collateral imposed in 2017 was related to KELER CCP's energy market non-clearing member service (Chart 44).

Chart 44
Imposing of additional financial collateral and the number of parties concerned
(2015–2017)



KELER CCP attained an adequate result during the second ESMA stress test, which examined the resilience of 16 central counterparties in the European Union along various scenarios. The first stress test, which was conducted in 2015, was limited to the examination of credit risk factors, whereas the second stress test also comprises an analysis of liquidity risks. Firstly, the tests provide information on the concentration of the exposures of central counterparties and the interdependence of the individual institutions' relations, and secondly, under various conditions they measure the usability of guarantee funds and other collateral elements as well as the adequacy of the available liquid assets. The tests present that at system level central counterparties in the European Union resist extreme market shocks and clearing members' combined non-performance. The findings suggest that the risk management methods of KELER CCP can be considered adequate, and they sufficiently cover the risks under review.

2.2.4 LATEST DEVELOPMENTS RELATED TO THE KELER GROUP

2.2.4.1 Authorisation of KELER CSD according to the CSDR[27]

The authorisation of KELER CSD according to the CSDR started in September 2017. The effects of the 2008 economic crisis and the demand for creating a single European capital market made it necessary to set up a system of rules that facilitates the safe, efficient and smooth settlement of financial instruments within the Union and determines the uniform organisation and conduct of central securities depositories. As a result, the regulation on improving securities settlement in the European Union and on central securities depositories (CSDR) was adopted. It entered into force on 18 September 2014, and as it is a regulation, it is directly applicable in Hungary as well. The regulation concerns not only the central securities depositories, but also all actors that have a direct or indirect relationship with them. Through the regulation of the authorisation, supervision, organisational and operational requirements of central securities depositories as well as of their legal relations with other capital market participants, the objective of the CSDR is to contribute at EU level to the creation of a safer, more efficient and more transparent capital market than before. The most important provisions of the CSDR include uniform prudential rules in order to guarantee the safe functioning of securities depositories. With its provisions concerning settlement discipline it intends to ensure that payment service providers execute their transactions by the contractual settlement time. With the mandatory dematerialisation and immobilisation requirement the regulation takes an important step for the recording of all transferable securities on securities accounts.[28] Central securities depositories had to submit their application for authorisation to the competent

[27] 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.

[28] A dematerialised security is a sum of data containing the content elements of the security in an identifiable manner, created, recorded, forwarded and registered electronically, in line with the relevant provisions of law. A physical, but immobilised security is a typographically produced security whose total issued quantity is deposited in a central securities depository, from where its physical removal cannot be requested.

authorities within six months following the publication of the regulatory technical standards (RTS), which contain the detailed rules. KELER CSD, which is the only central securities depository in Hungary, submitted its application to the MNB on 29 September 2017. KELER CSD as a specialised credit institution needs a licence not only for its central securities depository services but also for its bank type services. The accreditation process is expected to be closed in 2018.

2.2.4.2 Meeting of the international authorisation college of KELER CCP

Cooperating with the international supervisory college of KELER CCP, the MNB discussed KELER CCP's 2017 activity, and established that it complied with the EMIR regulation. Since the initial 2014 authorisation, KELER CCP, which is an EMIR licenced central counterparty , has continuously been supervised by a college consisting of international members and chaired by the MNB. In 2017, in addition to the MNB and the ESMA, the Belgian, the Irish and the British supervisory authorities participated in the supervisory college. The Belgian and Irish ones because the credit institutions supervised by them represent a significant share in the guarantee funds of KELER CCP, while the British one because KELER CCP clears a trading venue supervised by the FCA. In November 2017, at its annual meeting the international supervisory college of KELER CCP discussed the most important events of the past one year, its authorised services as well as the short- and medium-term plans of KELER CCP. The main topics of the meeting included the clearing and guarantee undertaking of XTEND, a new spot market launched by the Budapest Stock Exchange to facilitate the stock exchange introduction of small and medium-sized enterprises, for which KELER CCP obtained an authorisation in 2017. It was discussed in a similar manner that the lookback period used in the risk management model in the CEEGEX spot gas market increased from 180 days to one year, which can already be considered adequate, and also concerning the CEEGEX spot and forward markets it was discussed that the euro became the clearing currency instead of the Hungarian forint. The college also discussed the change according to which, pursuant to the MiFID, the former CEEGEX forward market – as a result of its transfer to the HUDEX platform – will function as a regulated market in the future. Last, but not least, the authorisation college of the central counterparty also put great emphasis on the examination of KELER CCP's expansion in Romania, looking at two projects. The college issued a limited authorisation for one of them (the so-called BRM Forward), while in the case of the other project (the so-called BRM MTF) the launching of the clearing of the market was tied to meeting further criteria. The college confirmed that the operation of the central counterparty is in line with the requirements of the international regulation.

2.2.4.3 KELER CCP's new services

As of 2017 H2, KELER CCP has been clearing the transactions concluded in the new multilateral trading system called XTEND of the Budapest Stock Exchange as a central counterparty. The Budapest Stock Exchange launched its trading platform XTEND in 2017 H2 aiming at the easing of the public appearance of small and medium-sized enterprises that are suitable or can be made suitable for stock exchange introduction. Similarly to the BSE T category, which can be considered the predecessor of the XTEND market, the clearing of the trading venue is carried out by KELER CCP as central counterparty. Prior to starting the clearing activity, KELER CCP needed the approval of the change from the college consisting of international members that authorise KELER CCP and that did not consider the clearing of the new market as a significant change. At the same time it meant an approval for KELER CCP for launching and performing the clearing activity. The clearing of the new market does not mean any material change in the risk outlined by KELER CCP, which did not project any additional cost either in connection with the project. No security was introduced in this market until end-2017; consequently, there was no transaction either.

In the CEEGEX spot and forward markets, the euro became the trading and clearing currency, thus adding primarily to KELER CCP's financing risk and, related to that, its settlement risk. In line with its customers' demand, in 2017 CEEGEX switched over to trading and clearing in euro, which also affected the operation of KELER CCP, which clears the aforementioned markets. In spite of the fact that the authorisation college did not consider the change significant, making the previously forint-based clearing and guarantee undertaking euro-based resulted in a higher financing risk for KELER CCP, as in the case of a non-performance on the cash side, KELER CCP has to honour its obligations in euro. Considering that KELER CCP can offset its risk stemming from the euro-based clearing by hedging as well, it may also affect its capital adequacy level. In 2017, the turnover of the CEEGEX spot market was four times higher than the turnover value in 2016, while the turnover of the CEEGEX derivative market was more than 13.5 times higher than the 2016 turnover value.

The clearing of the forward natural gas trading of the HUDEX Hungarian Derivative Energy Exchange, which was launched in 2018, is carried out by KELER CCP, which does not mean any additional risk for the central counterparty.

As a result of the coming into force of MiFID II, as of 2018 the forward power and natural gas trading of the earlier HUPX and CEEGEX takes place through the platform of the HUDEX. The power trading of HUDEX is still cleared by the European Commodity Clearing (ECC), which is located in Germany, while forward gas products are cleared by KELER CCP. The forward power and forward gas are cleared separately, and thus there is no interoperability between the German and the Hungarian central counterparties, i.e. no additional risk arises for KELER CCP in this market. Even the authorisation college of KELER CCP did not classify the service provision in the new market segment as significant modification.

With the clearing of the gas markets of the Romanian Commodities Exchange new business opportunity may open up for KELER CCP. However, this entails an increase in its clearing, settlement and financing risks. KELER CCP signed a cooperation agreement with the Romanian Commodities Exchange (Bursa Romana de Marfuri – BRM). Accordingly, the gas markets of BRM are cleared by KELER CCP as central counterparty. This concerns two markets: the BRM Forward market and the BRM MTF market. Taking into account that the clearing of the BRM markets is considered a significant change, the authorisation college of KELER CCP had to conduct a procedure under Article 15 of the EMIR for both markets. The procedure was closed in the case of the BRM Forward at end-2017, and thus KELER CCP received authorisation for clearing the new market. The authorisation procedure for the BRM MTF is still going on. In the BRM Forward market, trading is in RON, and thus the clearing, the settlement and the guarantee system are all based on RON. During the authorisation of the BRM project, various sources of risk were identified, regarding which KELER CCP has to progress within a year, and has to indicate any problems that might arise to the competent authority.

2.2.5 COMPREHENSIVE OVERSIGHT ASSESSMENTS IN 2017

Based on the comprehensive oversight assessments, the operation of VIBER and the ICS was safe, reliable and efficient in the past 2 years, thereby supporting the operation of the domestic money and capital market and hence, strengthening financial stability. In 2017, comprehensive oversight assessments of domestic payment systems were prepared for the sixth time. The comprehensive assessments of VIBER and the ICS took place in line with international practices, on the basis of the Principles for Financial Market Infrastructures (PFMI), [29] which contain the requirements concerning financial market infrastructures. The questionnaire completed by system operators, the data and information collected during the continuous risk-based oversight (e.g. incident reports, overseer's opinions given upon the amendment of rules, overseer's notes) and interviews conducted after self-assessment served as basis of the assessments. According to the assessments, the operation and services of VIBER and the ICS were reliable and efficient, and no serious concerns were identified. In most cases, the assigned assessment ratings of the related 18 principles of the PFMI (e.g. governance, legal basis, risk management framework, operational risk, efficiency and effectiveness) were observed or broadly observed..[30] In the past two years, on the whole, system operators improved their compliance with the oversight requirements, and thus overseers upgraded the assessment rating of 3 principles in the case of VIBER, while upgrading the rating of 2 principles and downgrading the rating of one principle in the case of the ICS. In the context of the assessments, the MNB – as the overseer – prepared recommendations for the overseen systems aimed at the further improvement of operational reliability and efficiency, as it can see possibilities of development in the case of both systems. Based on the recommendations, systems operators have drawn up action plans and their implementation has started. The comprehensive oversight assessment of KELER CCP started in 2017; the evaluation of data and information as well as the verification of compliance with the principles are going on.

2.2.6 COOPERATIVE OVERSIGHT OF THE CLS, T2S AND THE ISSUANCE OF THE LEI CODE

The MNB has participated in the cooperative oversight of the CLS, since the introduction of the forint into the CLS settlement mechanism, i.e. since November 2015. The central banks of the currencies settled in CLS[31] participate in the cooperative oversight of CLS. Because the CLS

[29] The PFMI were issued by the Bank for International Settlements (Committee on Payment and Settlement Systems, whose name has changed since then to Committee on Payments and Market Infrastructures (CPMI)) and the Technical Committee of the International Organization of Securities Commissions (OICU-IOSCO) in April 2012.

[30] Assessments are based on a scale of four ratings; accordingly, based on the verification of compliance with specific principles, the subject can be qualified as observed, broadly observed, partly observed or not observed. Certain topics are not relevant to some of the systems; those cases were not rated.

[31] The central banks of the 18 currencies involved in CLS settlement, and of them, the European Central Bank and 4 European central banks concerning the euro.

incorporated in the USA, the Federal Reserve Bank of New York (FED) act as the lead overseer. MNB participates at expert and senior-level in the oversight committee meetings. The committee reviews and discusses the design and operation of CLS, the strategic and major issues relating to CLS . They review the assessments prepared by the CLS supervisors as well. The committee has the opportunity to meet regularly with the representatives of CLS. The oversight committee review the proposals of any material changes in rules, procedures or operation to identify any issues or concerns that could materially affect the CLS and gives its consent on the basis of the observance of the PFMI and the given country's relevant legal and regulatory provisions.

The MNB has participated in the cooperative oversight of the system since February 2017, when KELER CSD joined the TARGET2-Securities (T2S) securities settlement platform. The oversight and supervision of the T2S platform performed in international cooperation take place with the participation of the central banks and supervisory authorities of the countries concerned as well as the European Securities and Markets Authority,[32] under the direction of the European Central Bank. The objective of the cooperation is that the participating authorities use uniform assessment criteria to examine the compliance of the T2S infrastructure with the oversight principles, and that securities depositories continue to meet the requirements of the relevant legal and regulatory framework following their accession as well. The cooperative tasks related to the T2S are coordinated by an institutional system consisting of the Plenary Body, working groups and the Secretariat. The main tasks to be performed during the cooperative oversight can be summarised as follows:

- Discussions within the framework of regular meetings, regarding, inter alia, compliance with the PFMI, as well as conducting analyses and assessments.
- Exchange of information concerning the central securities depository between the T2S and other participating authorities.
- Participation in initiating and elaborating consistent recommendations and regulatory changes coordinated on the level of those concerned.

One of the most important tasks in 2018 will be the comprehensive examination of the T2S system according to the PFMI principles. As part of that, the MNB will prepare its evaluation regarding two principles: rules and procedures concerning participants' non-performance and relations between financial market infrastructures.

The MNB participates in the cooperative oversight of the GLEIF (Global LEI Foundation) that operates and formulates the framework of LEI code (Legal Entity Identifier) issuances, that is a unique identification code for legal entities worldwide. KELER provides its LEI code issuing service pursuant to its agreement with the independent German LEI code issuer (WM Datenservice), but based on the decision taken on 19 March 2018 by the GLEIF (Global LEI Foundation), the organisation carrying out the centralised licensing and recording of LEI code issuing organisations, KELER CSD may pursue its activity as an independent LEI code issuer. The operation of the GLEIF, and thus of the global LEI issuing system, is overseen by the so-called Regulatory Oversight Committee (ROC), which consists of some 71 authorities with full membership rights and 19 observers; the MNB is also a member of the ROC. The basic document of the oversight is the cooperation agreement signed by the ROC and the GLEIF in October 2015. Through the ROC, the MNB is primarily the global LEI issuing system's standard creating body, also overseeing and supervising their observance, and mainly participating in the maintenance of the principles concerning the control system of the global LEI code issuing system and in the oversight of the system as a whole.

[32] European Securities and Markets Authority (ESMA)

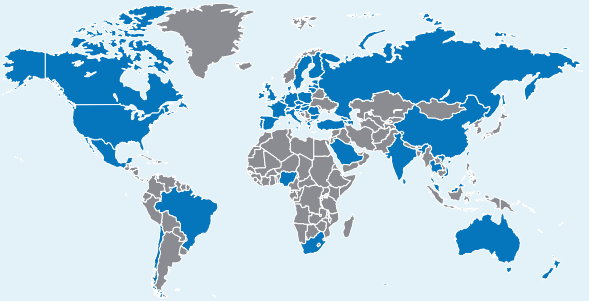
3 Introduction of the instant payment system

In order to maintain the competitiveness of the financial sector, the new instant payment service will be available in Hungary as well starting from July 2019. In the past years, instant payment service or its introduction started in the majority of countries that have developed electronic payment systems.

Box 3
Instant payment systems worldwide

Instant payment has either been introduced or is under development in almost all the economically important countries in the world that have developed payments market (Chart 45). Due to the advantages attainable through instant payment – especially the feature that it is able to offer an electronic alternative to cash payments in almost any situation – the introduction of systems like this is a global trend. Therefore, it is essential for the preservation of the international competitiveness of the Hungarian economy as well that the domestic payment system also be able to keep up with international development.

Chart 45
Planned or already functioning instant payment systems in the world



Planned or already functioning instant payment systems in the world

Source: MNB, own compilation.

Central banks undertake a determining role in initiating and coordinating the introduction in many countries. Looking at countries outside Europe, central banks have been acting as catalysts, for example, in Australia, Brazil, South Africa, South Korea, the United States, India, Japan, Canada, China, Mexico, Switzerland, Saudi Arabia, Singapore and Turkey. In other countries the involvement of the central bank is more limited. In India, for example, it only operates the systems that perform central bank settlement. Another important aspect is the activity of market participants. In Sweden, for example, moderate involvement was adequate, as the demand for development arose on the market participants' side. Central banks may support the introduction of instant payments by expanding the capacity of central bank systems as well as by the extension of their business hours, for which the Mexican system may serve as an example.

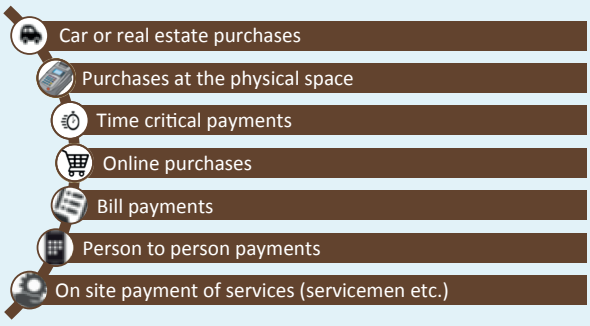
In Europe, the introduction of instant payment was followed by positive experiences in several countries, and as a result of the ECB's activity, this service is expected to be available in the majority of the countries on the continent within a few years. The already introduced European systems, for example in England, Denmark or Sweden, show a favourable picture of the transformation of the payment system. Typically, it was not the card payment turnover that became rechannelled into the new mode of payment, but the number of cash payments, which are more expensive for the society and are less efficient, declined. At the same time, as a result of market players' developments, the initial money sending function between persons was followed within a short time by the introduction of payment solutions that can be applied in other payment situations, e.g. in the case of retail purchases. Firstly, the ECB introduced a single rule book for the harmonisation of business processes at European level, and secondly, through the development of the infrastructure,[33] it also makes a cheaply operating instant payment system available for payment service providers and eventually for consumers in the countries of the euro area.

[33] TIPS: TARGET Instant Payment Settlement: https://www.ecb.europa.eu/paym/intro/news/articles_2017/html/201706_article_tips.en.html

3.1 Development of market services and pricing issues

Payment solutions created on the basis of the instant payment system allow electronic payment in any payment situation (Chart 46). Instant payment has all the favourable characteristics that in certain payment situations are only typical of cash payment now. Accordingly, with the instant payment service, simultaneously with the economic event (e.g. a purchase) its financial transaction may take place as well in a way that the beneficiary may use the received amount for further payments immediately. The paying party may also receive immediate feedback about the outcome of the payment transaction, and thus can determine whether the transaction was successful. The use of instant payment will not require any new means of payment on the customers' side, because with the use of the widespread smartphones it will be possible to initiate payment practically in any payment situation. For the use of the instant payment service it is sufficient to have a payment account with any domestic payment service provider, which is also available for the majority of households and all companies.

Chart 46
Possible application situations of instant payment



The creation of payment services relying upon the instant payment system is the task of market participants; the operator of the central infrastructure will not provide services to retail and corporate clients directly. The basic and additional services of the central system provide various opportunities for market participants for the creation of innovative services, but market participants have to create these services themselves or in cooperation with one another. The MNB's definite expectation is that the instant payment services should be created in a way that they should be interoperable with one another, i.e. in the case of using a service it should be possible to reach at least the basic functions of the instant payment service for the customers of another service as well. In a shopping situation, for example, it should be possible to use payment solutions relying on instant payment even if the buyer and the merchant are the customers of different payment service providers, and there is no direct agreement between the service providers regarding the cooperation between their services.

Instant payment also allows the modernising of payment solutions related to the public sector; therefore, the institutions concerned need to pay attention to mapping these possibilities. In line with the Government's strategic objectives concerning the digital changeover, creating the possibilities of electronic payment and encouraging their use are also necessary in the payment transactions related to the state. Firstly, it allows the increasing of the operational efficiency of the sector, and secondly, it may contribute to achieving the strategic targets approved by the Government to develop households' financial literacy. With the instant payment service it may become possible to use modern, innovative payment solutions in many state-related payment situations, including tax payment, the payment of various service fees or payment for utility services. By this, the services of the public sector can be modernised, and their digitalisation may be accelerated. Public actors either independently or cooperating with one another or with market players may be able to create new payment solutions tailored to their own needs. For this it is necessary that in 2018 the institutions that have some kind of payment turnover with their customers assess on their own side the operational processes of performing their services and the related payments, and examine the ways of using instant payment services in such cases. In order to facilitate this, a working group was set up within the project, and cooperating with public institutions this group makes proposals for the creation and utilisation of new payment solutions.

The use of open data entry solutions is indispensable for the interoperability of services. In order to create basic-level interoperability, the regulation concerning instant payment services stipulates that only open data

entry solutions may be used for the launching of instant payments. There are two ways for market participants to comply with this provision. Firstly, they may jointly standardise certain data entry solutions, whose standards will be freely available and usable for anyone, and secondly, they may also use their own unique data entry solutions. In this case, however, their technical documentation has to be made public in a sufficiently detailed manner that enables other market players as well to interpret and utilise the data produced by using the documentation for initiating payments. For the creation of common standards at least in the case of the most frequent data entry solutions, the MNB initiated the setting up of a working group within the framework of the project. During its work, this working group will identify the most frequently used data entry solutions for which it is expedient to create the common standards, and it will also make proposals for the standards. The final versions of the standards will be available for market participants in 2018 H2, and thus they will be able to use these standards during the development of their own services as well.

In addition to the open data entry solutions, the MNB will make public the proposals elaborated by market participants concerning the basic payment processes of the most frequent payment situations. The working group that deals with the interoperability of payment services explores in the most frequent payment situations the processes along which the instant payment services may be implemented in the most efficient way, and the MNB will make the process descriptions prepared for these basic-level processes available for everyone. Its purpose is that the participants in transactions face basically similar payment processes at least in the most frequent payment situations, and thus it should be simpler for them to learn the operation of the new payment solutions. In addition, the basic-level process descriptions may provide significant support for the developers of the services as well. Namely, they can select the ones that are most appropriate for them from many processes that have already been worked out, and they do not need to elaborate them independently. This may significantly accelerate the development of new services, and may facilitate the spreading of their use on the customers' side. It is important to take into account that it is not mandatory to use the proposals regarding the basic processes of the main payment situations. In addition to them, any further payment process – that complies with the relevant legislation and the rule books of the central system – can be used, but with the application of the common basic processes as well it is possible to create divergent, unique services, as they do not limit market participants' opportunities to provide services.

The MNB expects market participants to encourage the use of instant payment services also with their pricing. One of the fundamental conditions is that in parallel with the introduction of the innovative service, payment costs borne by customers should not increase in any case. In addition, however, the pricing of the instant payment should have a structure that makes the modern payment services competitive compared to the already available electronic payment solutions and the use of cash. Accordingly, when formulating the pricing it should be taken into account that divergent services may evolve with the instant payment, and it will be possible to use them in any payment situation. Consequently, a new pricing structure is also needed for encouraging the use of the new types of payment functions. It is not justified in any case to price the new services similarly to the present credit transfer services. For the pricing, partly due to the same utilisation possibilities, it is primarily expedient to take the fee structure used at present in the case of payment cards as a basis.

3.2 The instant payment brand and the provision of information concerning instant payment

The introduction of the brand concerning the instant payment service may significantly contribute to the spreading of the new payment service. The analysis related to the introduction of the instant payment is being prepared, and the final decision on the introduction is expected for 2018 H1. The purpose of preparing the proposal is to examine the possible solutions that arise regarding the introduction of the instant payment brand and, as a result, to contribute to taking the decision which of these alternatives will be implemented in the case of the instant payment service in Hungary.

The objective by creating the instant payment brand is to provide a definite picture and impression of the instant payment service for the users of the instant payment or for those who encounter it. For this it is necessary that the instant payment brand fulfil the role that it identifies the payment service, distinguishes it from other payment services, means quality guarantee for users, contributes to the standardisation of the basic service, and expresses the individual characteristics that are typical of the instant payment. The instant payment brand should define the uniform communication elements regarding the service level covered by the brand, the set of rules that describe the operation of the service level as well as the uniform appearance towards those concerned in connection with the brand.

The functioning of the instant payment brand also includes the harmonised communication of the service to customers. The successful introduction of the payment brand can be attained with cooperation between market participants, on uniform grounds. As a result of the uniform communication it will be possible to make a distinction between instant payment and other services. What is needed for this is that the operation of the instant payment service should be clear for customers in terms of the rules that concern them. Accordingly, depending on what service level the new payment brand covers exactly, the communication related to the service has to be harmonised by the stakeholders concerned by the spreading of the service.

The payment brand covering the basic instant payment service contributes to the spreading of instant payments and facilitates the appearance of innovative payment solutions relying upon the basic service. The most important requirement related to the payment brand is to make the basic services known by a wide circle of customers that use or potentially use the payment service. It is also important that the payment brand should intervene in the development of the additional services only to the minimum extent necessary. This provides ample room for competition and the spreading of innovation in this field. The application of a strategy like this contributes to the development of many new additional service brands. It is also possible to look after and maintain the basic set of rules within the framework of the payment brand. Although not necessarily parts of the payment brand but – as recommendations – the descriptions of data entry standards and basic payment processes that ensure the standardisation of payment services may be connected to it; these descriptions are elaborated by the stakeholders in cooperation with one another or individually.

Payment service providers already now as well have to devote special attention to providing information to retail and corporate customers in order to make the instant payment service known as well as to encourage its intensive use and thus the spreading of electronic payment transactions. Payment service providers have to start preparing corporate customers and making the new service known already during 2018, as there may be tasks arising that require the rethinking of the processes and the preparing of the systems of service providers in connection with the introduction of the new instant service. In addition, it may also happen that the development of new, additional services related to the instant payment system opens up further possibilities for service providers and their introduction requires adjustment, performance of tasks, as well as modifications of systems and processes. Starting from the beginning of 2019, the provision of information to retail customers also has to be made intensive in order to let them know about the main features of the service by the time of its launching, allowing them to learn the use of the related payment services in various payment situations, for the spreading of electronic payment transactions and thus for increasing the efficiency of payment system.

3.3 The instant payment model and the main elements of its regulation

The payment model elaborated within the framework of the instant payment project is in line with European operational rules, but at the same time it contains various domestic specialities that facilitate innovation. An important condition of the introduction of the domestic instant payment system was met by the fact that GIRO made the operational rules elaborated together with the MNB and other market participants public.[34] The Hungarian rules, the flow of messages based on them and the operational processes are greatly in line with the harmonised European instant payment rule book.[35] The stricter, five-second execution time limit instead of the ten-second one can be considered the most important difference, which is an additional challenge for payment service providers, but is of key importance in terms of the applicability of the instant payment service. In addition, the rule books of additional services (secondary account identifier and request to pay) have also been prepared during the project. The publication of the rule books, in turn, may be of important help for the developers of domestic innovation and the additional services relying upon the instant payment infrastructure.

The new MNB Decree on execution of payment transactions announced in December 2017 already contains the detailed implementation rules of instant credit transfer and the related additional services that will enter into force on 1 July 2019. The legislative process followed the pre-determined schedule; with the participation of the Ministry for National Economy, the Ministry of Justice and GIRO Zrt. the regulatory concept was prepared by October 2017. It was discussed with the representatives of the payments sector, and the open consultation of the draft text also took place in November. The legislation was finalised and promulgated at the scheduled date after taking into account the proposals that had been received during the external consultation and had been considered justified.

The legislation specifies instant credit transfer as an independent payment mode subtype, exactly defining which payment orders belong here. Instant credit transfer are individual forint credit transfer orders up to a value limit of HUF 10 million that do not require manual processing, are debited of a forint payment account and do not contain a debiting date, provided that – with the exception of consumer customers – the orders are not submitted in batches by the payer. The currency in which the payment account of the payee is held does not matter in terms of the classification of the credit transfer as instant credit transfer, as this type of payment order can also be submitted to the credit of a payment account held in foreign exchange. In addition, based on the legislation, the payment service provider may also submit credit transfers that do not qualify as instant credit transfer (e.g. transfers with a debiting date following the day of submitting, disintegrated corporate batch orders, credit transfers exceeding the HUF 10 million value limit) to the instant payment system, although in the case of such payment orders it does not have to comply with the provisions of the MNB Decree on execution of payment transactions related to instant credit transfer.

The time available for the payer's payment service provider to perform the instant credit transfer is not more than 5 seconds from the receipt of the payment order. The instant credit transfer has to be considered received when both of the following two conditions are met: the payment order has arrived at the payment service provider, and authentication has taken place. Following receipt, the payer' payment service provider has to credit the amount of the payment transaction to the payee's payment service provider within not more than 5 seconds, and if the payer's and the payee's account servicing payment service provider is the same, the payment service provider has to ensure the payee's right of disposal over the amount of the payment transaction within 5 seconds at the latest. The execution time limit of not more than 5 seconds practically means that within this time the payer's payment service provider has to carry out the verification of cover, eliminate payment orders where money laundering or other fradulent practices are suspected, disintegrate the batches submitted

[34] https://www.giro.hu/kozlemenyek-/publikusan-is-elerhetove-valtak-az-azonnali-fizetesi-rendszer-szabalykonyvei/?token=c1f88fa498e270d8af52395b7f93c879cfe6eeab45c8fa21663d07325cc35893

[35] SEPA Instant Credit Transfer Rulebook: https://www.europeanpaymentscouncil.eu/document-library/rulebooks/2017-sepa-instant-credit-transfer-rulebook

by consumers and, if the payee's payment account is held with another payment service provider, forward the instant credit transfer to the instant payment system in a way that the settlement within the system should also take place within the 5 seconds.

In the case of instant credit transfer, immediate crediting to the payee's payment account may even take place without the simultaneous actual booking of the amount of the payment transaction by the payment service provider by crediting it on its own account. A precondition of this is that the payee's payment service provider should ensure the meeting of the three requirements determined in the MNB Decree on execution of payment transactions in another way. Namely, following crediting to its own account, i.e. when settlement has taken place in the instant payment system, it has to assign a value date to the amount of the payment transaction immediately, and make it available for the payee without delay in a way that allows the payee to have complete disposal of this amount at once. In addition, the payee's claim against the payment service provider has to be increased by the amount of the payment transaction immediately and irrevocably. It means that under certain conditions it is sufficient to provide for the crediting of the amount in a front end system; booking in the main accounting system can be done later as well with retrospective value date.

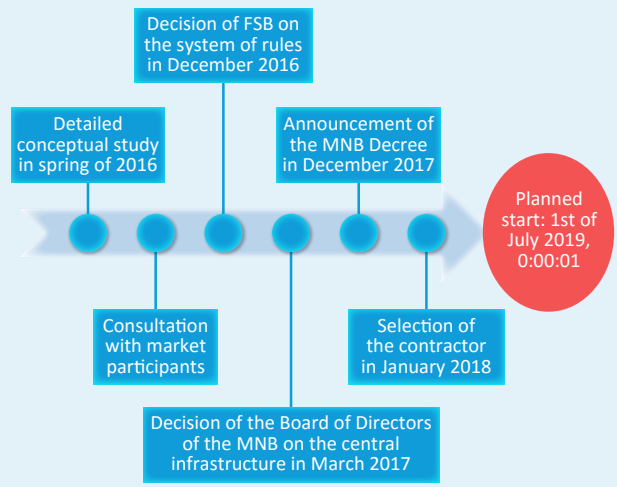
The regulation also allows the use of the payee's secondary account identifier upon giving the instant credit transfer instead of the payee's name and payment account number. Upon the start of the instant payment system the payment service provider has to allow the party entitled to have disposal of the payment account to assign a mobile phone number within the EEA, email address as well as domestic tax identification code or tax number as secondary account identifier to the payment account. Assigning secondary account identifiers to the payment account as well as their modification or cancellation are only possible through the account servicing payment service provider, which is obliged to make sure that the account owner is really entitled to initiate such action related to the secondary account identifier. For the revision of the validity of secondary account identifiers, the payment service provider has to initiate annual data reconciliation with the account owner, and if it is not successful, the secondary account identifier becomes void and is deleted from the central database.

In connection with the request to pay easing the launching of the instant credit transfer, the MNB's express expectation is that payment service providers develop and provide these types of services for those of their customers whose economic activity justifies it (e.g. merchants, utility companies, other household service providers). The payee may submit the request to pay with a maximum validity of two months to its account servicing payment service provider. However, within this period the validity may be set freely. The regulation does not forbid the payer to modify or complete certain data that are indicated in the received request to pay and are necessary for giving the instant credit transfer; allowing this depends on the decision of the payee that submits the request to pay.

3.4 Development of the central infrastructure and the main services of the system

The central infrastructure is being developed as scheduled, and thus the instant payment service will be available in Hungary as of July 2019 (Chart 47). In 2017, GIRO Zrt., which operates the central system, identified with the MNB's participation the most important expectations related to the functioning of the central system, based on which the list of requirements necessary for the procurement of the system was prepared. The supplier of the central system was selected on the basis of these criteria in January 2018. The system developed by the Danish Nets A/S meets the expectations related to the functioning and operating of the Hungarian instant payment service in every aspect, and is able to ensure the continuous, real-time processing of credit transfers at the expected level. In addition, it is also able to meet the requirements related to the additional services to be implemented in the central system, thus allowing market participants to provide modern payment services through the domestic financial infrastructure. Setting up the central infrastructure started as the joint effort of the system supplier and GIRO in early 2018.

Chart 47
Milestones of the introduction of instant payment to date



In line with the expectations, the central system of instant payment will be available and completely functional in the autumn of 2018, allowing the starting of tests to be carried out together with payment service providers until the summer of 2019. The finalisation of details related to the operation of the system started in early 2018. Within that, the operation of the system will be completely adjusted by the supplier to the domestic requirements and statutory provisions. In parallel with that, providing information to market participants about the exact operation of the system also started. Accordingly, the detailed definitions of the messages of the payment and additional services, technical information related to connection and the expanded versions of the rule books describing the business processes became available in the spring of 2018. In this work, there is intensive cooperation between GIRO and market participants, and detailed information related to business and IT processes, liquidity management as well as security solutions and testing are shared, and market players' questions are answered regularly in the working groups organised within the framework of the project.

The additional services of the central system operated by GIRO significantly support the creation of innovative payment solutions on the market participants' side. The central system continuously processes basic-level instant credit transfers 24 hours a day, on every day of the year in real time. This ensures that a credit transfer is carried out between the customers participating in a transaction within maximum five seconds. Already the continuous, real-time operation itself may widen the utilisation possibilities of electronic payments, while the additional services of the basic system allow the creation of a wide range of innovative services. With the use of the secondary account identifier database it becomes possible for customers to launch payments to phone numbers, email addresses, tax numbers or similar identifiers, without using account numbers. By using the request to pay, through the instant payment system it is possible to send messages with which the beneficiary of a payment may send the transaction data to the paying party, and based on them, the paying party may launch the payment just by approving the credit transfer, without giving the data again. The central system processes these messages with a speed and availability similar to those of credit transfers. In addition to the above, the central system will also comprise a message sending network where, in addition to financial messages, it will be possible to forward various other types of messages related to market participants' services (e.g. electronic invoicing information). While the secondary account identifier database is accessible only for payment service providers in order to safeguard the security of personal data, requests to pay and the communication network may be used by other institutions as well.

3.5 The liquidity framework of instant payments

The management of the forint liquidity provision related to instant payments will take place in a newly created, automated framework, for the use of which system participants have to prepare themselves. The participants of the instant payment system will have to provide the forint liquidity to cover their instant payments on the system's collecting account maintained by the MNB. The system will work in a prefinanced manner, i.e. on the collecting account each system member will set aside an amount that, according to its calculations, is sufficient for the smooth execution of its instant payment transactions. It will be the system members' responsibility to dedicate, on the basis of their own experiences and payment forecasts, an adequate amount of forint liquidity to the system. It is important that liquidity provision will basically be possible only during the opening hours of VIBER, which keeps records of the collecting account, i.e. between 7:00 and 18:00 hours on working days. Accordingly, prior to night periods and weekends, a system member has to set aside a sufficiently high forint amount that will provide adequate liquidity coverage until the next opening of VIBER. At the same time, in addition to the liquidity provided by the system members themselves, they may also expect a financing effect of payments received from other system participants, and thus it could be sufficient to cover only their net turnover.

In view of the importance of providing coverage, an automatic liquidity management function will support the participants of the instant payment system, allowing them to set minimum and maximum values concerning their own forint holdings dedicated to the system. If, as a result of the incoming and outgoing instant payments, the system participant's forint liquidity declines to below the minimum value or rises above the maximum value, the system will initiate automatic incoming and outgoing transfers, respectively, restoring the level of liquidity to the value determined by the system participant. Accordingly, following the proper setting of the threshold values, the system itself will perform the liquidity management instead of the system members, which at the same time means that the modification of threshold values will provide the technical possibility of obtaining and withdrawing liquidity extraordinarily. Irrespective of the automated operation, determining the value of liquidity planned to be kept in the system will remain the system participant's responsibility, so it is extremely important that the system participant has appropriate forecast concerning its own instant payment turnover.

When defining the relationship between the instant payment system and the central bank instruments, the MNB strives to ensure the availability of instruments that help liquidity management also for the provision of the forint liquidity of instant payment transactions. When planning the infrastructural cooperation between the instant payment system and VIBER, the central bank takes into account the monetary policy framework as well, with special regard to the interest rate conditions of the liquidity dedicated to the instant payment system, system members' reserve requirements and the applicability of central bank credit facilities. The MNB's objective in connection with this is that the infrastructural conditions contribute to the abundance of liquidity set aside for the instant system as best as they can, while the framework of the current monetary policy also stays effective. In the case of the interest rate conditions of the dedicated liquidity this means that the ensuring of neutrality is prioritised when determining the interest rate to be applied, i.e. the conditions of the collecting account should not be less favourable than the conditions of other central bank instruments provided for the system participants. Also related to the principle of neutrality are the ideas that institutions subject to reserve requirements should be allowed to include their liquidity set aside for the instant payment system in their statutory reserves and that the central bank credit line available during the business hours of VIBER should be usable in the instant payment system outside VIBER business hours as well. In addition to the prefinanced forint liquidity, this latter function would allow system members' credit lines determined on the basis of securities collateral to also constitute coverage for instant payments, which could make the liquidity management of the period outside VIBER business hours even safer.

With its available means the MNB will support the liquidity management of the instant payment system. Nevertheless, upon developing the additional functions, it always takes into account its basic expectations formulated in connection with the instant payment system. The MNB is open to make available for the participants of the instant

payment system its liquidity increasing credit facility provided against eligible collateral, i.e. the intraday credit line, even in the periods not covered today, i.e. outside the business hours of VIBER, which are between 7:00 and 18:00 hours on working days. The related development would allow system participants to take into account during their night and weekend liquidity management not only their money in account but also the collateral value of their securities pledged to the central bank. At the same time, the MNB intends to provide this possibility only for managing extraordinary liquidity situations, as it views prefinancing with money in account the primary method. All this is corroborated by the fact that according to the MNB's analyses, system-level forint liquidity is ample even without securities collateral, and thus the functioning of the instant payment system can be ensured at all times. Accordingly, supporting system-participants' liquidity management by the central bank may only arise as an additional option and it is an expectation that the use of the related new functions should not result in an unjustified increase in end-user fees.

4 Medium-term strategic directions of payments

4.1 Financial infrastructure development strategy

In connection with the introduction of the instant payment service planned for 1 July 2019, the future role of the currently operating payment systems also has to be reviewed in terms of the efficiency of the payment infrastructure. The new system to be introduced in 2019 may result in major changes in the turnover of the other settlement platforms as well. In this respect the economies of scale of the payments market is important, i.e. it is expedient to operate as few infrastructure elements in parallel as possible. At present, a significant portion of low-value payments is processed in the overnight and intraday systems operated by GIRO, which clear interbank credit transfers and direct debits. Therefore, due to cost effectiveness and the up-to-date characteristics of the new instant payment system, in the case of low-value payments it is necessary to examine how it is possible in the medium term to divert as much of the total low-value transfer and direct debit turnover as possible to the instant infrastructure. Namely, not only the credit transfers subject to the instant execution obligation, but also the entire retail interbank turnover may theoretically be implemented in the new system, including the high-volume transactions related to the Hungarian State Treasury. Accordingly, it may become possible to terminate the systems that have processed these payment transactions to date, and this may increase the efficiency of payment transactions both on the central infrastructures' and payment service providers' sides.

In 2018, the MNB is preparing a detailed strategy about the possibilities of diverting low-value payments onto the instant payment infrastructure. In the case of the instant payment system it will have to be examined to what extent the new platform is able to actually support the processing of the turnover of all types of modes of payment. Namely, it is possible to tell whether it is feasible to divert the transactions of the other platforms to the new system only when the functions and features of the system that can already be considered final are known. In addition, if the instant system technically allows it, it is also necessary to analyse whether the diverting of the transaction turnover from other platforms is really a cost effective solution or due to the necessary additional developments no savings can be attained in terms of operating costs. It is also a primary aspect in the case of a potential reorganisation or consolidation of certain elements of infrastructure that no decline in service quality and in the reliable operation of the systems should be perceptible for consumers. With the involvement of GIRO Zrt., the MNB is preparing a detailed payments infrastructure strategy on the basis of the above aspects in 2018 H2.

The forint turnover settled by CLS can increase further if several of the 43 non-participating CLS Settlement Members decide to use the services of the system for their forint transactions as well. The Hungarian forint became a settlement currency in the CLS system on 16 November 2015, thus the banking sector can rely on the risk management services rendered by CLS for more than two years already. The system provides protection for the parties to FX transactions against the risk arising from the counterparty's potential default, and it also makes liquidity management related to the settlement of FX transactions more efficient. There is a fair chance of the appearance of new participants in 2018 as well, in view of the fact that the Hungarian banking sector can already exhibit two years of stable operation and several reliable local partners. In parallel with all this, the MNB maintains constant professional relations with CLS decision-makers, which also includes joint efforts for the further improvement of the conditions of forint settlement. Based on the foregoing, the central bank trusts that the range of the system's users will further broaden in 2018 as well, and thereby it will be possible to manage an increasing volume of forint turnover free from FX settlement risk.

The implementation of the harmonisation tasks stemming from the Hungarian market's joining the T2S is going on; within that, a comprehensive development concept is being elaborated in order to reform the handling of domestic corporate actions. Since KELER CSD's joining on 6 February 2017, the Hungarian securities market is available in the TARGET2-Securities system, which allows pan-European

securities settlement. A precondition of the appropriate use of the system is that the markets that join it should harmonise their operations in terms of the legal and technical aspects of securities settlement. One of the focal points of the harmonisation is the standardisation of the handling of corporate actions, as there are major differences across Europe in this respect: the infrastructural arrangement of corporate actions (e.g. dividend payment) is based on the local legal environment and market practice, and, accordingly, there may be many local specialities in the fields of taxation and technical implementation. In order to comply with European standards, the operators of the domestic securities infrastructure, the BSE, KELER CSD and the MNB, are planning to implement a comprehensive development concept, as a result of which the domestic processes will conform to the uniform international practice already in the near future.

4.2 Virtual currencies and analysis of the concept of digital central bank money

The MNB continuously monitors the role of virtual currencies in the payment system, although no major increase in turnover is expected in this field at present. In the past years, various virtual currencies appeared at international level; they function independently of the current financial system, typically use the blockchain technology and operate without a central issuing institution. The role of these new types of currencies in payments is limited. Nevertheless, in cooperation with other state institutions and following the international trends, the MNB continuously examines whether it is necessary to regulate the functioning of virtual currencies, and if yes, in which manner.

Virtual currencies in their present form are unable to reform payments. Virtual currencies in their present form are unable to fulfil the main functions of money, such as measure of value or store of value, as their supply typically does not conform to the needs of the real economy, and their exchange rate is also extremely volatile. Due to lack of a central institution and legal regulation, they carry significant risks in terms of consumer protection as well. At the same time, in terms of payment innovations a new concept also arose in the past years, whose spreading could mean fundamental changes in the operation of the financial intermediary system.

The introduction of digital central bank money is a complex issue that may greatly affect not only payments, but also the functioning of various other central bank areas and the entire financial intermediary system. Theoretically, the technological development of recent years also makes the introduction of widely available digital central bank money issued by the central bank possible. Central bank money in electronic form is already available for the financial institutions that have an account with the central bank, but the concept of digital central bank money aims at the introduction of central bank money that is widely available for consumers as well, similarly to cash. Technologically it is feasible through the expansion of the traditional account management systems, within which the central bank would maintain accounts for consumers and businesses, but it is also conceivable with the application of the blockchain technology, which serves as the basis for the functioning of virtual currencies. At the same time, the eventual introduction of digital central bank money would have a significant impact not only on payments, but, for example, on financial institutions' deposit collecting and lending abilities as well; therefore, in-depth analyses are necessary for the consideration of advantages and risks.

Similarly to other central banks and in line with international trends, the MNB is examining the possible advantages and risks related to the introduction of digital central bank money. Recently many central banks, including those of England, Denmark, Sweden, the USA as well as the European Central Bank have started to deal with the possibility of introducing digital central bank money. These analyses cover not only the technology to be applied, but also the activities of various central bank areas (payments, monetary policy, financial stability) and the effect on the economy. However, as the digital central bank money would presumably change the operation of the economy and the financial sector completely, neither the aforementioned institutions nor the MNB plan any concrete steps regarding the introduction.

4.3 Financial Literacy Development Strategy

The Financial Literacy Development Strategy adopted by the Government in December 2017 formulated various objectives that facilitate the use of electronic payment solutions. Acquiring adequate financial knowledge is indispensable for taking conscious and reasonable financial decisions. The analyses prepared by the MNB pointed out that by letting consumers know about the characteristics and ways of operation of modern payment solutions the use of electronic payment solutions may be made more intensive. Emphasising these solutions contributes to increasing the efficiency of the payment system, results in savings for the society, and contributes to the further whitening of the economy. Therefore, the Financial Literacy Development Strategy adopted by the Government set, inter alia, a number of targets that encourage the usage of electronic payment solutions. These targets include the increasing of the acceptance of electronic payments, the supporting of the installation of POS terminals, the gradual electronification of payments to and by the state, the stimulation of transferring monetary remunerations to payment accounts as well as giving preference to electronic payment solutions in the private sector. The MNB helps the achievement of all these targets with its available analytical and regulatory means, in its role as a catalyst it provides support to the implementation of the instant payment infrastructure on schedule and to the presentation of the new service to customers.

5 Current issues of the transposition of the new Payment Services Directive

The new Payment Services Directive entered into force on 13 January 2018. The most important rules complementing the new Payment Services Directive include the regulatory technical standards on secure communication and strong customer authentication (strong customer authentication RTS). The rules of the strong customer authentication RTS will apply in Hungary as of 1 January 2019. In the transitional period between the two dates, payment service providers have to comply with certain provisions concerning the security of payments in different ways.

5.1 Rules valid in the transitional period

Certain rules of the new Payment Services Directive will only be applicable when the strong customer authentication RTS that complement the Directive enter into force. The technological advancements of this century and changing consumer habits tend to revolutionise the financial system. Therefore, payment services are subject to significant transformation. The new Payment Services Directive took the next step for innovation, the improving of competitiveness and the transparency of the pan-European payment market as well as for increasing the security of payments through the Internet and of access to payment accounts. European central banks, including the MNB, actively participated in elaborating the rules complementing the new Payment Services Directive, of which the most important are the strong customer authentication RTS. The rules of the strong customer authentication RTS will apply in Hungary as of 1 January 2019. Accordingly, they will enter into force some 5 months earlier in Hungary than in the other Member States of the European Union.

In the transitional period between the entry into force of the regulation transposing the new Payment Services Directive into Hungarian legislation and the entry into force of the strong customer authentication RTS, payment service providers have to comply with certain provisions concerning the security of payments in different ways. The main innovation of the regulation is that with the observance of strict security rules it allows customers to employ innovative, so-called third-party service providers, which provide payment initiation or account information services. The majority of transitional rules are also related to them. In the transitional period, account servicing payment service providers are not yet obliged to have an interface suitable for safe communication. Therefore, third-party service providers also do not have to identify themselves and communicate through a safe channel with the payment service provider that maintains a payment account for their customer. It means that in the transitional period payment service providers can still use the screen scraping process to have access to payment accounts.

5.2 Security rules

As of 1 January 2019, payment service providers will have to comply with all provisions concerning secure communication and customer authentication. The strong customer authentication RTS contain strict security rules for ensuring the secure execution of electronic payment transactions as well as for the avoidance of phishing and fraud. One of the most important security provisions is the mandatory application of the so-called strong customer authentication, the aim of which is to reliably identify the customer by using the authenticity of at least two unrelated authenticating elements. For example, such unrelated elements may be the user's password and a token made available for the user. This authentication solution provides efficient protection, because losing or knowledge of one of them does not affect the other. However, the application of strong customer authentication may be omitted in certain cases, such as credit transfers between payment accounts owned by the same person, the use of unattended terminals used for transport fare and parking fees as well as low-value payment transactions.

5.3 Liability rules

In cases when the account servicing payment service provider executes a payment order that has not been authorised by the customer, it has to compensate the customer for its loss the latest until the working day following notification. The new liability rules are much stricter in terms of the payment service provider's liability. As opposed to the previous provisions, in the vast majority of losses, due to the requirement of paying compensation on the working day following notification by the customer, account servicing payment service providers are not really in a position to investigate the circumstances of the given case of loss. The only exception from complying with this provision is when the payer's payment service provider has reasonable grounds for suspecting fraud. In this case, following reporting to the MNB, it may investigate the matter.

The special rules relating to payment instruments (e.g. bank card, Internet banking or telebank) create an even more favourable situation for consumers and micro-enterprise customers. If the loss was caused to the customer by using payment instruments (e.g. his stolen bank card was used), the aggrieved party will bear the loss that arose prior to its reporting in an amount of up to HUF 15 thousand, instead of the earlier maximum HUF 45 thousand. However, if the payment service provider does not require strong customer authentication or the customer could not notice the unauthorised use, the total loss will be borne by his payment service provider. The payment service provider is exempt from the liability for damages if it can prove that its customer breached its commitments fraudulently, deliberately or by gross negligence, e.g. by keeping the PIN code next to the card or by saving his Internet banking user name and password in his mobile phone.

In the transitional period the liability related to employing third-party service providers lies with the customer. As in the transitional period payment service providers are not yet obliged to establish a connection for secure communication, payment initiation or account information service providers provide their services as they do it now. As a result, however, if the customer uses a third-party service provider, it discloses its authentication data to a third person other than his account servicing payment service provider or himself. Therefore, if the customer suffers losses during the use of payment initiation or account information services, he will have to bear the loss. Following the transitional period, already the general rules concerning the bearing of losses will apply.

5.4 Authorisation

In order to ensure the prudent operation of third-party service providers, payment initiation and account information services became activities supervised by the MNB. As of 13 January 2018, the new types of services became activities subject to notification and authorisation. In the case of service providers that are engaged only in payment initiation, a precondition of the authorisation, inter alia, is the existence of an initial capital of at least HUF 15 million. Both payment initiation and account information service providers must have professional liability insurance or similar guarantee to be able to comply with their liability for damages following a case of damage, if any. Following the successful obtaining of the authorisation and the successful notification, the MNB continuously supervises the institutions that provide these services, thus ensuring their prudent operations.

5.5 Other changes

The immediate crediting obligation of payment transactions has also been extended to payment accounts held in currencies of non-EEA member states. It means that following the crediting on its own account, the payee's payment service provider immediately has to make available the amount of the payment transaction – with a value date – for the payee irrespective of the currency of the payment account. An exception is if conversion between the currencies is needed, and at least one of the currencies is the currency of a non-EEA member state (e.g. USD/HUF conversion).

Payment service providers must not charge any fee or other cost for disabling a payment instrument (e.g. bank card or Internet banking) if the disabling may prevent a possible case of damage. The customer has to immediately report to his account servicing payment service provider if he notices that the payment instrument is not in his possession any longer, or if it was stolen or used in an unauthorised manner or without approval. Following the reporting, the payment service provider must not execute any payment transaction with the given payment instrument. In addition, the payment service provider that maintains the customer's account may reserve the right to disable its customer's payment instrument in the event of a suspicion of the given payment instrument's unauthorised or fraudulent use, or for the safety of the cashless payment instrument. The payment service provider must not charge any fee or cost for the disabling following the customer's reporting or for the disabling initiated by the payment service provider in the case of consumers and micro-enterprise customers.

Glossary

4-hour rule	Pursuant to MNB Decree No. 15/2010 (X. 12.), starting from 1 July 2012 the payment service provider of the payer must assure that Hungarian forint credit transfers generated by customers electronically within the time period specified for same-day execution (i.e. before the final submission time) are received by the payment service provider of the payee within 4 hours of acceptance.
Acquirer (payment card)	The payment service provider with whom the merchant accepting payment for purchases by payment card enters into an agreement to execute transactions. In the course of the clearing and settlement of transactions the acquirer collects and forwards to the merchant the value of card transactions.
Act on Payment Service Providers	Act CCXXXV of 2013 on certain payment service providers.
Additional financial collateral	Surplus collateral required by KELER CCP from clearing members and power market non-clearing members for guaranteed capital market, gas market and power market transactions.
ATM (Automated Teller Machine)	Automated Teller Machine, through which cash withdrawals as well as other transactions (e.g. credit transfers) can be executed using payment cards.
Batch processing	Simultaneous collective processing of items received at different points in time which are put in the same group if specific features are identical.
BÉTa	Multilateral trading facility (MTF) operated by the BSE as a platform for trading foreign stocks in Hungarian forints. The stocks purchased in the BÉTa market are identical to the stocks listed on foreign stock exchanges.
Blue chips	The most liquid and most traded stocks in a market.
BSE	Budapest Stock Exchange Ltd.
Capital position limit	Quantity of the open derivative positions which a clearing member or client may have as a percentage of equity. At KELER CCP the position limits are calculated by dividing the initial margin requirement calculated by KELER CCP by the equity.
CEEGEX	Central Eastern European Gas Exchange.
Central counterparty	The central actor that interposes itself between the counterparties and guarantees the settlement of the transaction even when one of the parties fails to fulfil its obligations.
Central securities depository	Its main responsibility is the safekeeping of printed (physical) securities, the registration of immobilised or dematerialised securities (existing in the form of electronic signals) and the registration of the owners of securities by main account. Central securities depositories operate securities settlement systems, in which securities transactions are settled by book entries (that is, without physical movement of the securities).

CGF	Collective Guarantee Fund
Chip migration	The equipping of payment cards bearing only a magnetic strip with chips, and simultaneously the enabling of devices handling payment cards to accept chip cards.
CIFE Act	Act CCXXXVII of 2013 on Credit Institutions and Financial Enterprises.
Clearing	The acceptance, formal and substantive verification of orders followed by the calculation of the bilateral or multilateral liabilities of clearing members. Liabilities may be calculated on a gross or net basis.
Clearing and settlement risk	A delay or failure of clearing or settlement in the payment or securities clearing system, despite the fact that the clearing or settlement service is uninterrupted. The term 'clearing and settlement risk' is justified by the separation of the two phases (clearing and settlement) in some systems. Depending on the structure of the system, the realisation of clearing risk does not necessarily result in the failure of settlement and settlement risk may occur even if the clearing phase goes smoothly. Clearing and settlement risk may arise from the insufficient liquidity, insolvency or operational problems of participants.
Clearing house	The entity performing the processing, clearing and, in the absence of a settlement agent, settlement of transactions.
CLS Continuous Linked Settlement.	A clearing and settlement model facilitating the elimination of FX settlement risk relying on a multi-currency PvP mechanism. The CLS is operated by the CLS Bank.
Collective guarantee fund	Collateral required by net clearing systems, which is part of the guarantee system and can be used if any of the members of the risk community fail to fulfil their obligations. Its purpose is to reduce losses arising from transaction settlement fails and delays through a jointly owned guarantee fund.
CSDR	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.
Customer payments	Payment orders generated by the customers of system participants.
Decree on basic payment accounts	Government Decree No. 262/2016 (VIII. 31.) on access to basic payment accounts and the features of and charges payable for basic payment accounts.
Decree on Payment Account Switching	Government Decree No. 263/2016 (VIII. 31.) on payment account switching.
Designated system	The payment and settlement system which the Magyar Nemzeti Bank as the designating authority designates as being covered by the SFA as well as a system operated by the Magyar Nemzeti Bank pursuant to the provisions of the SFA.
Designating authority	The Magyar Nemzeti Bank pursuant to the SFA.

Direct submitter	A customer who has an agreement with the clearing house exclusively for the direct submission to the clearing house of payment orders relating to its own financial management, pursuant to the authorisation of a direct participant and under a clearing arrangement with such participant, who is not considered a participant in the payment system.
DvD	Delivery versus Delivery. The exchange of securities to securities, which means that the instrument to be exchanged is credited and debited to the parties' accounts simultaneously. Based on the English abbreviation, these transactions are referred to as '…'.
DvP	Delivery versus Payment. The settlement method which links the cash and securities legs of orders for the settlement of securities transactions; it assures that the securities leg settlement occurs only after the cash leg settlement has been completed, or conversely, the cash leg settlement occurs only if the securities are available and settlement is assured.
EBAEBPP	European Banking Authority Electronic Bill Presentment and Payment
ECC	European Commodity Clearing AG, a Leipzig-based clearing house acting as a central counterparty mainly for clearing in the energy market.
EEA member state	Member State of the European Union or another state party to the Agreement on the European Economic Area
Eligible collateral	The scope of collateral that the MNB accepts as cover for the secured credit transactions it enters into (including intraday credit lines). The types of eligible collateral are listed in the 'Terms and Conditions of the Bank's Operations in Hungarian Forint and Foreign Exchange Markets'.
EMIR	Regulation (EU) No. 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories.
ESMA	European Securities and Markets Authority
EuroMTS	A multilateral trading platform mainly for secondary market trading in government bonds, where government bond series in excess of EUR 5 billion issued by most European countries are traded.
Execution	**See: settlement.**
FGS	Funding for Growth Scheme.
FoP (Free of Payment)	A transaction that does not involve any payment at the time of the settlement of a securities transaction.
GIRO	Giro Clearing House Ltd.
Gridlock	Gridlocks may emerge if orders submitted by one or several participants in the payment or securities clearing system are not settled due to the lack of funds or securities. As a result, the orders of numerous other participants remain unsettled.

Gross clearing — A clearing mechanism whereby only entirely funded transactions are cleared.

Guarantee callable on first demand — For transactions guaranteed by KELER CCP, in addition to the protection offered by the individual and collective guarantee elements, KELER CSD also provides a guarantee to KELER CCP up to a certain percentage of its capital. If during the management of default procedures KELER CCP needs to resort to the guarantee callable on first demand in addition to the use of individual and collective guarantee elements, KELER CSD is obliged to make available to KELER CCP funds up to the amount of the guarantee callable on first demand.

ICS — Interbank Clearing System, a deferred time gross clearing system operated by GIRO, offering two types of clearing: overnight clearing and, since 2 July 2012, intraday clearing.

Individual guarantee elements — Collateral required by net clearing systems, which are part of the guarantee system and can be used only if the clearing member providing the security fails to settle (in the case of KELER CCP: basic financial collateral, variation margin, initial margin, additional financial collateral, liquidity FX security deposit).

Information asymmetry — A (decision) situation where one of the parties to a transaction has more, or more accurate, information than the other party. This upsets the balance of power between the parties and in the worst case scenario may lead to market failure.

Integrated cooperative banks — Cooperative banks signing the "agreement on the integration of cooperative banks". They participate in the payment and settlement systems indirectly, through Magyar Takarékszövetkezeti Bank Zrt. as their correspondent bank and they execute their payment transactions through the correspondent bank.

Interchange fee — A fee calculated as a proportion of the purchase price and paid by the acquiring payment service provider to the issuer in respect of purchases made with payment cards.

Interchange Fee Regulation — Regulation (EU) 2015/751 of the European Parliament and of the Council on interchange fees for card-based payment transactions.

Interoperability — Interoperability means technical (e.g. standards) and business solutions that support the execution of payment transactions between the participants of the payment solution even in those cases where participants are members of two different payment systems or participants of services provided within the same system. In other words, the execution of payments cannot be hindered by business or technical obstacles that would necessitate membership in more than one system for the execution of the payment transactions.

Intraday credit line — Given sufficient collateral, the settlement agent (mostly the central bank) provides intraday credit lines to system participants to facilitate the prompt execution of the payment orders cleared in the system. The scope of eligible collateral is determined by the settlement agent. The credit line and the current account balance of participants together comprise the liquidity available as collateral for payment orders.

Issuer (payment card)	The payment service provider that makes the payment card available to the cardholder and in the course of the settlement of transactions, forwards the value of the transactions to merchants through acquirers.
KELER CCP	KELER KSZF Központi Szerződő Fél Zrt. (KELER KSZF Central Counterparty Ltd.)
KELER CSD	Központi Elszámolóház és Értéktár Zrt. (Central Clearing House and Depository Ltd.)
KID system	A system that ensures electronic communication between KELER and its clients.
LEI	Legal Entity Identifier, which enables the unambiguous and unique identification of actors in financial markets, making it possible to identify not only parties to financial transactions but also their affiliated companies and company groups, thereby facilitating without limitation the assessment of the risk of financial contagion as well as the combating of money laundering and terrorism.
Liquidity	The totality of financial instruments that can be used to settle orders in payment and settlement systems.
Liquidity bound	The upper bound of liquidity indicates the amount of liquidity required in the payment system for the settlement of items without queuing or delays, whereas the lower bound of liquidity indicates the lowest value of systemic liquidity where items, although with delays, will be settled by the end of the day concerned.
MICL	Maximum Utilisation of the Intraday Credit Line. An indicator calculated for the usage of the central bank's intraday credit line which shows the maximum percentage used on a given business day for the settlement of orders.
MiFID, MiFIR	Markets in Financial Instruments Directive and Regulation.
MNB	Magyar Nemzeti Bank
MNB Decree on payment transactions	MNB Decree 35/2017 (XII. 14.) on executing payments
MTF	Multilateral (alternative) Trading Facility.
MTS	The multilateral trading facility operated by EuroMTS.
Net clearing	In the process of netting, the conversion of the payables and receivables of clearing members vis-à-vis one another into a single payable or receivable by deducting the receivables from the payables. Netting may be bilateral or multilateral. The next step is the settlement of the net debit positions thus calculated. In case of insufficient funds, the guarantee system of net clearing must be activated.
New Payment Services Directive	Directive (EU) 2015/2366 of the European Parliament and of the Council on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No. 1093/2010, and repealing Directive 2007/64/EC.
NFKP	Daily Natural Gas and Capacity Trading Market.

OTC	Over the Counter market (including MTF and OTF platforms).
OTF	Organised Trading Facility.
Participant	An entity entitled to send orders to the payment or securities clearing system in its own name or on behalf of its customer. Participants can be direct or indirect, depending on whether they are connected on their own or through another participant.
Payment account	An account held in the name of one or more customers of a payment service provider which is used for the execution of payment transactions, including bank accounts.
Payment Accounts Directive (PAD)	Directive 2014/92/EU of the European Parliament and of the Council on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features.
Payment service provider	A credit institution, institution issuing electronic money, institution operating the Postal Clearing Centre, payment institution, the MNB and the Treasury offering payment services.
Payment Services Act	Act LXXXV of 2009 on the Pursuit of the Business of Payment Services.
Payment Services Directive	Directive 2007/64/EC on payment services in the internal market.
Payment system	In the case of the overseen systems, the form of cooperation based on an agreement between cooperating parties to run the system specified in Section 6(1)27) of the Act on Credit Institutions. It is a part of the financial infrastructure, including the different payment instruments, bank procedures as well as interbank payment systems, which in combination facilitate the execution of payments.
PFMI Principles for Financial Market Infrastructures.	A publication issued in 2012 by BIS and IOSCO setting out 24 principles that provide uniform foundations for and thereby harmonise the requirements for financial market infrastructures in order to ensure that they are robust and resilient to shocks.
POS terminal	Devices facilitating the execution of payments by payment card (occasionally also the withdrawal of cash) in merchant locations. Information relating to the transactions is collected in electronic or paper formats; the former is the electronic POS (EFTPOS: Electronic Funds Transfer POS), the latter the imprinter.
Post-trading infrastructure	The group of institutions performing clearing and settlement functions after the conclusion of a transaction.
Potential liquidity	From the perspective of payment systems, potential liquidity is the sum of the account balance of the VIBER participant's 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.
PSD	See: Payment Services Directive.
PSD2	See: new Payment Services Directive.

PvP	Payment versus Payment. Simultaneous execution of interbank and customers payment orders of two participants in a payment system, which assures that they are settled when and only when the other party has sufficient funds for the settlement and both orders can be settled.
Queue management	A central procedure whereby the system does not reject temporarily uncovered orders in the payment or securities clearing system; instead, they are put in a queue, then processed automatically when sufficient funds are available.
Risk of service continuity	The disruption or downtime of the clearing or settlement service in the payment or securities settlement system. This is generally attributable to some operational irregularity at the service provider or it may arise from its financing or commercial problems.
Screen scraping procedure SecuRe Pay Forum	A procedure, with the help of which, using its customer's authentication data, the payment initiation or account servicing service provider itself enters the customer's Internet bank, and provides its service through that.European Forum on the Security of Retail Payments. A Forum established in 2011 at the initiative of the European Central Bank on the security of retail payments.
SCT	SEPA transfer
SDD	SEPA collection
SEPA	Single Euro Payments Area
SEPA End Date Regulation	Regulation (EU) No 260/2012 establishing technical and business requirements for credit transfers and direct debits in euro and amending Regulation (EC) No 924/2009
Settlement	Execution of payment and securities delivery obligations between system participants. Settlement occurs through accounting records on the accounts kept at the entity functioning as settlement agent.
Settlement agent	An organisation that maintains the settlement accounts of the entities participating in the payment and securities settlement system and the account of the central counterparty, ensuring the settlement of orders. If necessary, it grants credit to an entity or the central counterparty for the purpose of facilitating settlement.
SFA	Act XXIII of 2003 on Settlement Finality in Payment and Securities Settlement Systems.
Social cost	It includes the entire resource requirement of the payment chain; that is, the expenditures of all the participants in the payment chain excluding the fees paid by the parties to each other within the chain.
Strong customer authentication	A procedure when the authentication of the customer's identity is based on the examination of the authenticity of at least two so-called authentication data, falling into two categories out of possession, knowledge and inherence (typical feature of the customer). The category of possession covers, for example, an instrument suitable for issuing a one-time password or a chip card. Knowledge includes, for example, the password, while inherence covers a fingerprint or an iris scan.

Strong customer authentication RTS	Commission Delegated Regulation (EU) 2018/389 of 27 November 2017 supplementing Directive (EU) 2015/2366 of the European Parliament and of the Council with regard to regulatory technical standards for strong customer authentication and common and secure open standards of communication
System operational interdependency risk	It may arise if the various interdependent steps in the clearing and settlement process are performed by different service providers. The mostly liquidity related interdependencies of systems may give rise to contagion.
T2S (TARGET2-Securities)	Pan-European settlement infrastructure for the settlement of transactions in European securities markets.
TEA	Exchange Settlement Fund
Third party, external service provider	A party not directly involved in the process of clearing and settlement. Mostly performs communication services, supply of software and hardware, other support or outsourced services.
Trading	The mutual contractual agreement between trading members with the purpose of the sale and purchase of financial instruments. Settlement may be through physical delivery or cash settlement.
Trading Platform	A special online platform supporting the daily balancing of participating natural gas systems and the settlement of the end-of-day imbalances of the gas day, where systems operators and Trading Platform members may conclude, through a central counterparty, natural gas and capacity trades as required for the efficient management of their trading portfolio or for the execution of their daily balancing tasks based on the principle of anonymity between seller and buyer, in the form of standardised transactions.
VIBER	Real time gross settlement system. A payment system primarily for the purpose of settling large-value and time critical transactions. Clearing and settlement occurs in real time, upon the verification of cover (gross settlement), in a single step. If in the course of the processing immediately following the submission of the transaction there are sufficient funds available, the order is executed finally and irrevocably.

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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