MAGYAR NEMZETI BANK

PAYMENT SYSTEMS REPORT

2016

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

King Louis I. ('The Great')

PAYMENT SYSTEMS
REPORT

2016

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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. One of the main responsibilities of the Magyar Nemzeti Bank (MNB) as set forth in the Act on the Magyar Nemzeti Bank is to promote the smooth execution of payments and to facilitate the reliable and efficient functioning of the payment and settlement systems. The sound and smooth functioning of payments and the payment and settlement systems are essential for the execution of real economic 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 payment and settlement systems, 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 payment and settlement systems 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 Director Lajos Bartha. The Report was approved for publication by the Financial Stability Board at its meeting on 24 May 2016. Contributors: Patrik Gergely Balla, Dániel Béres, László Bodnár, Judit Brosch, Éva Divéki (editor), Miklós Fenyvesi, Gábor József Harkácsi, Bence Illés, Tamás Ilyés, László Kajdi, Miklós Luspay (Head of Department), Milán Mészárovics, Beáta Kovács-Papp, Cecília Pintér (chief editor), Kristóf Takács, Lóránt Varga (Head of Department).

The key messages of the study as well as the Report were discussed and valuable advice on the finalisation of the document was provided at the meetings of the Financial Stability Board on 8 March 2016 and 24 May 2016, and at the Monetary Council meeting on 10 May 2016.

The MNB staff relied primarily on information relevant to 2015, although in a forward-looking manner the Report also analyses the ongoing developments observed in the course of 2016.

Contents

Key messages

The use of electronic payment methods continued to grow in 2015, with significant progress achieved in the area of contactless card technology.

The number of credit transfer and direct debit transactions continued to increase at a similar pace as in recent years, rising by 2–3 per cent, but payment card purchases proved to be the fastest growing payment method. This process was boosted by the spreading of contactless cards and compatible payment terminals, which provided consumers with an electronic alternative for quick, convenient payments even in the case of retail transactions. In payment card turnover, online (primarily e-commerce) card-not-present transactions demonstrated the most dynamic growth, although they still comprise only a small part of total card transactions.

In 2015, the efficiency of Hungarian payment system increased considerably by international standards.

All three indicators measuring the level of development of credit transfers, electronic purchases and electronic bill payments increased in 2015. The share of electronic payment methods in retail purchases rose by 2.6 percentage points, thanks to the sharp, 20 per cent increase in the annual turnover of payment card purchases. As a result of the dynamic growth in payment card turnover in recent years, the indicator has improved by 5.7 percentage points since 2012, representing a 50 per cent increase. There was a robust, 8 percentage point increase in the share of electronic bill payments in the past year. Owing to the positive developments, one third of utility bills and other service charges are now paid electronically.

Doubling the number of intraday clearing cycles in the Interbank Clearing System (ICS) operated by GIRO Zrt. and extending the operating hours from September 2015 accelerated domestic payment transactions further, to a degree that was also perceivable by customers.

From the autumn of 2015, the number of intraday clearing cycles in the ICS rose from five to ten, which means that credit transfers are now cleared in the system in hourly cycles. As a result, the amounts transferred are credited to beneficiaries' accounts faster than ever. As expected, owing to the higher cycle frequency, the number and value of transactions cleared in individual cycles have essentially halved, which facilitated a more even distribution of intraday transaction turnover. Although the first cycle now starts an hour earlier, the highest number of transactions is still processed in this cycle, as it is responsible for clearing all (typically household) credit transfers initiated after the end of the previous business day. The extension of the operating hours of the ICS by half an hour in the afternoon primarily benefits corporations, leaving more time to execute their payment transactions. The introduction of the ten cycles and hence the more evenly distributed transaction turnover, reduced potential clearing and settlement risks, as ICS members need less liquidity to settle their positions.

As of 1 January 2016, all credit transfers denominated in HUF submitted on paper to credit institutions for interbank clearing are processed in the intraday clearing system of the ICS.

From the beginning of 2016, not only electronic, but also paper-based credit transfers must be submitted to the intraday clearing system. Thus, in addition to the credit transfers of the Hungarian State Treasury, at present, only debit transactions are cleared in the overnight system. The medium-term objective of the MNB is to ensure that all payment transactions are processed in the more state of art system, instead of overnight clearing.

On 16 November 2015, the Hungarian forint was included in the CLS system as a settlement currency, whereby the forint became the first currency in the region to join the leading financial infrastructure of the international foreign exchange market.

The inclusion of the forint in the CLS system was preceded by two years of intensive preparations and development work on the part of both the MNB and Hungarian foreign exchange market participants. The use of CLS may significantly reduce the probability of situations where – as in September 2008 – international foreign currency financing becomes inaccessible for Hungarian banks. Therefore, the MNB made it clear that it expects the banking sector to use the system actively. Turnover settled in CLS has been on the rise since the inclusion of the forint and the MNB expects further growth for 2016.

As in previous years, the operation of the overseen financial market infrastructures was highly reliable in 2015, supporting the functioning of money and capital markets safely and efficiently.

Developments implemented in domestic financial market infrastructures in 2015 improved the efficiency of the systems without any undesired increase in operational risks. The availability of VIBER (the Hungarian RTGS) and the ICS improved compared to the previous year, but deteriorated slightly in the case of KELER and KELER CCP. In respect of transactions processed in the payment systems, in 2015 the clearing and settlement execution time shortened compared to 2014.

Participants of the systems adjusted quickly and adequately to the effects exerted by the modification of monetary policy instruments and by the MNB's Self-Financing Programme on the liquidity of financial market infrastructures.

There was sufficient liquidity in the financial market infrastructures for the smooth execution of payments both at system level and on an individual bank basis. The liquidity of system members was shaped by several events in 2015. However, thanks to adjustments in member-level liquidity management, this did not increase the level of clearing and settlement risks. As a result of the MNB's Self-Financing Programme and the modification of monetary policy instruments, participants raised the aggregate level of pledged collateral, including the liquidity available for payment transactions (intraday credit line). With respect to collateral, the share of government bonds exhibited the most marked increase in 2015, growing to 72 per cent after a 24 percentage point expansion. On the whole, the participants of day-to-day liquidity management used the available intraday credit lines more actively, taking advantage of the credit for longer periods and to a somewhat greater degree than before, which partly reflects the effect of the fixed, 2 per cent reserve requirement applicable to all members as of 1 December. As a result of the measure, the current account balance of participants decreased on average; consequently, they needed to rely on their intraday credit lines more strongly for the smooth execution of payments.

In the first half of 2015, the risk management framework of KELER CCP successfully averted the spill-over of the defaults of brokerage firms subjected to supervisory measures to the rest of the capital market participants.

In the wake of the broker defaults at the beginning of the year, defaults in the markets cleared by KELER CCP rose both in terms of number and aggregate value compared to 2014. Thanks to the prudent risk management rules of KELER CCP, the defaults did not spill over to other market participants. At the same time, KELER CCP did not sustain any losses in managing the series of defaults. Likewise, despite the insolvency of certain capital market participants, clearing and settlement risks did not arise across the infrastructure.

Clearing and settlement risks in the markets cleared by KELER CCP were not exacerbated even by the shorter settlement deadline of domestic and foreign securities traded on the Budapest Stock Exchange.

In line with European securities markets, pursuant to the rule adopted on 6 October 2014, spot securities transactions conducted on the Budapest Stock Exchange must be settled no later than the second business day (T+2) following the trading day, instead of the previously stipulated third business day (T+3). After analysing the data of the nine months preceding and following the adoption of the new rule, it was found that the change expedited the settlement of securities transactions, while the reduction of the period available for settling the transactions – as expected – had no major impact on the number and value of defaults.

According to the regulatory inspections conducted in 2015, institutions providing payment services essentially complied with regulations; however, the MNB called for measures and imposed fines on a number of occasions with respect to the violations detected.

In general, the payment inspections conducted in 2015 found that, despite being essentially compliant, all inspected credit institutions had committed violations to various degrees. Inspections conducted at 22 institutions found violations of regulations in 176 cases. Key violations involved failure to provide information, inadequate rectification of payment transactions and inappropriate liability and loss allocation. In consideration of the severity of the violations identified, the MNB imposed fines on 8 credit institution amounting to a total of HUF 90.3 million.

Regulatory changes affecting domestic payment transactions and financial market infrastructures are intended to enhance modern payment services and to ensure safer access to the services concerned.

The Payment Accounts Directive announced in 2014 is to be transposed into Hungarian law by the autumn of 2016. As a result, the pricing of retail payment services will become more transparent and comparable, customers will have easier access to basic and low-cost payment services, and account switching between service providers will become simpler. Moreover, a new Payment Services Directive was announced in January 2016, which is to be transposed into Hungarian law within two years.

By 31 October 2016, payment service providers operating in Hungary and their customers must comply with the requirements of the EU regulation applicable to credit transfers and direct debits in euro.

From that date, credit transfers and direct debits in euro must be executed in accordance with the common standards and technical requirements of the regulation commonly referred to as the “SEPA End Date Regulation”. The preparation of Hungarian participants is progressing at an adequate pace; at the end of 2015, nearly 85 per cent of euro credit transfers met the relevant requirements. One of the most challenging rules of the Regulation determines that after the deadline, payment service providers must ensure the use of SEPA message formats in all cases where a corporation or public authority initiates or receives individual credit transfers or individual direct debits which are not transmitted individually but are bundled together for transmission. Payment service providers may be allowed to provide their customers with conversion services to SEPA standards only with limitations, subject to specific conditions. Another important rule of the Regulation stipulates that payment service providers may not require their users to indicate the business identifier code of the beneficiary’s bank (“BIC code”) upon initiating the credit transfer.

Establishing the basic infrastructure for instant payment services is considered to be one of the most crucial developments affecting Hungarian payment system, which will enable the use of payment solutions that are much faster than the currently available electronic payment services and can be used 24 hours a day.

With a view to accelerating the execution of payment transactions even further and to broaden the potential use of electronic payment methods, in 2015 the MNB commenced preparations for developing the infrastructure for instant payments. This may have a profound effect on the functioning of the existing payment systems and entails extremely complex payment system developments, both on the part of banks and on the part of the central systems. The new payment system will enable payment transactions to be executed within a few seconds every day of the year, twenty-four hours a day, and electronic payment will be an option in numerous situations where so far only cash payment has been possible. In the case of private individuals, person-to-person payments and in retail payments, new payment solutions may emerge, and the possibility of prompt execution may curb the distrust-driven incentive to use cash in the corporate sector. In addition, the new basic infrastructure may promote the development of new, innovative payment solutions, which, on the one hand, will improve the competitiveness of the Hungarian banking sector in the long run and, on the other hand, will simplify the market entry of new participants providing innovative services.

With more frequent daily clearing of forint payment card transactions, merchants may receive the amounts of payment card purchases faster than before, which may encourage the expansion of the card acceptance infrastructure.

One of the fundamental goals of the MNB's payment system developments is to accelerate payment transactions, including the clearing of card purchases. In the case of the most dynamically growing electronic payment method, payment card purchases, merchants accepting payment cards generally cannot collect the value of purchases until 1 or 2 days after the transaction. This is a serious lag compared to credit transfers, which have been processed in intraday clearing system for the past 4 years; therefore, accelerating the crediting to merchants' payment accounts is clearly justified. To that end, GIRO Zrt. has launched a project to commence preparations for developing a multi-cycle intraday clearing process for transactions executed by domestically issued payment cards in the Hungarian card acceptance network.

In 2015, the KELER Group continued to implement its institutional development strategy, assigning key priority to taking advantage of international business opportunities. The Group is expected to join TARGET2-Securities – the common, pan-European settlement infrastructure – in 2017.

KELER Ltd. and KELER CCP Ltd. – in which the MNB holds a direct and an indirect majority interest, respectively – continued to expand the range and quality level of its services in 2015. During the year, the KELER Group expanded its customer base primarily in the energy market and the gas market, establishing partnerships with larger actors in the region. It also introduced new services, such as an order routing platform (WARP) supporting the distribution and settlement of open-ended investment fund units, and its Trade Reporting service, which facilitates the discharge of the reporting obligations prescribed by European regulations. KELER Ltd. continued its preparations for joining the common pan-European securities settlement platform, TARGET2-Securities (T2S) on 6 February 2017.

Cyber risk is an increasing threat worldwide, and also impacts financial market infrastructures; addressing this issue, therefore, is of key significance.

Addressing the issue of cyber risk is considered to be one of the most significant challenges of our time, as cyber attacks on financial market infrastructures – due to their central role in the financial sector – also carry systemic risks. Recognising the problem, numerous international organisations, including BIS-IOSCO, have drawn up recommendations regarding the containment of cyber risk. The MNB has also offered a number of proposals, with respect to the relevant application guidelines. The adaptation and implementation of the international recommendations into the Hungarian oversight methodology is in progress.

The ratio of payment card fraud to total turnover remains low, despite the fact that fraud associated with domestically issued payment cards and with the Hungarian acceptance network increased in the past period.

Payment card turnover increased dynamically in the past period with an inevitable increase in payment card fraud. At the same time, the number of fraud cases and the value of losses sustained remained low relative to total turnover and also by European comparison. Based on the European Central Bank's card fraud report published in July 2015, according to data available for 2013, Hungary has the lowest rate of fraud from an issuing perspective. Thanks to consumer protection regulations, customers bore only 11 per cent of all fraud losses.

1 Introduction

One of the main responsibilities of the Magyar Nemzeti Bank (MNB) as set forth in the Act on the Magyar Nemzeti Bank is to promote the smooth execution of payments and the reliable and efficient functioning of the payment and settlement systems. The broader use of fast, secure and cost-efficient 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 economic and financial transactions initiated by economic agents by providing high quality services in accordance with regulations. Consequently, oversight of the payment and settlement systems is a key responsibility of the central bank. The reliability, efficiency and liquidity management of the systems and the relevant interdependent services are monitored and analysed in a risk-based oversight framework.

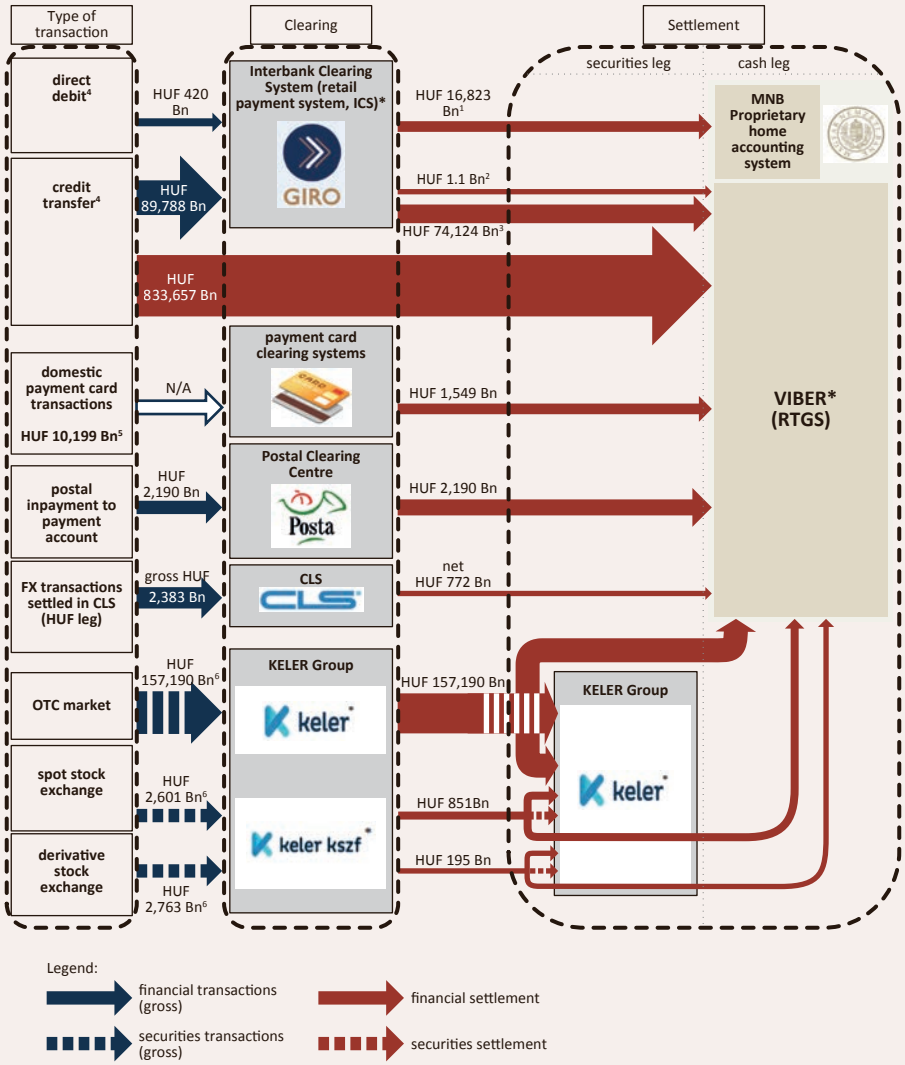
The MNB fundamentally acts as a catalyst in improving efficiency: it prepares, analyses and uses the tools of active coordination and dialogue to create conditions where stakeholders take into consideration the interests of society in making their decisions. The more extensive use of electronic payment 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. Compliance with the requirements set out in decrees and in the Act on the Provision of Payment Services is monitored by the MNB.

The first part of this Report presents current trends in the development of Hungarian payment methods, changes affecting the efficiency of payments and the pricing of services, and developments related to the operation and oversight of the Hungarian financial market infrastructures. The findings of payment inspections are also described in this part of the Report. In addition, from 2015, the first part provides an overview of the main results of the developments implemented in payment and settlement systems in the previous year. The second part of the Report discusses in detail three priority subjects related to the Hungarian financial market infrastructures: current issues in relevant Hungarian and international regulatory activities, ongoing and pending developments affecting the financial market infrastructures, and security issues relevant to payment systems.

2 Operation of the domestic payment system

The smooth execution of payments and the reliable, efficient operation of financial infrastructures are essential for the execution of real economic and financial transactions. Payments in central bank or commercial bank money, and transactions affecting securities and other financial instruments require

Chart 1
Overview of the Hungarian financial infrastructure
(2015)



[1] *Transactions settled in the overnight clearing system, in which transactions differing from direct debit and credit transfers are also settled.*
[2] *Transactions settled in the second cycle of the overnight clearing system (due to queuing or late submission).*
[3] *Electronic credit transfers settled in the intraday clearing system as from 2nd of July 2012.*
[4] *On-us transactions are not included.*
[5] *Only the interbank part of total payment card transactions is cleared in the payment card clearing systems.*
[6] *Securities transactions (gross)*
** Overseen systems*

centralised systems for the clearing and settlement of transactions. The Hungarian Real-Time 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 infrastructures. The Interbank Clearing System (ICS) is a domestic, retail gross payment system 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) and the central counterparty (KELER CCP), are responsible for securities clearing and settlement services, and the registration of domestically issued securities (Chart 1). The oversight activity of the MNB covers the operations of VIBER, the ICS, KELER and KELER CCP.

2.1 Payment service developments

2.1.1 TURNOVER OF MAIN PAYMENT INSTRUMENTS

Similar to recent years, the turnover of electronic payment methods increased in 2015, and this growth was primarily reflected in the turnover of payment cards[1] (Chart 2). In the second half of the year, the number of payment card purchases rose by more than 20 per cent in year-on-year terms. Credit transfer turnover increased by 2 per cent and as a result, the number of credit transfers exceeded 300 million transactions during the year. At around 2.5 per cent, the increase in direct debit transactions was comparable to recent years. The number of cash withdrawals decreased by more than 1 million compared to 2014, and the number of such transactions was close to 117 million during the year.

Chart 2
Turnover of main transaction types related to payment accounts
(2010–2015)

The number of customers holding payment accounts remained largely the same. As in recent years, the moderate decline in the number of payment accounts continued, presumably mainly associated with customers' cost rationalisation. The decline in the number of accounts typically affected customers holding more than one account, and according to the MNB's consumer surveys,[2] the ratio of the banked population did not change considerably. The continuous increase in the number of accounts accessible through the internet was consistent with the trend of the previous period, and the ratio of these accounts approached 80 per cent.[3]

The number of online merchant outlets rose by almost 25 per cent in 2015. While the number of payment cards remained less than 9 million in 2015, the number of physical merchant outlets (82,500) rose by 9 per cent compared to the previous year, and the number of merchant POS terminals (101,000) also increased by more than 7 per cent. Compared to the total number of retail stores,[4] the number of merchants accepting payment cards rose dynamically: while payment cards were accepted in 37 per cent of stores in 2010, this ratio had risen to 53 per cent by the end of 2014. The number of online merchant outlets exhibited the strongest growth: by the end of 2015, it had risen by more than one quarter compared to the previous year, but this still only represents 9 per cent of all merchant outlets.

The turnover of payment card purchases – the most popular electronic payment method – grew even more noticeably than in previous years (Chart 3). In the second half of 2015, the growth in the turnover of card purchases exceeded 20 per cent year-on-year, both in terms of transaction number and value. The total value of nearly 430 million payment transactions executed during the year was HUF 3,200 billion, which means an average value of almost HUF 7,500 per transaction. Card-not-present purchases, completed mainly on the internet, rose by more than 34 per

[1] Detailed payment statistics are included in the payment table set available on the MNB's website: http://www.mnb.hu/en/statistics/statistical-data-and-information/statistical-time-series/xiv-payment-systems/payment-data
[2] Ilyés – Varga: Show me how you pay, and I will tell you who you are – Socio-demographic determinants of payment habits. Financial and Economic Review, Vol. 14 (2), June 2015, pp. 26–61.
[3] Published at the end of 2015, the short video entitled "Let's pay via Internetbank!" presents useful information about the procedure of internet banking: https://www.youtube.com/watch?v=o4-GubRR4YI&nohtml5=False
[4] Source: HCSO http://www.ksh.hu/docs/hun/xstadat/xstadat_eves/i_okk016.html

cent, which is almost double the increase observed in the turnover of physical points of sale. However, the turnover of online points of sale remains low relative to total payment card turnover: it is 5.5 per cent in terms of number and over 8.5 per cent in terms of value. According to the expanded payment table set, in which the MNB also publishes flow data by card type, payments with debit cards account for almost 85 per cent of total card turnover, both in terms of the number of transactions and their value.

Cash withdrawals with payment cards rose slightly in number but somewhat more noticeably in value (Chart 3). After the decline in the number of payment card cash withdrawals in recent years, there was a moderate increase in 2015, while the value of cash withdrawals was up 7 per cent. Accordingly, the average value of cash withdrawal transactions with payment cards rose to HUF 63,000. At the same time, cash withdrawal turnover varies widely depending on individual cash withdrawal methods. The average value of ATM transactions, which account for 96 per cent of the population's cash withdrawals by card, was less than HUF 59,000 during the year, compared to cash withdrawals at the POS terminals installed at branches – a preferred method in the corporate sector – which amounted to HUF 185,000 on average.

The most prominent change affecting payment cards in the past year was the spread of contactless card technology, which provides the means for simpler, faster and more convenient payments (Chart 4). Thanks to the rapid development of the contactless payment infrastructure, the number of contactless cards grew by nearly 30 per cent, while the number of contactless enabled POS terminals rose by almost 38 per cent. As a result, at the end of 2015 53.6 per cent of all cards and 62.5 per cent of all POS terminals were compatible with the new technology. Although contactless cards support much faster and far more convenient payments than before, the ratio of contactless transactions to the total turnover of card purchases still lags substantially behind the level of development of the infrastructure. In 2015, a remarkable increase was seen compared to the previous year: the turnover of contactless purchases surged by 60 per cent (62.7 per cent in terms of volume and 59.8 per cent in value). As a result, nearly one third of all transactions are completed using this technology, accounting for 18 per cent of their total value.[5] As the average value of contactless purchases (HUF 3,600) represents one half of all purchase transactions, and these transactions may have thus presumably replaced numerous cash payments. Data indicate that customers not only used the contactless

Chart 3
Annual growth rate of transactions with payment cards issued in Hungary (year-on-year)
(2010–2015)

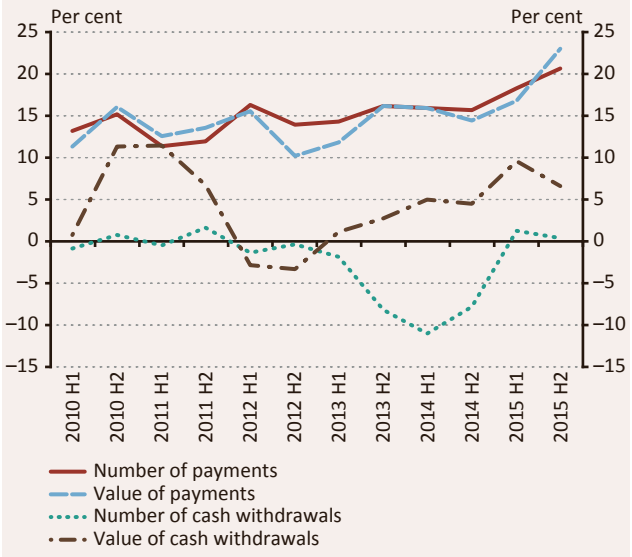
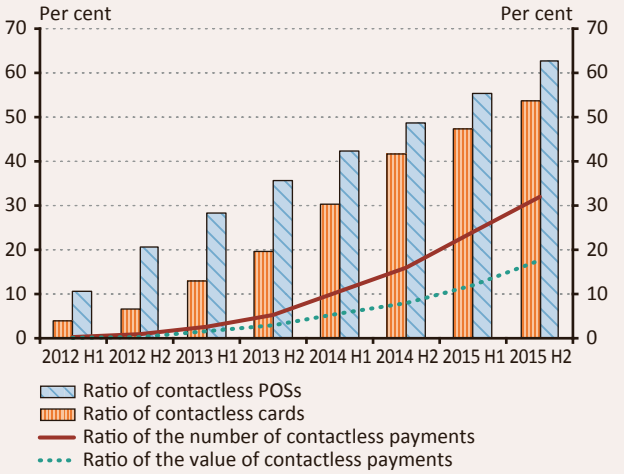


Chart 4
Spread of contactless card technology in the Hungarian payment card system
(2012–2015)



[5] Released at the end of 2015, the short video entitled "Pay more often with your payment card!" is intended to promote the use of contactless card payments: https://www.youtube.com/watch?v=r60hl3DpvKY&nohtml5=False

technology in situations where they would have paid by card in the past in any case; apparently, the new solution has also begun to replace their previous cash transactions.

2.1.2 EFFICIENCY OF DOMESTIC PAYMENTS IN INTERNATIONAL COMPARISON

In 2015, all indicators measuring the efficiency of Hungarian payment system increased compared to the previous year (Table 1). All three indicators measuring the development of credit transfers, electronic purchases and electronic bill payments increased in 2015. It is the ratio of credit transfers to GDP where Hungarian payment transactions are most in line with the European level. The annual value of credit transfers initiated by Hungarian bank customers is almost 15 times higher than Hungarian GDP, while the corresponding European average is around 17. The growth rate of this indicator is modest, showing a moderate increase compared to the previous year.

Owing to the rising turnover of payment card purchases, significant progress has been made in respect of the share of electronic payment methods in retail purchases. The "electronic payment of retail purchases" indicator was up 2.6 percentage points, reflecting a substantial, 20 per cent annual increase in the turnover of payment card purchases. Nevertheless, compared to the European average of 30 per cent, there is still room for improvement. As a result of the dynamic increase in payment card turnover in recent years, the indicator has improved by 5.7 percentage points since 2012, which translates into a 50 per cent increase. The spread of contactless card technology may also have played an important role in this development.

There was a robust, 8 percentage point increase in the share of electronic bill payments. Of all three indicators under review, bill payments demonstrated the largest lag in comparison to the European average. This can be mainly explained by the restrained use of the direct debit payment method and the popularity of postal inpayment money orders (yellow cheques) and postal bill inpayment orders (white cheques) among the Hungarian population, which is considered to be a Hungarian peculiarity. Recent developments implemented by the Hungarian Post Office, in particular, the favourable terms of the use of bank cards in case of postal order payments brought a significant positive change in this regard. Owing to the positive developments, one third of utility bills and other service charges are now paid electronically compared to the previous ratio of one fourth. With rising card payment turnover and the increasingly widespread use of innovative payment solutions, this positive change may continue or even accelerate.

Table 1
Changes in indicators measuring the level of development of Hungarian payment system compared to the EU

Indicator	Calculation method	Hungary				European Union
		2012	2013	2014	2015	2014
Credit transfers	Annual value of credit transfers / GDP	13.6[1]	13.6[1]	14.4[1]	14.8	17.0
Electronic payment of retail purchases	Annual value of payments made by payment cards and other electronic solutions / Annual household consumption	11.8%	13.0%	14.9%	17.5%	30.4%
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%	33.6%	70%[2]

Source: MNB, ECB

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

2 Estimated value based on the data supply of individual EU Member States, per capita core direct debit figures and the study of Deutsche Bank (2005).

Box 1

Short films on payment transactions

The past few years brought about several important technical and technological innovations in the area of payment services, especially with regard to certain payment solutions. However, previous surveys by the MNB reveal that most consumers basically have reservations about innovative payment solutions. Users of payment services only begin fully taking advantage of new or payment solutions which are new to them after they have gathered sufficient information about their functioning. With the publication of three short informative videos, the MNB wished to contribute to enriching this knowledge.

The film entitled "Pay more often with your payment card!" provides information on the advantages of payment card use, how to request the contactless payment cards introduced in recent years, how and in what situations to use contactless cards.
https://www.youtube.com/watch?v=r60hl3DpvKY&list=PLvWrKQkxKDHvv4DI5phEeL_LDuylHICpg&index=13

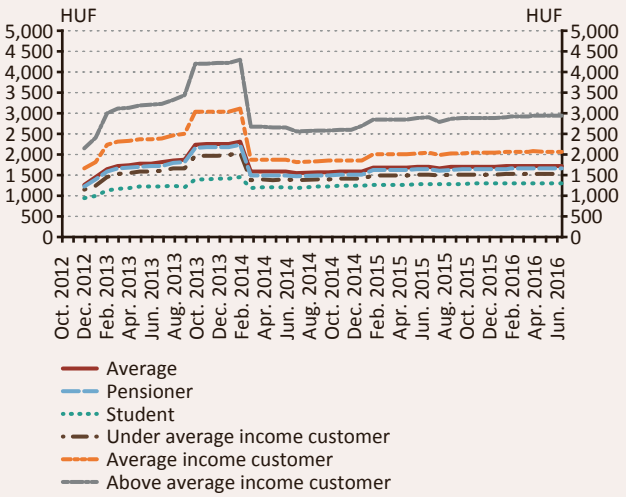
Most of the payment developments implemented in the past years were intended to offer various options for the payment of utility bills and other service charges. The short film entitled "How to pay your bills with your payment card?" presents these new bill payment methods.
https://www.youtube.com/watch?v=ar6uGpB3b9Q&index=14&list=PLvWrKQkxKDHvv4DI5phEeL_LDuylHICpg

Although it has been possible to do finances online via internet banking access for many years now, online banking has not yet become truly widespread for lack of sufficient information. The short film entitled "Let's pay via Internetbank!" is meant to provide assistance in understanding internet banking payment option and the steps of its use.
https://www.youtube.com/watch?v=o4-GubRR4YI&list=PLvWrKQkxKDHvv4DI5phEeL_LDuylHICpg&index=15

2.1.3 CHANGES IN THE PRICING OF RETAIL PAYMENT SERVICES AND COSTS FOR RETAIL CUSTOMERS

Average costs for retail customers have remained essentially the same in the past two years, to a great degree reflecting the low inflation environment (Chart 5). The payment pricing monitoring system developed by the MNB has been monitoring the changes in retail payment services since 2012. After the steep increase in service fees in 2013, the charges perceived by customers moderated considerably after the introduction of two free cash withdrawals per month in 2014. According to detailed data, the pricing of payment services stabilised from the second half of 2014; most service providers maintained their previous fees, while those raising their charges typically adjusted their fees to the prevailing inflation rate. At the beginning of 2016, the average monthly payment costs of retail customers was HUF 1,650, which is broadly in line with the level observed at the end of 2015.

Chart 5
Changes in average monthly payment costs for retail customers
(Oct. 2012 – Jun. 2016)



At the beginning of 2015, the payment pricing monitoring system of the MNB was expanded both with respect to data content and in terms of the number of account packages reported by payment service providers. Previously reported account packages indicate that payment costs did not change considerably after the methodological changeover; the difference between the two time series is fully attributable to the difference in the calculation method.

Chart 6
Average payment costs per customer for various types of services
(Nov. 2012 - Mar. 2016)

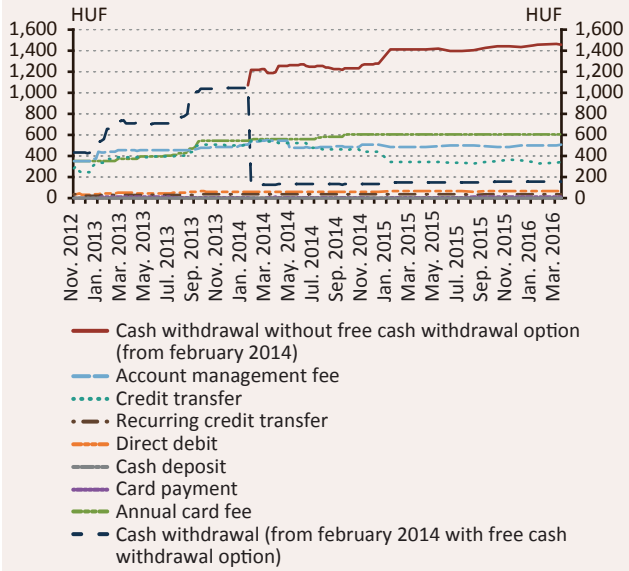
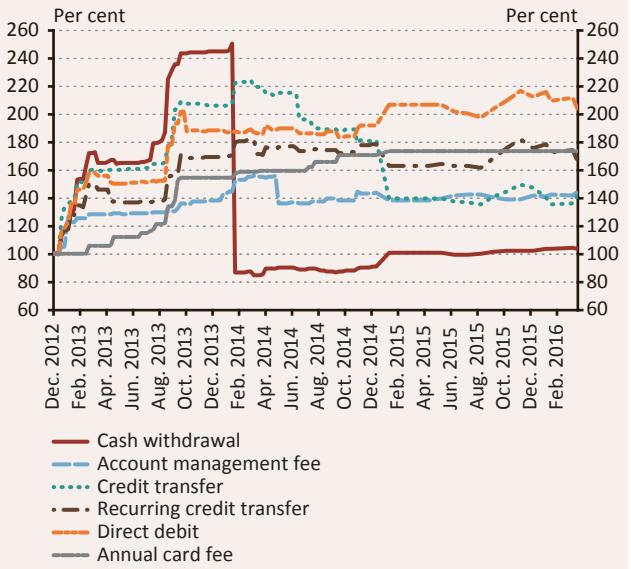


Chart 7
Changes in the pricing of main service types
(Dec. 2012 - Feb. 2016)



Note: 1 December 2012 = 100 per cent

Looking at the range of payment services, cash withdrawal fees rose slightly further in 2015, but this increase was not as pronounced as the price changes seen in the previous years. The detailed payment pricing monitoring system distinguishes between several domestic and international cash withdrawal options. The results gleaned from the system reveal that the charges imposed on customers are only moderately higher than in 2014 (Charts 6 and 7). That notwithstanding, the cash withdrawal costs of customers who failed to submit a request for the free cash withdrawal option are still high. The annual costs of payment cards remained stable in the past year, but they vary widely among the various payment card types. The average level of account management fees was roughly the same in 2015 as in 2014. By contrast, estimated for the full range of customers, credit transfer charges declined overall. The main reason for this is the fact that, thanks to the methodological changeover mentioned above, the MNB can now also monitor charges associated with accounts no longer offered by payment service providers. Some of these phased-out account packages were low-cost or complimentary at the outset; therefore, they were less affected by the fee increase that followed the introduction of the financial transaction duty.

2.2 Developments in 2015 relating to financial infrastructures

2.2.1 INCLUSION OF THE FORINT IN THE CLS SYSTEM, EXPERIENCES REGARDING THE OPERATION SO FAR

On 16 November 2015, the Hungarian forint was the first country in the Central European region to join the international foreign exchange settlement system operated by CLS.[6] As a result of the inclusion, the Hungarian legal tender joined the currencies of Australia, South Africa, the United States, the United Kingdom, the euro area, Hong Kong, Israel, Japan, Canada, South Korea, Mexico, Norway, Switzerland, Sweden, Singapore and New Zealand to become a settlement currency in a system that, in view of its risk and liquidity management solutions, can be rightfully regarded as the leading infrastructure for the international foreign exchange market. The inclusion project launched by the MNB and CLS in January 2014 was completed in less than two years, demonstrating the extraordinary commitment of the project organisation and decision-makers. During the lifetime of the project, the Financial Stability Board of the MNB and the Board of Directors of CLS passed a decision of support on two occasions, in October 2014 and in November 2015, based, in both cases, on the achievements of the preceding project phases. With the inclusion the settlement risk associated with FX transactions involving the forint can be managed efficiently, which further improves the stability of the Hungarian banking sector. According to the MNB's expectations, recourse to the system will increase continuously in the coming years as an increasingly broad range of Hungarian and foreign FX market participants decide to channel their forint transactions into the CLS settlement service. Accordingly, the MNB will continue to monitor the accession aspirations and the results of Hungarian stakeholders, and it will maintain its expectation that an increasing number of Hungarian market participants build up their own direct or indirect access to the system.

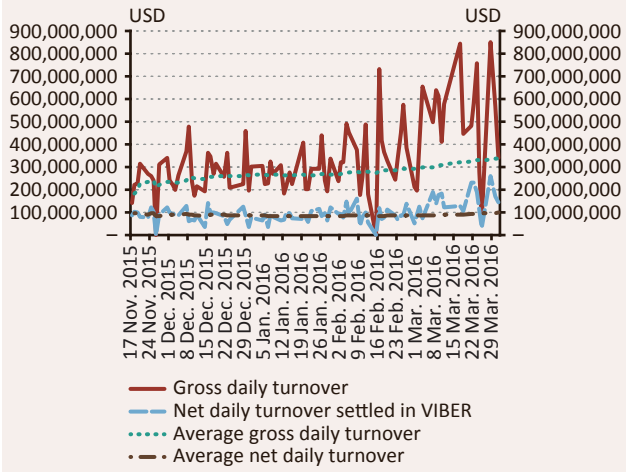
Thanks to the inclusion of the forint, CLS offers to Hungarian banks a solution for the eventuality of such market turbulences where access to international foreign exchange markets becomes problematic. With CLS membership, the Hungarian market gained access to such a new tool that could become extremely important in crisis situations similar to that experienced in September 2008. Operating in an open economy, domestic banks process a substantial volume of foreign currency transactions, and their viability greatly depends on the foreign currency liquidity accessible through their foreign partner banks. In the event of a downgrade of a country's risk rating, foreign partners may shun the domestic banks of the country concerned, with potentially severe consequences for the foreign currency liquidity position of the institutions. In such situations, satisfying demand for foreign currency would be less difficult – if at all – for a CLS member bank; indeed, the reduced foreign exchange settlement risk associated with the CLS membership would automatically ensure a more favourable risk rating for the bank. The advantage of using the system, therefore, becomes the most apparent in the event of market turbulences; at the same time, it also improves efficiency in a calm market environment as, thanks to the multilateral net settlement principle, the system reduces the level of liquidity required for the settlement of banks' foreign exchange turnover and increases the foreign exchange turnover that can be settled with the given liquidity level, i.e. it improves the trading potential. On the whole, the CLS system guarantees efficient bank operations in a normal foreign exchange market environment and enables normal bank operations to continue in a turbulent FX market environment, the significance of which is clearly underscored by the events of 2008.

Thanks to banks' participation, forint turnover settled via the CLS system shows a steady increase, but the service is still not being used to its full potential.

[6] See: Balla – Pintér: Az MNB és a CLS új eszközt ad a hazai devizapiac kezébe (The MNB and CLS offer the Hungarian foreign exchange market a new instrument). Parts 1 and 2:
http://www.mnb.hu/letoltes/balla-gergely-patrik-pinter-cecilia-az-mnb-es-a-cls-uj-eszkozt-ad-a-hazai-devizapiac-kezebe.pdf
http://www.mnb.hu/letoltes/balla-gergely-patrik-pinter-cecilia-az-mnb-es-a-cls-uj-eszkozt-ad-a-hazai-devizapiac-kezebe-2-resz.pdf

Maximising its use would be of utmost significance for the national economy. On 16 November 2015, a limited circle of banks began to use the new service and initial experiences confirm that the infrastructure cooperation fully meets both security and operational expectations, and is prepared for the integration of additional market participants. Between 16 November 2015 and 31 March 2016, the daily value of the forint transactions settled in CLS amounted to USD 336.6 million on average, and on the busiest day, the gross volume settled in the system peaked at USD 850.9 million (Chart 8). The average value of the netting effect was 67 per cent in the review period, which means that only 33 per cent of gross positions were needed to be covered by real forint liquidity on average. In view of the multilateral netting principle, this percentage is expected to grow in line with the rising coverage of market participants; consequently, it is also in the interest of market actors already participating in the system to encourage their partners to use the CLS service. In the near future, therefore, the MNB expects an increase in the forint turnover settled in the CLS as a combined result of market and central bank incentives.

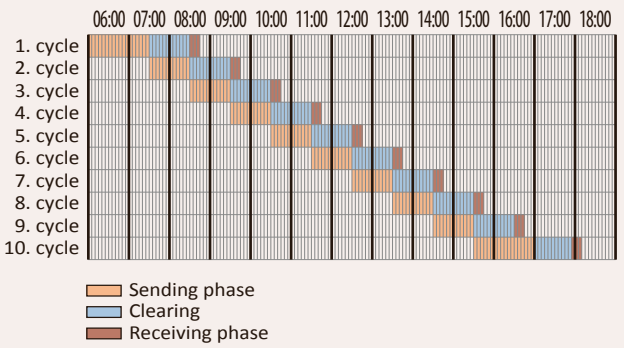
Chart 8
Daily gross forint turnover settled in the CLS system versus the related net forint turnover settled in VIBER (USD)
(17 November 2015 – March 2016)



2.2.2 IMPACT OF THE HIGHER CYCLE FREQUENCY OF THE ICS INTRADAY CLEARING

Doubling the number of intraday clearing cycles in the ICS and extending the operating hours from September 2015 accelerated domestic payment transactions to a degree that was also perceivable by customers. In its capacity as a regulator, developer, overseer and owner, the MNB strives to continuously develop the payment system. Since the introduction of intraday credit transfers, the MNB has monitored the functioning of the new system and the actual execution time of the transactions processed. Analyses indicated that even though 4 hours are legally available for the execution of credit transfers, with 5 settlement cycles a day, the value of credit transfers was credited to the beneficiary's account within 2 hours on average. Of these two hours, however, credit transfers spent one hour waiting to be cleared. Based on these experiences and considering that the MNB indicated its intention to increase the number of cycles upon the introduction of intraday clearing already, from 7 September 2015 the speed of credit transfers accelerated further. Owing to the implementation of the development the number of intraday clearing cycles rose from 5 to 10, which means that credit transfers are now cleared in the system at hourly intervals (Chart 9). The increased frequency of the clearing cycles also modified the operating hours of the system. The first cycle starts an hour earlier, which primarily benefits retail customers by ensuring the earlier execution of the credit transfers submitted after the end of the previous business day. The extension of the operating hours of the ICS by half an hour in the afternoon, in turn, is beneficial for corporations, leaving more time for executing their financial transactions. Similarly, the number of further payments that can be executed from the incoming credit transfers during the same day is on the rise, which has improved the efficiency of the financial management of the corporate sector. In addition, the waiting time may decrease for transactions following the execution of payments (e.g. purchase and sale, acceptance of goods); therefore, payment by credit transfer may often become a favourable alternative to cash payments.

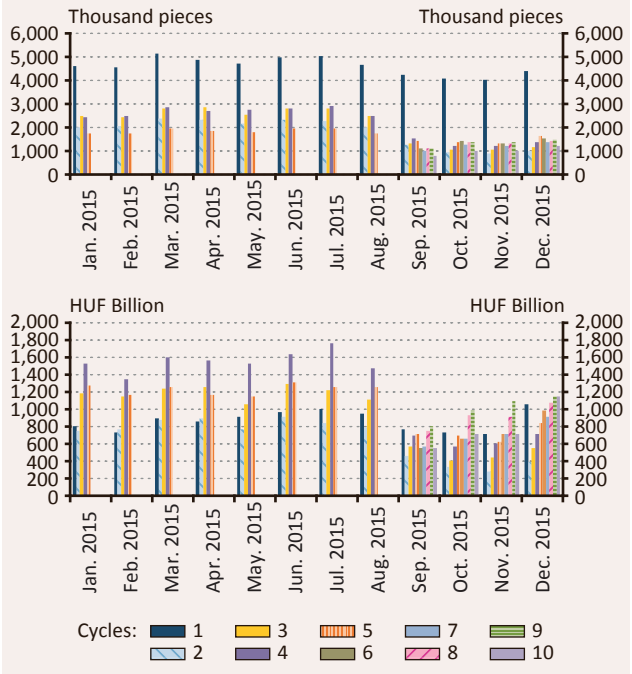
Chart 9
Clearing cycles in the intraday system of the ICS from 7 September 2015



Source: GIRO Zrt.

The frequency of clearing cycles was increased smoothly and its effects are beneficial for the payment system. The hour-long dead time between two cycles was eliminated: in practice, credit transfers accelerated and may even reach the beneficiaries in as little as one hour. While the higher cycle frequency did not change the performance of the system, deadlines became tighter. As expected, without giving rise to capacity problems, this improved the liquidity of the system, essentially reducing the number and value of individual cycles by half (Chart 10), which resulted in a more even distribution of the intraday transaction turnover. The first cycle now starts an hour earlier and it continues to process the highest number of transactions, as it is responsible for clearing all – typically retail – credit transfers initiated after the end of the previous business day. In terms of value, the largest portion of the turnover is still concentrated in the last few cycles; however, because of the sharp fall in the turnover value of individual cycles (Chart 10), participants require less liquidity for the execution of the cycles. This significantly decreases the clearing and settlement risk that arises from the fact that raising funds for high-turnover cycles toward the end of the day may be difficult if the given participant has failed to accurately estimate its daily liquidity need .

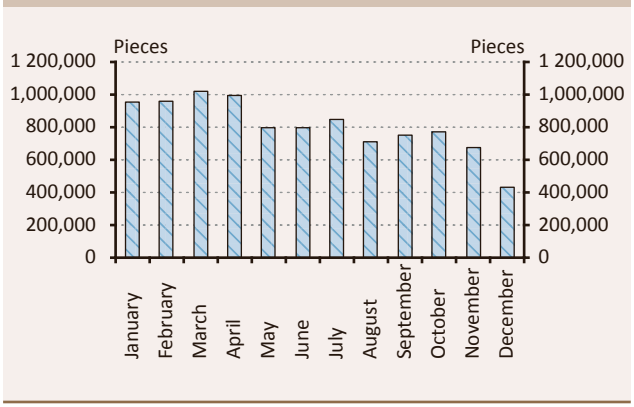
Chart 10
Monthly breakdown of the number of transactions (top chart) and value (bottom chart) processed in intraday clearing for each cycle
(2015)



2.2.3 MIGRATING PAPER-BASED CREDIT TRANSFERS TO INTRADAY CLEARING

As of 1 January 2016, all forint denominated credit transfers submitted on paper to credit institutions for interbank clearing are processed in the intraday clearing system of the ICS. After the introduction of intraday clearing system in 2012, only paper-based credit transfers, debit-type transactions and the credit transfers of the Hungarian State Treasury remained in the overnight clearing system. In 2015, yet another step was made toward migrating all transactions from the overnight clearing system to the quicker, more state-of-art intraday clearing system. At present, in addition to the credit transfers of the Hungarian State Treasury, only debit transactions are cleared in the overnight system. Importantly, however, even though transactions submitted on paper are now cleared in a faster system, the statutory 4-hour rule remains applicable only to electronically submitted credit transfers. ICS members began to migrate their credit transfers to the intraday clearing system (Chart 11) ahead of the deadline; thus, apart from some random exceptions, essentially all credit institutions had completed the migration by the pre-defined deadline. The migration affected around 800,000 transactions each month, which roughly corresponds to the daily turnover of the intraday clearing system.

Chart 11
Number of credit transfers processed in overnight clearing in a monthly breakdown
(2015)



2.2.4 NEW SERVICES OF THE KELER GROUP

As in previous years, in 2015 the KELER Group introduced and made widely available several new services, including the settlement of investment fund units, supporting the discharge of reporting

obligations, the issue of LEI codes, and also participated in international service provision. The KELER Group is committed to improving service levels and keeping up with industry trends in its provision of domestic and international services. Among its new services offered in the domestic market, special mention should be made of WARP, a routing platform introduced at the end of 2014 for supporting the distribution and clearing of open-ended investment fund units, and its Trade Reporting service, which facilitates the discharge of the reporting obligations prescribed by European regulations. In addition to the ability of the latter to meet the reporting requirements prescribed by Regulation (EU) No 648/2012 (EMIR)[7] for derivative transactions (from 2016), this service is also suitable for supporting data supplies on the exchange-traded transactions of the wholesale energy market as specified in Regulation (EU) 1227/2011 (REMIT). Moreover, as an intermediary, the KELER Group also continued to assist in code applications for the legal entity identifiers (LEI) required for the discharge of reporting obligations. As regards international service provision, on the one hand, developments were based on the decades of operational experience acquired by the KELER Group and, on the other hand, on the competition-boosting effect of European regulatory and infrastructure efforts. KELER CCP has transformed its clearing system to a multi-currency system and is now prepared to provide services to its newly acquired clients not only in HUF and EUR, but also in GBP or USD. The need for this move arose from the fact that KELER CCP – as a general clearing member service provider – already provides services to selected clients on the Austrian, German, French, Czech, Slovakian, Serbian, Dutch, Belgian and UK energy exchanges.

2.2.5 THE MAGYAR NEMZETI BANK PURCHASED A MAJORITY INTEREST IN THE BUDAPEST STOCK EXCHANGE

At the end of 2015, the Magyar Nemzeti Bank acquired a majority interest in the Budapest Stock Exchange. As a result, the most important financial infrastructures of Hungary are now controlled by the MNB.[8] On 20 November 2015, the MNB signed a Share Purchase Agreement with Austrian CEESEG AG and Oesterreichische Kontrollbank AG which together held a 68.8 per cent ownership share in the Budapest Stock Exchange (BSE). As a result of the transaction, the central bank raised its stake in BSE to 75.75 per cent. The MNB's acquisition of a qualified majority in the BSE was intended to develop the Hungarian stock exchange and, by opening up new markets and involving new issuers, to create an adequately sized, efficiently operating capital market. Through stock market transparency, this contributes to the structural development of the Hungarian financial system; and moreover, it may ensure that, besides bank loans, the option of capital market borrowing is available in the Hungarian market in healthier proportions than today. The renewed institutional strategy of BSE is aimed at the introduction of new services, and it also places emphasis on reinforcing the global relationship network and on cooperating with the relevant market participants.

2.2.6 RESULTS OF POST OFFICE DEVELOPMENT PROJECTS IN 2015

Data available confirmed the forecast that the developments implemented in recent years by Magyar Posta Zrt. (Hungarian Postal Service) and the Magyar Posta Group in the area of payment services facilitate the widespread use of electronic bill payments.[9] In Hungary, most utility and other regular bills are still paid via postal payment services using postal inpayment money orders (yellow cheques) and postal bill inpayment orders (white cheques). In 2015, customers paid 215 million yellow and white cheques via Magyar Posta Zrt. with a total value of HUF 2,190 billion. Of this, 10.3 million yellow and white cheques amounting to HUF 97 billion were paid as electronic purchase transactions completed with payment cards at newly installed POS terminals at post offices, and 650,000 cheques were paid through other, contemporary channels (e.g. mobile application, bill inpayment machines) with a total value of more than HUF 6.5 billion in 2015. Of the utility and other bills presented electronically by the service of Díjnet Zrt., a member of the Magyar Posta Group, 1.8 million bills amounting to HUF 16.1 billion were paid through one of the payment options available on the service. Considering, however, that the option of payment through payment card as purchase transactions via POS terminals has only been available since mid-2015, in 2016 the contribution of Magyar Posta to the spread of the electronic payment of service bills is expected to be even greater than in 2015.

[7] Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories.

[8] http://www.mnb.hu/sajtoszoba/sajtokozlemenyek/2015-evi-sajtokozlemenyek/ismet-nemzeti-tulajdonban-a-magyar-tozsde
http://www.mnb.hu/sajtoszoba/sajtokozlemenyek/2015-evi-sajtokozlemenyek/megkezdte-munkajat-a-nemzeti-tulajdonba-kerult-tozsde-uj-vezetese

[9] Source: https://www.posta.hu/aktualitasok/Bejottek_a_csekkfejlesztesek and https://www.posta.hu/aktualitasok/Egyre_tobben_dijneteznek

2.3 Operation of financial infrastructures

In 2015, in terms of value and volume, the turnover of the overseen systems fell by 10 per cent on average compared to the previous year. The GDP-proportionate annual turnover amounted to 44.48 times the amount of annual GDP (Table 2). In 2015, the ICS and KELER CCP saw an increase in turnover, while turnover for VIBER and KELER declined. During the year, the value and volume of the ICS turnover reached the highest level observed since the introduction of the service. The 3.5 per cent growth in the volume of transactions is consistent with the growth rate of the real economy. The increase in the number of transactions of direct debits doubled the number of individual credit transfers, as the number of settled direct debits increased in the wake of the phase-out of foreign currency loans, but due to the rise in wage-type payments, the number of direct credits also increased. The aggregate turnover of KELER CCP increased in 2015 (by 6 per cent), with the most salient growth observed in the case of clearing services provided in relation to derivative markets. The fall in total value of turnover in VIBER (5.6 per cent) and in KELER (38 per cent) can be mainly attributed to the decline in the transactions involving securities issued by the MNB as a result of the phasing-out of the MNB bill. In addition, as regards turnover in KELER, transactions submitted on a DvP and on a FoP basis both declined in terms of transaction number and value. As opposed to the decline in the value of VIBER transactions, transaction volume was up 5.7 per cent, mainly reflecting an increase in customer transactions, two-week and three-month central bank deposits and transactions related to the doubled clearing cycle frequency of the ICS intraday clearing.

As in previous years, operation of the overseen systems was highly reliable in 2015, supporting the safe and efficient functioning of money and capital markets. As an overseer, the MNB continuously monitors the risk exposure of financial market infrastructures. In this context, it monitors, assesses and analyses service continuity risk, clearing and settlement risk and system operational interdependency risk, as well as changes in other criteria affecting efficient operations. The requirements laid down in the new international principles (PFMI) have been also integrated into the evaluation methodology.

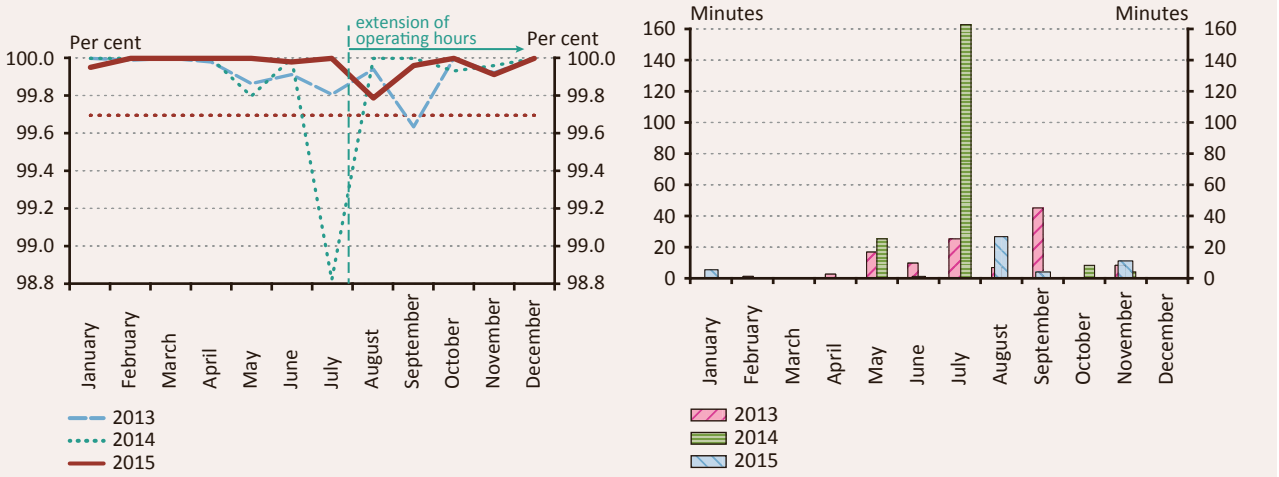
2.3.1 SERVICE CONTINUITY RISK OF FINANCIAL MARKET INFRASTRUCTURES

Numerous developments were implemented in the payment systems in 2015, which improved the efficiency of the systems without any undesired increase in operational risks. The availability of

Table 2
Turnover and main figures of the payment and securities settlement systems
(2014–2015)

Overseen systems		Volume (thousands)		Value (HUF thousand billion)		Turnover/GDP		Participants (2015)	
		2014	2015	2014	2015	2014	2015	Direct participant	Indirect participant
VIBER		1,392	1,472	1,322.6	1,248.4	41.47	37	46	114
ICS	Overnight clearing	158,288	160,492	16.8	16.8	0.53	0.49	38	158
	Intraday clearing	155,326	173,847	66.35	74.1	2.08	2.2	38	158
KELER CSD		747.2	538	253.4	156.2	7.95	4.63	273	n.a.
KELER CCP		1,533.5	1,689.7	5	5.3	0.16	0.16	106	n.a.

Chart 12
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)
(2013–2015)

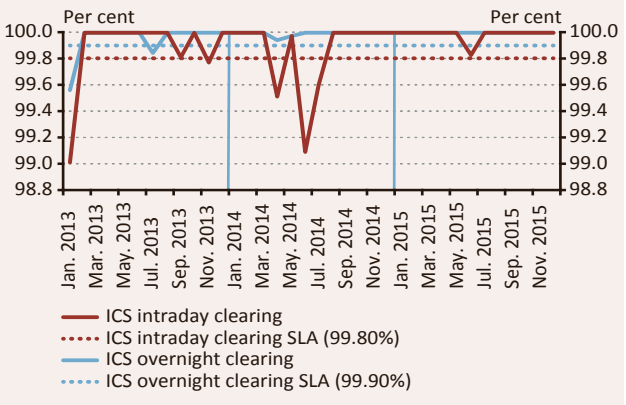


VIBER and the ICS improved compared to the previous year, but deteriorated slightly in the case of KELER and KELER CCP. Operational risks rose slightly in the overseen systems overall, mainly because of the increasing number of incidents, the severity of incidents perceivable by customers, and the growing number of operating hour extensions.

As in previous years, VIBER demonstrated a high degree of reliability in 2015; the risk of service continuity decreased slightly compared to 2014. As opposed to previous years, the monthly availability ratio of the core settlement service did not drop below the 99.7 per cent level expected by the international and domestic oversight practice in any month of the year (Chart 12). The number of outages of the core settlement service did not change compared to 2014, but the individual – and hence, the aggregate – duration of incidents fell by almost four fifths.[10] In 2015, two incidents caused notable interruptions in the service. In the first case, VIBER was down for 27 minutes due to a server shutdown, as a result of which the service opened later in the morning. As regards the second incident, although settlement in the central account management system of VIBER was uninterrupted, the system failed to send response messages to participants and the ancillary systems for 11 minutes. The operators of the system prepared a detailed report outlining the lessons from the incidents – mainly with regard to post-incident systems audits – and in this context, they defined a number of tasks to prevent the emergence of a similar situation in future.

In the ICS, both overnight and intraday clearing platforms functioned with high reliability throughout the year, but in 2015 the risk of service continuity increased somewhat. Thanks to performance-improving IT developments implemented during the year, both clearing platforms of the ICS processed transactions with high speed and adequate efficiency. The number of incidents declined compared to the previous year, and the emerging incidents were quickly corrected by GIRO. The two incidents occurring in 2015 – one of which

Chart 13
Impact of overnight and intraday clearing incidents on availability
(2013–2015)

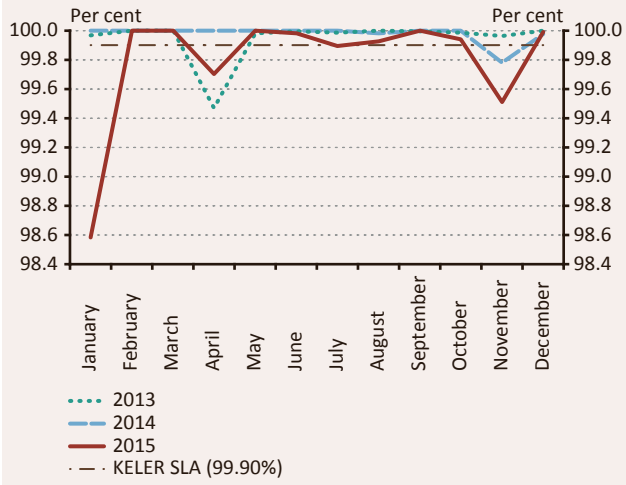


[10] On balance, in 2015 the aggregate duration of incidents resulting in the outage of core settlement services decreased by 152 minutes. The time between the start and the end (recovery) of incidents also decreased compared to 2014, with the longest downtime lasting for 27 minutes compared to 163 minutes in the previous year

affected the intraday, the other the overnight clearing cycle – did not, or only slightly reduced the level of the service (Chart 13). As there have been no incidents since September 2015, the higher cycle frequency did not exacerbate the operational risk.

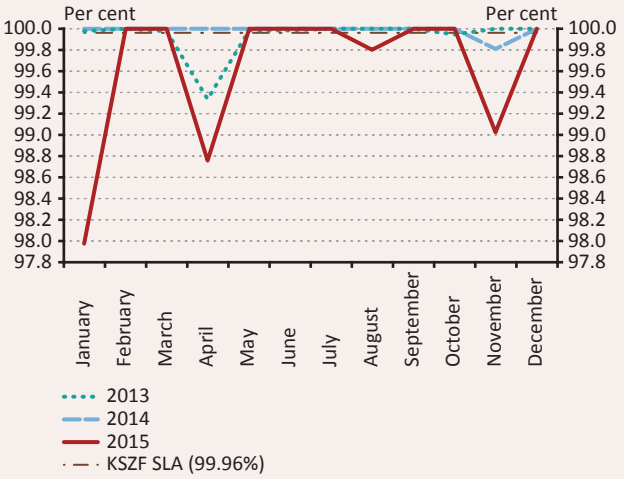
The service continuity risk of KELER increased slightly compared to previous years; however, KELER continued to operate with a high degree of reliability. The availability of KELER's services to customers deteriorated compared to 2014, as it failed to meet the expected 99.9 per cent level in four months of the year (Chart 14). This can be attributed to the moderate increase compared to 2014 in longer-lasting incidents affecting the information technology systems supporting business operations. These incidents were quickly corrected by KELER. At the same time, KELER has taken numerous measures to avoid the repeated occurrence of the corrected malfunctions in the future. The replacement of KELER's account management system – which has been postponed to 2016 due to some issues emerging during implementation – is expected to contribute to improving the harmony of KELER's fragmented IT architecture by replacing several existing systems currently in use.

Chart 14
Availability of KELER's central securities depository
(2013–2015)



The availability of KELER CCP's business operations decreased somewhat compared to previous years, but its level of service provision remained high. There is a mutual outsourcing agreement between KELER and KELER CCP. Under the agreement, the information technology infrastructure required for the provision of central counterparty services is operated by KELER. Consequently, the higher number and longer duration of the incidents affecting the information technology system of KELER compared to 2014 exerted an impact on the business operations of KELER CCP as well, which led to its failure to meet the expected 99.96 per cent availability level in four months of the year (Chart 15).

Chart 15
Availability of the KELER CCP central counterparty
(2013–2015)

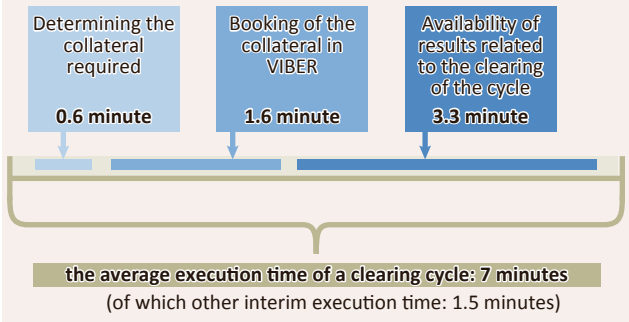


The execution time of the clearing and settlement of transactions in the payment systems became faster in 2015 in comparison to 2014, and it continued to meet the expected efficiency requirements. One important element in the execution time of payment orders is the speed at which VIBER processes the transactions. Measuring the execution time of VIBER transactions is based on the time stamps on SWIFT messages.[11] In 2015, in addition to interbank and customer transactions, measurement was extended to credit line modifications and the queries and commands (e.g. transaction cancellation) of participants as well. In the case of sufficient collateral, interbank and customer transactions, the cash leg settlement of securities transactions and the margin calls of ICS intraday clearing are executed in 15 seconds on average. The time requirement of credit line modifications was higher than this (4 minutes), given that the collateral assessment module of the client account

[11] 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).

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. After the introduction of the 10 cycles, the average execution time[12] of a clearing cycle dropped by 30 per cent to 7 minutes compared to the previous period (Chart 16). The significant acceleration can be attributed to the improved performance[13] of the clearing turnover system on the back of the changes implemented and to the fact that the number of transactions cleared in a given cycle has been greatly reduced by the higher cycle frequency. In 2015, each phase of the clearing process was reduced. Determining the collateral required for the execution of the transactions received for the given cycle in VIBER[14] did not take longer than a minute and a half even in the cycle with the highest number of transactions, which implies a 30-second improvement compared to 2014. Following the collection of the collateral, the results related to the clearing of the cycle were available for ICS participants more than 30 seconds earlier, and the receipt of the results did not take longer than 16 minutes even in the cycle with the highest number of transactions. Obviously, the time requirement of these phases depends on the number of transactions processed in the given cycle. The maximum execution time barely exceeded 30 minutes even during the cycle processing the largest number of transactions.

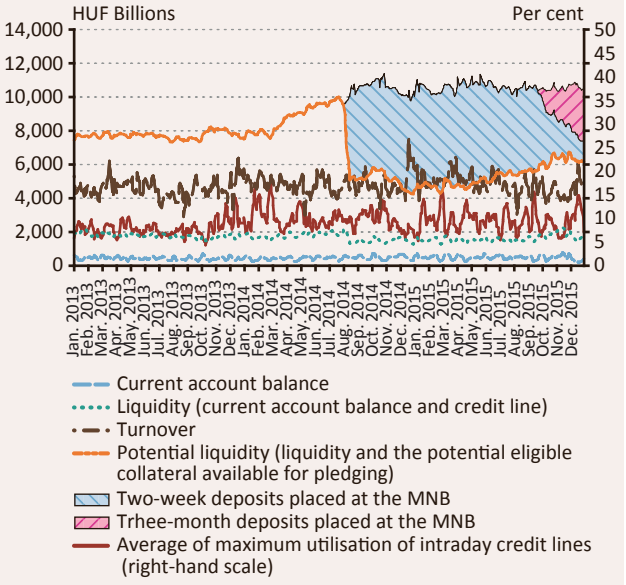
Chart 16
Time requirement of the ICS intraday clearing process after the introduction of higher cycle frequency
(2015)



2.3.2 CLEARING AND SETTLEMENT RISK IN VIBER AND THE ICS

The 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: their available account balance and the intraday credit line provided against their security portfolios pledged to the MNB.

Chart 17
Turnover, current account balance, actual and potential liquidity of VIBER participants, and the maximum utilisation of intraday credit lines (MICL) in the system
(2013–2015)



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

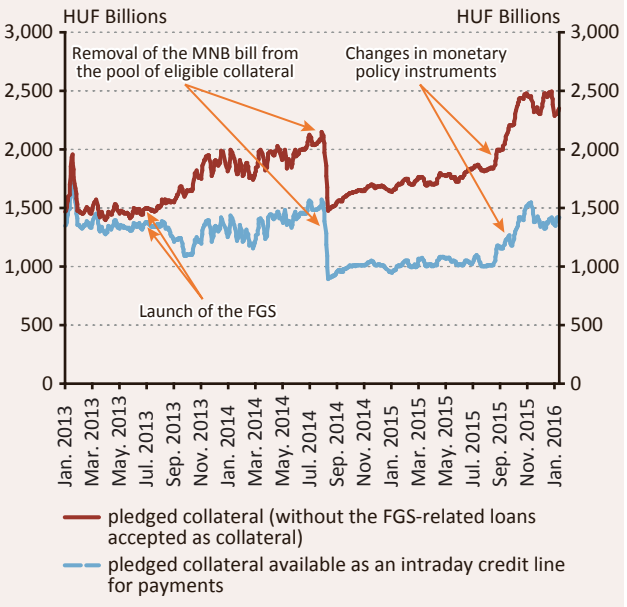
Thanks to the quick and adequate adjustment of the participants of the financial infrastructures to the changing monetary policy instruments of the MNB, there was sufficient liquidity for the execution of payment transactions both at the system level and

[12] The average execution time of a cycle is the duration between the receipt of the last transaction for the given cycle and the bank's receipt of the results.
[13] Compared to the previous 1 million transactions, 3 million transactions can be now settled during a cycle.
[14] 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 on the VIBER accounts of the participants as liquidity.

on an individual bank basis; as a result, clearing and settlement risk did not increase in any of the payment systems. The liquidity positions of payment system participants were shaped by a number of events in 2015, including the transformation of the MNB's monetary policy instruments under the Self-Financing Programme, the modification of the interest rate corridor, the introduction of a fixed, 2 per cent required reserve ratio applicable to all VIBER members, the increase in the number of the ICS intraday clearing cycles and the addition of the forint to CLS. As a continuation of the MNB's Self-Financing Programme, on 23 September 2015 the monetary policy instruments were changed, and the new, three-month deposit became the main monetary policy instrument of the MNB, replacing the previous two-week deposit. At the same time, the MNB introduced a HUF 1,000 billion cap on two-week deposit holdings. As was the case with the two-week deposit, the three-month deposit is not counted among the instruments eligible as central bank collateral; therefore, it still cannot be used for payment purposes. As a result of the fixed, 2 per cent required reserve ratio introduced under the MNB's Self-Financing Programme and applicable to all members as of 1 December 2015, on average, participants now hold a smaller account balance on their payment accounts at the MNB. To offset the reduction, the participants' securities holdings to be pledged as collateral increased in value. This adjustment process led to a continuous increase in the level of potential liquidity[15] until the end of 2015, and as early as the second half of 2015, it already surpassed VIBER turnover.[16] The level of potential liquidity may be raised on a weekly basis by maturing three-month deposits and by the two-week deposits still held in the system, if – instead of being rolled over – they are placed in instruments eligible as central bank collateral. Although both the three-month and the two-week deposit holdings are part of the assets held on participants' balance sheets, they cannot be turned into potential intraday liquidity promptly, and accordingly, these holdings cannot cover an ad-hoc rise in intraday liquidity needs until they mature. The potential liquidity level of participants, including their stock of deposits placed with the MNB, stayed steadily within the range of HUF 10,000–11,000 billion (Chart 17).

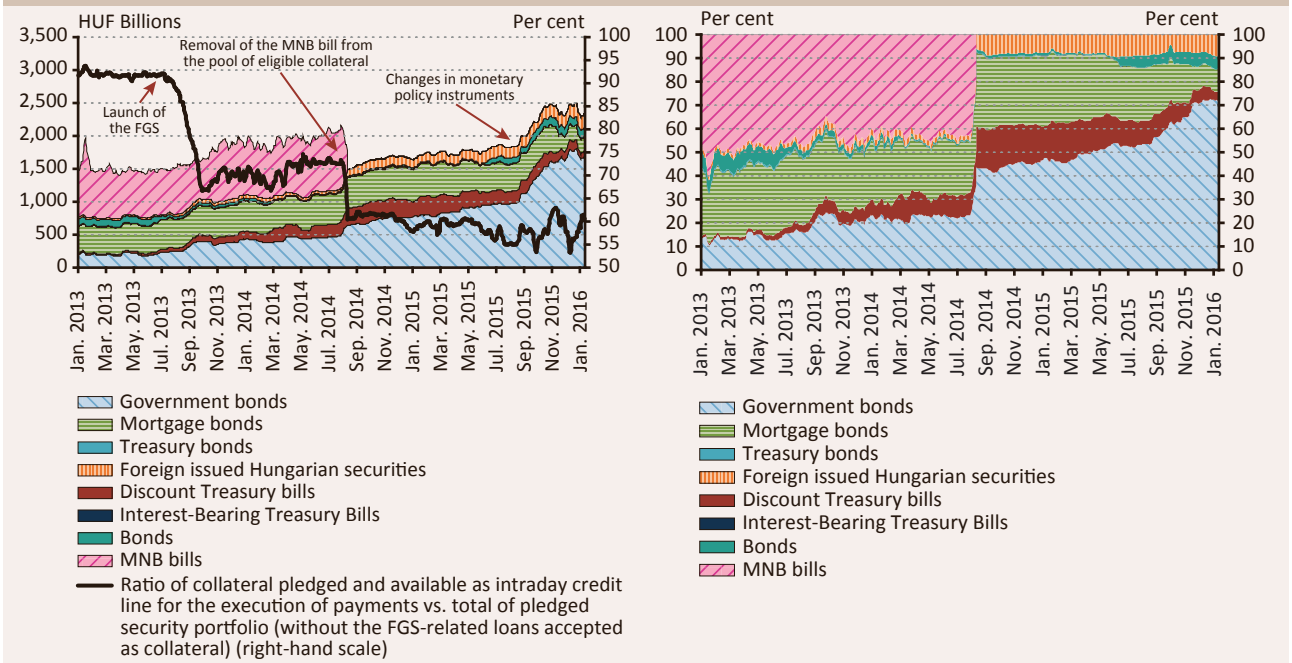
As members of the payment systems raised their securities holdings available as collateral continuously throughout 2015, the collateral available for payment transactions increased compared to the previous year (Chart 18). The pledging of securities peaked after the transformation of monetary policy instruments in September 2015, when participants shifted a substantial portion of the liquidity released from their two-week bills to government bonds. Therefore, by December 2015 the share of government bonds in the pool of available collateral jumped to 72 per cent from 48 per cent recorded at the beginning of the year (Chart 19, right-hand chart). The ratio of collateral available as intraday credit line to total pledged collateral holdings moved in the range of 53–63 per cent throughout 2015[17] (Chart 19, left-hand chart) and, owing to the pledging of securities, by the end of the year the available credit line rose to HUF 1,500 billion from the HUF 1,000 billion recorded at the beginning of 2015, which was sufficient for the smooth execution of VIBER turnover (Chart 18).

Chart 18
Impact of changes in the FGS and the monetary policy instruments on collateral available in the payment systems
(2013–2015)



[15] 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.
[16] By December 2015, the stock of securities available to pledge as additional collateral in the system approached HUF 4,000 billion.
[17] A substantial portion of the pledged securities still constitutes the collateral pledged to secure various loans granted by the MNB (e.g. under the FGS).

Chart 19
Pledged securities and their distribution by type (right-hand chart) and the ratio of credit line to the total pledged security collateral (left-hand chart)
(2013–2015)



As a result of higher cycle frequency in intraday clearing, the more even and efficient distribution of intraday turnover contributed to the further reduction of clearing risk. In 2015, up until the introduction of 10-cycle processing, the debit turnover of intraday clearing accounted for 2–4 per cent of the liquidity available in the system at any given moment on average. As a result of the higher cycle frequency, however, the liquidity available in the system proved to be even more ample, which can be mainly attributed to the steep decline in the value of the transactions processed in the last cycles. Therefore, from September 2015 this ratio dropped below 2 per cent on average. As in previous years, in 2015 the debit-to-liquidity ratio tended to rise primarily on tax payment days and during the traditional year-end spikes in turnover. Before the introduction of the higher cycle frequency the ratio exceeded the average by 10–18 per cent and by 6 per cent after the switchover. It was only in December – which was an unprecedented peak in terms of monthly volume[18] – that, similar to the previous year, the ratio of debits to total liquidity was close to 16 per cent.

2.3.2.2 Liquidity management of VIBER and ICS members

The active, efficient liquidity management of payment system participants, i.e. the adequate intraday allocation of the liquidity needed for the execution of outgoing transactions, continues to be extremely significant for the mitigation of clearing and settlement risk. The extent to which members rely on their account balance and credit line in the execution of payment transactions depends on their respective liquidity management strategy and asset size, the stock of securities on their balance sheets available as eligible collateral and the level of the required reserve ratio.

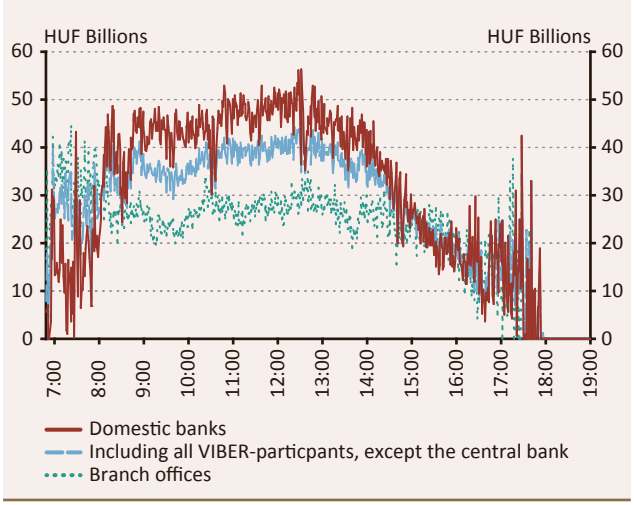
The available account balance is influenced by the level of the reserve ratio; therefore, after the elimination of the optional reserve ratio, participants raised their credit lines for the execution of payment transactions. In 2015, before the introduction of the fixed, 2 per cent reserve ratio, some members chose a higher reserve ratio (typically 4–5 per cent) in the

[18] 31 million transactions were cleared in the system.

optional reserve requirement regime with a view to improving their liquidity position, thereby increasing their account balances. This option was generally preferred by two types of participants: those who have large turnover compared to their balance sheet totals, and those who do not or hardly ever use intraday credit lines.[19] As a result of the fixed, 2 per cent reserve ratio required from December 2015, participants previously opting for a higher reserve ratio now tend to hold a smaller account balance on their payment accounts held with the MNB on average. Since the MNB does not pay interest on the portion of the account balance above the required reserve, holding excess reserves would generate losses for them. The reduced reserve ratio level affected 11 members. Most of them adjusted to the change by raising their respective credit lines, which led to a spike in collateral pledging for intraday credit in December 2015.

Although in 2015 the maximum utilisation of intraday credit lines (MICL)[20] did not change noticeably compared to the previous period, system participants tended to utilise their credit lines in their liquidity management more actively and for longer durations than in the previous year. The MICL is still considered low (6–16 per cent) at systemic level; in fact, it even declined somewhat (by 2 per cent) compared to the previous year (Chart 17). On an individual bank basis, the MICL figures are still widely distributed; in general, banks with high turnover tend to have high MICL values. However, while the MICL values of the 3 participants with the largest turnover range between 45–66 per cent on average annually, more than half of the participants do not or only seldom use their respective intraday credit line. In 2015, the average value of the utilisation of intraday credit lines was up 11 per cent (HUF 26 billion) compared to the previous year. In addition to MICL, valuable information can be gained about banks' liquidity position by analysing the extent to which members utilise their credit lines and the duration of the utilisation during the day. In 2015, the duration of participants' utilisation of their respective credit lines for liquidity purposes rose by 20 minutes on average. It is typically participants with the largest turnover and those with high turnover relative to balance sheet totals which use their credit lines actively during 10–40 per cent of the operating hours of VIBER. Since there was only a negligible increase in this ratio compared to 2014, in their case, the transformation of monetary policy instruments and accelerated FGS disbursements did not prompt a significant change in the use of credit lines. A 90 per cent credit line utilisation rate – which might point to overstretched liquidity management and thus higher clearing and settlement risk – was recorded only for 3 to 12 minutes on average during the day for banks actively using their credit line. This is consistent with the values observed in the previous year. Active recourse to credit lines is primarily characteristic of domestic banks;[21] five of these banks used their credit lines for a duration 6–16 per cent longer than in the previous year. There was no change in the case of active users among the branch offices:[22] the utilisation of their credit lines was similar to last year. In the past year, on a given day, participants used intraday credit lines actively until 1:30 pm and from 5:00 pm until the closing of VIBER on average. The utilisation rate declined gradually in the afternoon hours before activity recovered once again in all groups from 4:00 pm, especially in the last hour preceding the closure of client operating hours. At this point, in addition to setting the end-of-day closing positions, participants also needed to provide liquidity for the execution of the last cycle of the ICS intraday clearing, which

Chart 20
Utilisation of intraday credit lines on a given day based on the VIBER participant's business entity type
(2015)



[19] In 2015, three participants opted for a higher reserve ratio compared to prior years; all of them were counted among members with large turnovers.

[20] 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.

[21] Domestic banks are VIBER participant banks and specialised credit institutions.

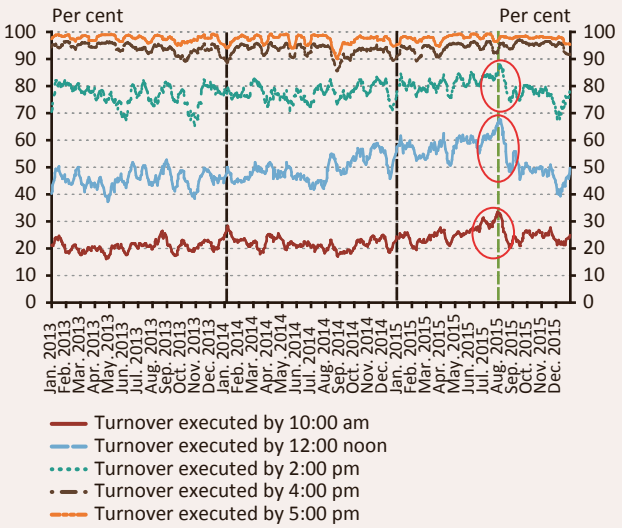
[22] This category includes VIBER participant branch offices inside and outside of the EU.

explains the more active use of their credit lines. In the first hour following the opening of VIBER, branch offices tend to use their credit lines more actively; after this period, utilisation by domestic banks is more prominent until about 3:00 pm. At the same time, the intraday credit utilisation of branch offices is more evenly distributed (Chart 20).

In 2015, there was an increase in the number of cases where banks using their credit lines were forced to use overnight collateralised loans at the closure of VIBER, and the value of these loans also increased significantly. VIBER participants must consider whether they wish to maintain their free overdraft facility even after the closure of VIBER. If they do, they are granted an overnight collateralised loan by the MNB automatically. This could either be a conscious decision, or the result of pressure when the bank is unable to repay the overdraft used during the day despite its best intentions. In addition, in 2015 the change in the structure of the interest rate corridor[23] may also have contributed to the growth in O/N borrowings and their value. As a result of the change, the overnight loan granted by the MNB became cheaper. In 2015, 2.5 times more O/N collateralised loans were granted than in 2014, with a parallel 22 per cent increase in value. Similar to last year, two thirds of the loans were granted towards the end of the month; moreover, on high-turnover tax payment days the group of participants requesting O/N collateralised loans changed significantly in 2015 in the sense that even from the group of the 10 participants generating the largest turnover, more members requested the loan than in the previous year. In 2015, the value of loans granted to participants with the largest turnover rose fivefold, but the average value of the loans increased only by 10.76 per cent in their case.

Due to the extension of the operating hours of VIBER in August, the timing of transactions temporarily shifted to later hours. The transaction timing behaviour of the participants regularly adjusts to the most significant changes affecting liquidity management. From the aspect of transaction timing, one of the most important changes in 2015 was the modification of VIBER's operating hours in August. The opening of the system 1 hour earlier – at 7:00 am instead of 8:00 am – prompted minor realignments. Turnover realignments prompted by the change in the morning opening time are most perceivable during the early hours – 10:00 am, noon and 2:00 pm. As regards afternoon and evening hours, however, the cumulated turnover percentages are roughly consistent with pre-August levels. However, after the introduction of the higher cycle frequency in September 2015, intraday liquidity needs arose even more "spread out" over time; as a result, the timing of payment turnover reverted to the level observed before August in all time periods under review (Chart 21).

Chart 21
Timing of turnover in VIBER (what portion of total daily turnover is completed until a specific point in time)
(2013–2015)



2.3.2.3 Queuing in VIBER, roll-over of transactions between intraday clearing cycles in the ICS due to insufficient liquidity

In 2015, the annual distribution of queuing in VIBER was steady, but in the last third of the year after the transformation of key policy instruments, there was a spike in the number of days when queuing occurred, and the time spent queuing also increased. Nevertheless, this only slightly elevated the level of clearing and settlement risk, as the phenomenon

[23] Previously, the interest rate corridor was +/– 100 basis points wide around the central bank base rate. After the transformation of the monetary policy instruments in September 2015, the interest rate corridor became asymmetric with a lower bound of 125 basis points and an upper bound of 75 basis points. In March 2016, in addition to the key policy rate, the structure of the interest rate corridor changed again. The lower bound remained 125 basis points, but the upper bound was lowered from 75 to 25 basis points. As a result of the changes, the overnight deposit interest rate turned negative, and since the interest rate on the overnight loan provided by the central bank was also reduced, the O/N loan became a much cheaper instrument.

mainly affected participants not managing their credit lines at all. Transactions initiated by a bank will be placed in a queue until sufficient funds become available for execution. Queuing in itself does not necessarily indicate a liquidity problem; it is a natural part of the operation of the RTGS system. The monitoring of queuing is particularly important in understanding the individual liquidity management habits of banks. In 2015, queuing occurred on more than 90 per cent of business days, which means a 30 per cent increase compared to the previous year. On these days, transactions remained in the queue for 1 hour and 20 minutes on average; however, occasionally, on 2 per cent of the business days (6 days), the time spent in queuing jumped to 5–7 hours on average (Chart 22). Partly reflecting the various liquidity management practices of banks, there are significant differences among VIBER participants in terms of the duration of queuing. 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. Of the banks with a high monthly queuing frequency, the transactions of those with higher credit line utilisation figures – and an active liquidity management policy – tended to spend less time – 20–60 minutes per day on average – in the queue. By contrast, queuing took longer – 0.5–3.25 hours on average – for participants who have less active liquidity management and do not take recourse to the credit line available. On some settlement days in 2015, queuing took an extremely long time – over 7–8 hours – for certain participants, as a result of a conscious decision on the part of the participants concerned. As the VIBER turnover of these participants is small, their lengthy queuing did not increase clearing and settlement risk in the system, because they did not give rise to liquidity problem for any other participant. In 2015, there were no gridlocks in VIBER.

Transaction roll-overs between the ICS intraday clearing cycles increased in 2015 both in terms of number and value, primarily because of the delayed adjustment of the banks concerned to the need to provide liquidity on an hourly basis after the change in the frequency of cycles. In 2015, the number of transactions rolled over was up 50 per cent, while the value of these transactions rose by 28 per cent. However, 75 per cent of all roll-overs – which account for 70.8 per cent of the total value of roll-overs –arose in the last third of the year. This period overlaps both with the introduction of the higher cycle frequency and with the transformation of monetary policy instruments. On closer examination, the steep rise in the number of transactions rolled over was less influenced by the transformation of the monetary policy instruments; it can be much more attributed to the insufficient adjustment of the participants concerned to the need of the hourly liquidity provision after the increase in the frequency of cycles. The roll-over of transactions between two cycles does not lead to the violation of the 4-hour rule even after the introduction of the 10-cycle clearing; therefore, participants can take better advantage of this option.[24] Although roll-overs across three cycles only occurred after the cycle increase, in their case, depending on

Chart 22
Average daily duration of queues
(2015)

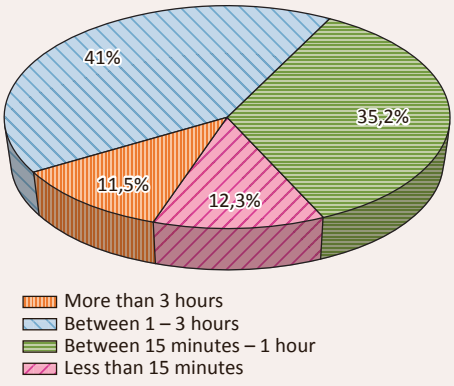
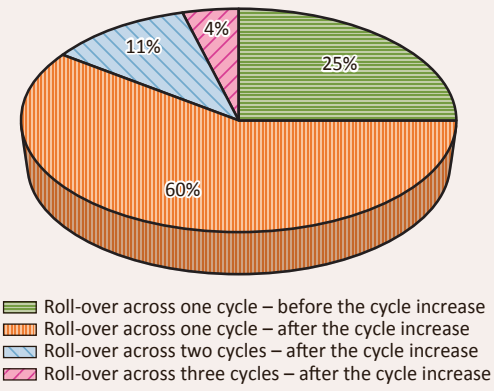


Chart 23
Ratio of roll-overs to total roll-overs before and after the cycle increase
(2015)



[24] The ratio of roll-overs affecting a single cycle rose from 25 per cent to 60 per cent and in the case of roll-overs affecting two cycles from 0 to 11 per cent.

the time of receipt of the transaction, the 4-hour rule may have been violated (Chart 23). Roll-overs between cycles affected 13 banks, but 77 per cent of all roll-overs were related to 5 banks. Most of these banks could have avoided the roll-over by pledging additional securities; thus, in their case, the roll-over clearly resulted from a liquidity management error,[25] despite the fact that they had monitored and used more actively their credit limits since September 2015, following introduction of the mandatory 2 per cent reserve ratio. Of all roll-overs, 18 rolled-over transactions were attributable to actual liquidity shortage. Even if the affected participants had opted for the net funds parameter – the optional liquidity improvement tool provided by the ICS – they would not have had sufficient liquidity to avoid the roll-over.

2.3.3 CLEARING AND SETTLEMENT RISK IN KELER

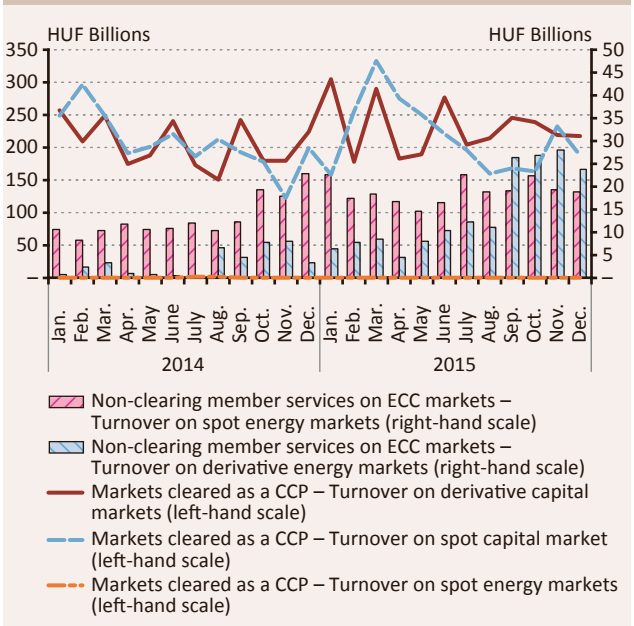
For the most part, the cash leg of securities transactions is still settled in central bank money, which is consistent with international requirements and is associated with moderate settlement risk. KELER matches the transactions of market participants completed outside of the regulated market (OTC transactions) and performs settlement with respect to markets cleared by KELER CCP. At KELER, securities-related transactions may be settled on a DvP,[26] DvD[27] and FoP[28] basis, whereby KELER reduces its credit risk. KELER complies with the PFMI's[29] provisions on international requirements as OTC transactions – which comprise 99 per cent of the turnover without FoP transactions – are settled on a DvP basis and, for the most part, the cash leg of the transaction is executed by using central bank money (96.9 per cent of the total value). Accordingly, settling the cash leg of securities transactions is still associated with moderate settlement risk. In KELER, both the number and value of the transactions submitted on a DvP and on an FoP basis declined compared to 2014.

2.3.4 CLEARING AND SETTLEMENT RISK IN KELER CCP

In 2015, consolidated turnover increased in the markets cleared by KELER CCP. In relation to selected, capital, commodity and gas markets, KELER CCP provides clearing services to the Budapest Stock Exchange (BSE), EuroMTS, the Central Eastern European Gas Exchange (CEEGEX) and FGSZ Natural Gas Transmission Ltd. Apart from the gas market, turnover increased in all markets cleared by the central counterparty compared to 2014. An upturn in market turnover boosts the collateral requirement as well; thus, the netting performed by the central counterparty can mitigate participants' settlement risk in an environment of growing turnover. At the same time, settlement risk intensifies in line with the increase in turnover by nature.

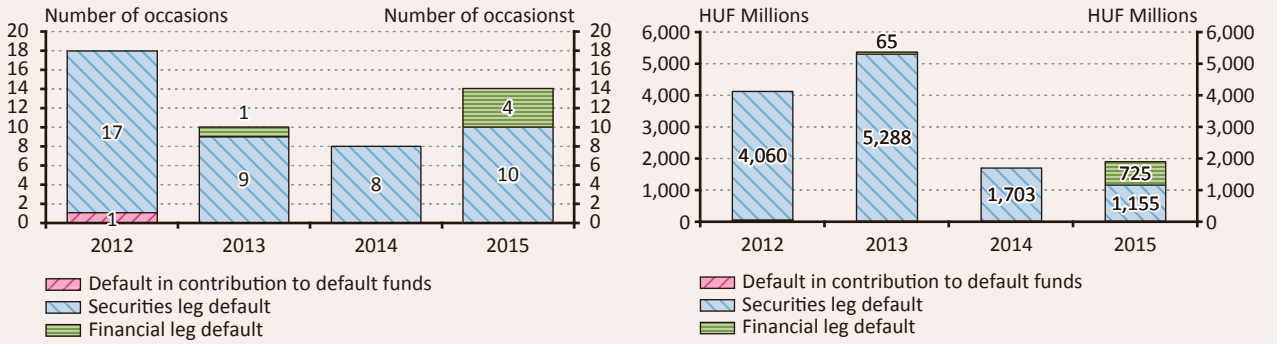
The turnover of the markets cleared as general clearing members increased dynamically in 2015. As an energy market clearing member, KELER CCP provides non-clearing member services for the spot and futures products traded in the markets cleared by the German-based European Commodity Clearing. As regards the spot markets, turnover was up 44.94 per cent, while the turnover of the derivative market rose by 349.46 per cent in 2015 compared to the previous year. The growth can be attributed to the expansion of KELER CCP's non-clearing member

Chart 24
Turnover in the markets cleared by KELER CCP
(2014–2015)



[25] If system participants monitor their liquidity in VIBER on a continuous basis and realise that they do not have sufficient liquidity for the execution of the ICS cycle, they have an opportunity to increase their liquidity by pledging additional collateral during the day, provided that they have sufficient securities on their balance sheets to pledge.
[26] Delivery versus Payment (see: Glossary)
[27] Delivery versus Delivery (see: Glossary).
[28] Free of Payment – (see: Glossary).
[29] Principles of Financial Market Infrastructure.

Chart 25
Defaults in the markets cleared (guaranteed) by KELER CCP
(2012–2015)



activity in the energy market. The value of derivative (futures) trading grew almost 3.5-fold and since this was accompanied by an increase in the value of the open contract stock,[30] the credit risk of KELER CCP also increased (Chart 24).

In 2015, KELER CCP modified its risk management methodology on several occasions. Pursuant to the provisions of EMIR and PFMI, KELER CCP is required to review all documents and models affecting risk management on an annual basis. As in previous years, KELER CCP completed the review in 2015 as well, and the findings were presented to the Risk Management Committee of KELER CCP in all cases.

In the wake of the broker defaults at the beginning of the year, defaults in the markets cleared by KELER CCP rose both in terms of number and aggregate value compared to 2014. Thanks to efficient risk management rules, however, the defaults did not spill over to other market participants. In the case of the markets cleared by KELER CCP, the fundamental goal is to execute all transactions received. To that end, the central counterparty operates a clearing membership and a guarantee system. If a clearing member has insufficient funds or securities to settle a transaction when it becomes due, KELER CCP's default management procedure is activated. In this procedure, the central counterparty makes arrangements to suspend the trading license of the defaulting clearing member and begins collecting the available collateral. Depending on the nature of the transaction, the default can be a financial default or a securities leg default. In 2015, there were fourteen (mainly securities leg) defaults, amounting to a total value of HUF 1,880 million. These failures were coupled with emergency measures on one occasion. The defaults affected seven clearing members and four markets. Overall, the number of defaults was 75 per cent higher than in 2014, stemming from financial defaults related to the broker defaults in the first quarter and from insufficient securities leg liquidity in the second half of the year. In 2015, the total value of defaults was up 10.3 per cent compared to the previous year, but it was still far lower than the value recorded in the years preceding 2014.[31] Evidently, without the failures attributable to the broker defaults, the value of defaults in 2015 would have been far lower than in the previous three years (Chart 25). Nevertheless, thanks to the prudent risk management rules of KELER CCP, the financial defaults were managed without any effects on the capital market, without spilling over to other market participants, and the central counterparty did not sustain any losses. There were no defaults in the gas and the energy market.

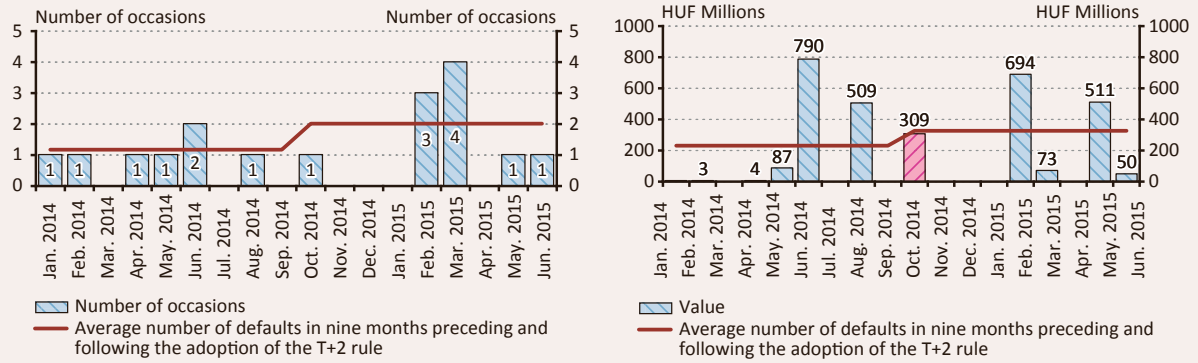
[30] In the case of futures products, the value of yet unclosed positions.
[31] The total value of defaults was HUF 1,703 million in 2014, HUF 5,353 million in 2013 and HUF 4,095 million in 2013.

Box 2

Correlation between the shortening of settlement periods and defaults

Clearing and settlement risks in the markets cleared by KELER CCP were not exacerbated even by the shorter settlement deadline for domestic and foreign securities trading. In line with European securities markets, pursuant to the T+2 rule adopted on 6 October 2014, spot securities contracts concluded in the Equity Segment of the Budapest Stock Exchange and on the BETa market[32] must be settled no later than the second business day (T+2) following the trading day, instead of the previously stipulated third business day (T+3).[33] The introduction of the rule is related to harmonisation efforts concerning the securities clearing and settlement market, which assign a higher priority to the simplification of cross-border securities transactions and to strengthening market competition between the central securities depositories operating in the European Union. In addition, the standardisation of the settlement period was a prerequisite for the 2015 launch of the TARGET2-Securities (T2S) pan-European securities settlement platform. At the same time, before the adoption of the rule, there had been concerns that the shorter settlement period may increase the partner risk of the affected securities transactions, leaving less time for obtaining the funds or securities required for settling the transaction. After analysing the data for the nine months preceding and following adoption of the new rule, it was found that performance on the second settlement day following the trading day expedited the settlement of securities transactions, while the reduction of the period available for settling the transactions – as expected – had no significant impact on the number and value of defaults. Therefore, the new rule did not increase the clearing and settlement risk of the infrastructure. Although there was a rise in the average number and value of defaults after 6 October 2014, the reason for the increase is not related to the adoption of the rule, given that the first major default occurred only in the fourth month[34] following migration, when one of the brokerage firms affected by the broker defaults was unable to discharge its obligations due to liquidity problems and the suspension of its operating license (Chart 26). Although the events related to the broker defaults largely contributed to the elevated default values following 6 October 2014, migration to the T+2 rule had no bearing on the events.

Chart 26
Number and value of defaulted securities transactions before and after migration to the T+2 rule



In addition to stock exchange securities transactions, the settlement cycle of the Trading Platform[35] used for trades related to natural gas and gas transportation capacities was also shortened in 2015, which also did not generate an increase in clearing and settlement risk. For risk management purposes, KELER CCP reduced the settlement cycle of

[32] On the BETa Market of the Budapest Stock Exchange, investors have an opportunity to trade in foreign equity. The trading is performed in forint; thus access is given to the shares of numerous European large corporations issued in foreign currency without the costs of foreign exchange conversions.

[33] Pursuant to Regulation (EU) No 909/2014 of the European Parliament and of the Council (CSDR), in the case of transactions in transferable securities executed on trading venues, the settlement date shall be no later than on the second business day after the trading takes place. Before the adoption of the regulation, transactions executed in the Equity Segment of the Budapest Stock Exchange and on the BETa market had been settled on the third business day following the trade (T+3 rule).

[34] February 2015

[35] The previous name of the Trading Platform was “Balancing Platform”.

the Trading Platform from 15 days to 5 days. Consequently, as of 1 April 2015 participants have 5 calendar days to settle their cumulated monthly net purchase price payment obligations, instead of the previous 15 calendar days.[36] The measure greatly contributed to mitigating the risks of KELER CCP, as the tighter settlement deadline allows participants' insolvency to be detected earlier and thus insolvent member may be prevented from further trading within a shorter timeframe. At the same time, as is the case with stock exchange securities transactions, the shortening of the duration of the settlement cycle may increase the partner risk associated with transactions executed on the Trading Platform, as the application of the earlier 15-day settlement cycle leaves more room for participants to obtain the required liquidity, thereby supporting the liquidity planning of members in buyer positions. In 2015, there were no defaults in the case of the Trading Platform; in other words, the reduction of the duration of the settlement cycle did not increase the clearing and settlement risk of the trades concluded on the Platform.

In 2015, there was a need for intra-day clearing on three occasions, with two of these resulting from the extreme exchange rate volatility prompted by the decision of the Swiss central bank. KELER CCP calculates technical prices for all instruments relying on data related to trades and offers received in real time. The calculation of real-time technical prices, as well as real-time position management and assessment enable KELER CCP to order, in case of a pre-defined price movement, intra-day clearing for risk management purposes to reduce the probability of defaults. In 2015, it applied intra-day clearing in the case of three instruments. On 15 January, because of the unexpected elimination of the exchange rate cap on the Swiss franc, the prices of CHF/HUF and EUR/CHF maturities on the financial futures market were not consistent with market prices; therefore, based on the theoretical delivery prices intra-day clearing was ordered. In addition, in the case of the EUR/USD exchange rate, due to the long weekend of the 20 August 2015 national holiday, base prices reflected the closing status on 19 August. However, global events[37] gave rise to significant changes during the long weekend, and prices on 24 August were drastically different from those recorded on 19 August. As a result, the price movement exceeded the clearing limit in EUR/USD and therefore on 24 August 2015 intra-day clearing was ordered.

Due to the violation of trading limits, 2015 saw an increase in the number of calls for additional financial collateral. At the same time – as was the case in 2014 – there was no need to impose supplementary margin. In guaranteed capital markets, various mechanisms have been put in place for managing the clearing and settlement risks stemming from the insolvency of a clearing member. If necessary, the clearing right of the affected clearing member may be suspended, while in less extreme cases the participant may be ordered to provide additional financial collateral and to pay supplementary margin. In 2015, there were no instances of supplementary margin being imposed in the capital market due to clearing members' non-compliance with applicable capital requirements. However, additional financial collateral was ordered on eight occasions in 2015, which exceeds the three cases recorded in 2014 by a large margin. Of the additional financial collateral imposed, six cases were related to the stock exchange derivatives market and two cases to the equity segment of the spot market. The vast majority of the measures were required because of the participants' violation of the market position limit and the individual capital position limit.[38] Compared to 2014, in 2015 the number of defaults rose significantly in the capital markets; however, the increased risks did not warrant the imposition of additional financial collateral due to repeated default. Additional financial

[36] The cycle in which the cumulated monthly net purchase price payment obligation is to be settled begins on the first settlement date of the following month.

[37] The considerable weakening of USD was attributable to general expectations about the slowdown of the Chinese economy, the sharp decline in the exchange rate induced by the panic sentiment in the Chinese equity markets and by the pricing-out effects of the postponement of the anticipated Fed interest rate hike from September to December 2015.

[38] Market position limit: In the case of capital markets, if a clearing member's own net market position, that of its principals, non-clearing members or an individual principal reaches or exceeds 5 per cent of the open contract stock for the product concerned, or if the contract value of the futures net market position of a CEEGEX Clearing Member reaches or exceeds 20 per cent of total market open interest, KELER CCP is entitled to impose additional financial collateral. Capital position limit: For the derivative positions of derivative clearing members and CEEGEX physical futures clearing members KELER CCP applies capital position limits as specified in its General Business Rules. If the clearing member reaches or exceeds the limit that can be obtained against the deposit of additional financial collateral, KELER CCP may suspend the clearing right of the clearing member.

collateral and supplementary margin were provided as required in every case.

Clearing and settlement risk in gas markets decreased in 2015 compared to the previous year. As is the case with guaranteed capital markets, in energy markets the central counterparty is also entitled to impose additional financial collateral and supplementary margin requirements or suspend the clearing right of the clearing member. In the gas markets, KELER CCP ordered four clearing members to pay supplementary margin for violation of the capital requirement on four occasions in 2015, which points to a moderation in the related clearing and settlement risks compared to the previous year, as similar measures were taken on five occasions in 2014. In addition to these supplementary margins, additional financial collateral was imposed in one case in 2015 due to the participant's failure to comply with its reporting obligation. This also implies that risks declined compared to 2014, when two such cases occurred.

2.3.5 SYSTEM OPERATIONAL INTERDEPENDENCY RISK

As a result of operating hour extensions, system operational interdependency risk increased slightly in 2015 compared to the previous year, but owing to the robust operation of the systems, it remained at a low level throughout 2015. Monitoring system operational interdependence risks in the domestic financial market infrastructure (VIBER, ICS and the securities clearing and settlement system) is important because fundamental liquidity-related interdependencies between the systems may give rise to contagion. A problem arising in one system might spill over to the rest of the systems, as in the case of domestic payment transactions the various interdependent steps in the clearing and settlement process are sometimes performed by different financial market infrastructures. In addition, the cash leg liquidity of participants relies on the same collateral in the systems, while the pledged security collateral ensuring the liquidity of the payment systems is managed by KELER Central Securities Depository. In VIBER, system operational interdependency risk remained unchanged on the side of the ICS in 2015 compared to the previous year, as GIRO requested the extension of operating hours upon the request of ICS participants about as many times as in 2014. System operational interdependency risk in VIBER increased on KELER's side, due to an increase in the number of requested operating hours extensions due to a technical problem at KELER. Moreover, on one occasion in 2015, KELER was unable to send SWIFT messages for 128 minutes; consequently, it was also unable to send DVP transactions and credit line modification messages during this period.

2.4 Comprehensive oversight assessments in 2015

Based on the comprehensive oversight assessments, the operation of the Hungarian financial market infrastructures was safe, efficient and transparent in the past two years, thereby supporting the operation of the domestic money and capital market and hence, strengthening financial stability. For the fifth time in 2015, comprehensive oversight assessments were conducted for all four overseen systems. In line with international procedures, the assessment began with a questionnaire-based survey with a focus on self-assessment, internal interviews with systems operators and evaluation of the supplied information, data and findings of internal audits. The comprehensive assessments are consistent with international practice. Indeed, in 2014 the assessment methodology was updated to adopt the international requirements for financial market infrastructures (Principles for Financial Market Infrastructures [PFMI, BIS-IOSCO]). Since the modification of the international methodology increased the number of principles and key considerations examined in the assessment, the assessment of 2015 does not exactly correspond to that performed in 2012. In respect of the overseen systems, in most cases the assessment rating of each principle (e.g. operational risk, governance, legal basis, efficiency and effectiveness) was assigned as broadly observed or observed.[39] Based on the assessments, in the MNB's opinion there is room for improvement in all systems, especially as it relates to comprehensive management of risks (including comprehensive risk assessment and planning), updating system rules and procedures, cost calculation methodology and operational risk. As regards the latter, areas to improve include authorisation management, key-person risk, change management and business continuity. In the context of the assessments, the MNB – as the overseer – formulated recommendations for the overseen systems aimed at the further improvement of operational reliability and efficiency. Based on the recommendations, systems operators have drawn up action plans and their implementation is in progress.

[39] 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.

2.5 Findings of payment inspections

According to the on-site inspections conducted in 2015, compliance was generally observed at the credit institutions inspected, but a number of violations were detected which affected a broad range of customers. By reinforcing the compliance of credit institutions and other payment service providers with regulations, payment inspections contribute to the reliable and compliant operation of the financial intermediary system, the predictability of payment processes for customers, and hence, the efficient delivery of services to customers. Similar to the previous year, the MNB conducted scheduled inspections at 22 credit institutions in 2015, verifying compliance with the provisions of the Act on Payment Services[40] and of the MNB Decree.[41] The MNB conducted scheduled inspections at four credit institutions with significant payment turnover, at three credit institutions with smaller turnover (including the branch of a European Union credit institution) and, within the sector of cooperative credit institutions, at 15 cooperative banks with a sizeable turnover. The inspections found violations of legal regulations in 176 cases. Each inspection was concluded with a call for measures, and in consideration of the severity of the violations identified, the MNB imposed fines on eight credit institutions amounting to HUF 90.3 million in total. This amount was augmented by an additional amount of HUF 24.2 million in fines imposed in the context of inspections carried over from 2014 and by fines amounting to HUF 4.2 million levied on three credit institutions in relation to inadequate implementation of the measures prescribed in the context of inspections performed in 2014. As a result, the total fines imposed by the MNB in 2015 amounted to HUF 118.9 million (Table 3).

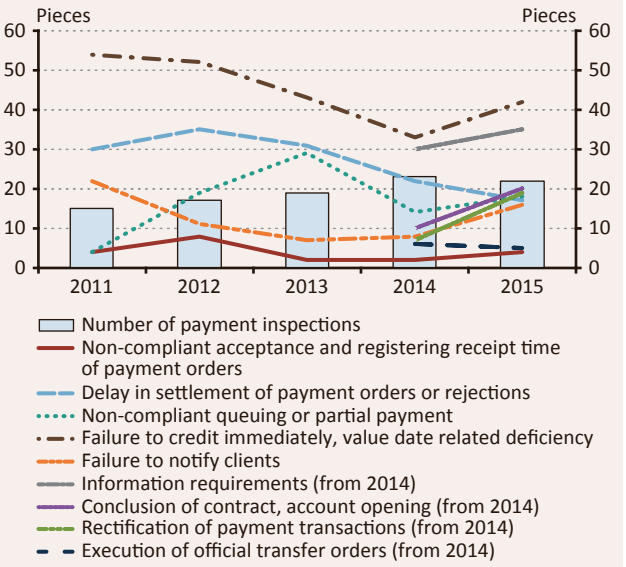
Table 3
Inspections conducted by the MNB in numbers
(2011–2015)

		2011	2012	2013	2014	2015
Number of payment inspections	Bank	9	8	11	9	7
	Cooperative credit institution	6	9	8	13	15
	Payment institution	—	—	—	1	—
Number of findings		134	125	118	174	176
Number of measures		78	113	107	122	99
Number of fines	Bank	2	—	2	2	10
	Cooperative credit institution	5	4	4	6	7
	Payment institution	—	—	—	0	0
	Total:	**7**	**4**	**6**	**8**	**17**
Amount of fines (in million HUF)	Bank	17	—	3,2	35	103,5
	Cooperative credit institution	4,4	3,2	20,4	27,5	15,2
	Payment institution	—	—	—	0	0
	Total:	**21,4**	**3,2**	**23,6**	**62,5**	**118,7**

[40] Act LXXXV of 2009 on the Pursuit of the Business of Payment Services.
[41] MNB Decree No 18/2009 (VIII. 6.) on payment services activities.

The most frequent infringements involved the violation of the Act on Payment Services in respect of the provision of prior and follow-up information, and of the MNB Decree in respect of making the amount of the payment transaction available to the beneficiary. Pursuant to the provisions of the Act on Payment Services, customers must receive information on the fees and charges payable by the customer. The fees announced must be presented, in an itemised form, in the subsequent information (account statement) sent to customers, provided that there have been such transactions. The inspections revealed that credit institutions failed to meet the requirement of providing prior and subsequent information to customers in many cases. Another frequent error was that the payment account was opened in the absence of the documents prescribed by law. After improving in the previous year, failure to credit immediately and value date related deficiency were on the rise again, and in 2015 they remained the most frequent violations in respect of the MNB Decree. Since the relevant provisions have been in effect for a long period of time, the MNB continues to impose tighter sanctions in the case of such violations (Chart 27).

Chart 27
Non-compliance cases in payments
(2011–2015)



3 Developments in Hungarian and international regulation affecting payments and financial infrastructures in Hungary

Regulated and supervised payment services provided to customers contribute to improving consumer confidence and hence promote the further advancement of electronic payment services. This chapter outlines the Hungarian and international regulatory developments affecting payments and financial infrastructures in Hungary. It summarises progress made in the transposition of the Payment Accounts Directive, calls attention to preparations for the SEPA End-Date Regulation, presents the most important changes of the renewed Payment Services Directive, discusses the changes affecting commercial cards pursuant to the European Union Regulation on interchange fees for card-based payment transactions and the regulatory amendments prompted by the establishment of national utility services.

3.1 Progress in the transposition of the Payment Accounts Directive

Although details of the Hungarian regulation serving the transposition of the Payment Accounts Directive[42] are not yet available, a provisional national list of the most representative services linked to a payment account and subject to a fee has been prepared. Moreover, the EBA has already commenced negotiations with regard to the Union-level standardised terms of glossary, the fee information document and the statement of fees. Upon transposition of the Payment Accounts Directive, pursuant to the authorisations to be granted in the Act on Credit Institutions[43] and in the Act on Payment Services,[44] the provisions of the Directive will be incorporated into government decrees. The government decrees to be drafted by the Ministry for National Economy will define the detailed rules of payment accounts with basic features, payment account switching and the information to be provided with respect to the fees related to payment accounts held for consumers.[45] In accordance with the Payment Accounts Directive and with the involvement of payment service providers and consumer protection organisations, by 18 September 2015 the MNB had prepared a provisional national list of the most representative services linked to a payment account and subject to a fee. The list is composed of 20 items. According to the provisional national lists drafted by the Member States, EBA is to propose standardised Union-level terms and definitions (i.e. a glossary), which will assist consumers in understanding the content of individual services. Simultaneously, EBA has commenced developing the technical standards regarding the fee information document and the statement of fees. Prior to the conclusion of the payment account framework contract, the fee information document is expected to provide clear and understandable, ex ante information to consumers regarding the fees to be charged for the service. Once the service linked to the payment account is being used, service providers are required to provide a statement of fees free of charge and at least annually, to inform consumers of all the fees charged in the relevant period, using the standardised terminology. EBA has already commenced consultations regarding these documents. The development of the so-called comparison website operated by the MNB is in progress to ensure, in a consistent format, comparability of the fees linked to the payment accounts charged by each payment service provider, in the standardised terminology mentioned above.

[42] 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.
[43] Act CCXXXVII of 2013 on Credit Institutions and Financial Enterprises.
[44] Act LXXXV of 2009 on Providing Payment Services.
[45] As of the date of submission of this Report, the details of the scheduled regulation were not available.

3.2 Preparation for SEPA end-date

By 31 October 2016, both payment service providers operating in Hungary and payment service users must comply with the EU requirements for credit transfers and direct debits in euro. The requirements set out in the SEPA End-Date Regulation aim to enable customers of payment service providers to execute euro payment transactions with safety, speed and efficiency similar to domestic payments. SEPA is based on common technical standards and payment schemes, of which SEPA credit transfer (SCT) was introduced in 2008 and SEPA direct debit (SDD) in 2009. Under the Regulation, euro area Member States were expected to complete migration to the common payment schemes by August 2014. Non-euro area countries are required to complete the migration later, by the end of October 2016.

Importantly, full migration to common European payment schemes not only affects payment service providers: payment service users, and in particular corporate customers generating the highest euro turnover, must also be involved in the effort. From the end-date, credit transfers and direct debits in euro must be executed in accordance with the common standards and technical requirements (ISO 20022 XML) of the SEPA End-Date Regulation. One of the most challenging rules of the Regulation states that after the deadline, payment service providers must ensure that when a payment service user – which is not a consumer or a microenterprise (a corporation or public authority) – initiates or receives euro-denominated, individual credit transfers or individual direct debits bundled together for transmission, only SEPA-formatted messages can be used. Payment transactions must be transmitted from end to end according to SEPA standards, and payment service providers' are only allowed to offer their customers conversion services to SEPA standards with limitations, separately of the payment chain and subject to specific conditions.

Payment service providers must also ensure that a payment order submitted in euro is also executed according to the international bank account number (IBAN) specified in the order. Until now, customers were required to submit these types of payment orders to their payment service providers together with IBAN and the bank identifier code (BIC). Pursuant to the End-Date Regulation, as of the end-date, in non-euro area countries, payment service providers cannot require their customers during payment transactions to provide the BIC of the payer's or the payee's bank for the execution of the transaction. This also poses a challenge for payment service providers, considering that at present they ensure the routing of payment orders to the payment service provider of the payee on the basis of the BIC code.

Box 3
The bank identifier code (BIC) and the international bank account number (IBAN)

The BIC (business identifier code) is a standard approved by the International Organisation for Standardisation for the identification of banks. The standard specifies the structure and elements of the identifier code for the automation of international payments. The code consists of 8 or 11 digits and its purpose is to transmit international payment orders to banks.

IBAN (international bank account number) is the international identifier of payment accounts. It unambiguously identifies an individual payment account, the elements of which are specified by the International Organisation for Standardisation (ISO). In Hungary, it is a series of numbers containing 28 characters, and it is generated in accordance with Annex No 1 to Decree No 18/2009 (VIII. 6.) of the Governor of the Central Bank on the Execution of Payment Transactions as follows:

- the first two digits comprise the country code of Hungary in accordance with ISO 3166: HU;
- the third and fourth digits comprise the check digit, for which the algorithm is laid down in the European Committee for Banking Standards (ECBS) under the procedures relating to the creation of the IBAN;

- digits 5–28 comprise the domestic payment account number (if the payment account number contains only 16 characters, the last 8 digits of the IBAN shall all be zeros).

Characters 5–28 of the IBAN contains the domestic payment account number which is created, in accordance with the same Annex of the Decree, as follows:

- the first eight characters comprise the routing code; the first three digits of the routing code comprise the credit institution identification code (issued by the MNB at the request of the payment service provider), indicating the account holding payment service provider, where the next four digits indicate the branch or the location of the payment account of the payment service provider. The eighth digit is a check digit;
- digits 9–16 or 9–24 comprise the identification number of the payment account. The check digit is the 16th digit if the full length of the payment account number is 16 characters or the 24th digit if the account number contains 24 characters. If the account number contains 24 digits, the 16th digit may be freely used;
- the check digits verify the preceding digits and are calculated on the basis of a special algorithm specified by the Decree.

In order to ensure timely migration, the MNB continuously monitors the progress of SEPA preparation. In 2015, a SEPA migration working group was set up within the framework of the Hungarian Banking Association, which published an information booklet[46] on SEPA migration for payment service providers and presented its contents at the SEPA Forum. It also approved a communication plan for raising awareness among stakeholders. In cooperation with the MNB, the Banking Association inquired about the progress of payment service providers in a questionnaire-based survey.

Although the progress of Hungarian payment service providers is adequate, additional efforts are needed to ensure full migration of payment system participants to the execution of euro-denominated payment transactions according to SEPA requirements. Most banks with the largest payment turnover began preparations for the comprehensive application of SEPA payment requirements even before 2016, while the rest of the payment service providers commenced the process in the first or second quarter of 2016. According to the data supplies of payment service providers requested by the MNB, at the end of 2015 75 per cent of the euro-denominated credit transfers processed by Hungarian banks were performed in accordance with SEPA requirements (Chart 28). Based on the MNB's estimates, the current status of the migration is even more favourable – 85 per cent for SEPA credit transfers at the end of 2015 – once large-value (e.g. TARGET2) and other, euro-denominated credit transfers affecting non-European countries are excluded from the statistics (where transmission as per SEPA requirements is technically unfeasible in any case). As only one Hungarian payment service provider has joined the SEPA direct debit (SDD) scheme so far, the MNB does not publish data in this regard.

Chart 28
Ratio of SEPA credit transfers (SCT) to total euro credit transfers[47]
(2011–2015)

[46] http://www.bankszovetseg.hu/hirek-aktualitasok/2016-november-1-tol-egyseges-euro-fizetesi-szabalyok-es-szabvanyok-az-unio-minden-tagallamaban-3691

[47] While the MNB requested data supplies from payment service providers regarding the application of SEPA payment methods semi-annually until the end of 2013, from 2014 the data supply is to be provided on a quarterly basis.

3.3 Key changes in the renewed Payment Services Directive

Having assessed the application and results of the Payment Services Directive adopted in 2007, European Union legislators decided to elaborate a directive which is more aligned with contemporary requirements and trends as well as encourages the use of innovative, electronic payment solutions. Entering into force in 2018, the amendments of Hungarian legislation in accordance with the renewed Payment Services Directive promulgated in December 2015 establish a legal framework for the market entry of enterprises providing innovative electronic services, strictly regulate the protection of customers' personalised security credentials used in electronic payment transactions, and introduce a number of provisions for extending and strengthening the existing rights of consumers.

The renewed Payment Services Directive provides the means for the provision of innovative electronic services in a regulated and supervised framework. In recent years, several new enterprises providing payment-related services have emerged: payment initiation service providers, through which a customer shopping online can submit to its account-servicing payment service provider payment orders to the credit of the merchant's account, and account information service providers which, by offering an online inquiry option, simultaneously display the account activity on all of the account holder's payment accounts. Both of these new services require the use of the customers' personal security credentials, which – given the current absence of the relevant regulations – poses severe security risks and raises serious consumer protection questions especially in relation to information technology security and responsibility. With that in mind, the new Directive is also applicable to these services and permits their provision only to licensed and supervised payment institutions, subject to adequate IT security, customer information and responsibility requirements.

With a view to improving the safety and reliability of electronic payment services and consumers' confidence in the use of such services, the new Directive imposes tight security, risk management and authentication requirements on payment service providers. Payment service providers are required to develop and maintain a framework for risk mitigation measures, control mechanisms and incident management procedures designed to manage and safeguard against operational and security risks related to the payment services provided. In order to prevent fraud, unauthorised access to customers' personalised security credentials and financial data as well as their fraudulent use, payment service providers are required to use strong customer authentication (see Chapter 4.3) when customers access their payment accounts online or initiate payment transactions electronically.

The new Payment Services Directive also introduces provisions strengthening and extending consumers' rights and reducing their liabilities. One of the most important changes is that the scope of the new Directive is extended to payment transactions in all currencies[48] and, in the case of payment transactions involving countries outside of the EEA, to the part of the given payment transaction that is carried out within the EEA. A favourable change affecting consumers is the extension of the right to terminate the framework contract free of charge if the framework contract is in force for at least 6 months instead of the previous 12, thereby facilitating switching between payment service providers. Cardholder consumers may be obliged to bear the losses relating to any unauthorised payment transactions resulting from the use of a lost or stolen payment instrument up to a maximum of EUR 50 instead of the existing EUR 150. When the exact amount of a card-based payment transaction is not known, the account servicing payment service provider may block funds on the cardholder's payment account only if the cardholder has given consent to the exact amount of the funds to be blocked and those funds shall be released without undue delay upon the actual execution of payment. Provisions of the new Payment Services Directive must be transposed into the national legislation of Member States by no later than 13 January 2018.

[48] The rule is not applicable to some provisions that are explicitly related to payment transactions executed within the European Economic Area (EEA) in the currency of a EEA Member State (e.g. certain execution times).

3.4 Additional regulatory changes affecting the execution of payments

Maintaining the higher interchange fees applicable to commercial cards is only warranted over the long term if it makes a considerable contribution increasing commercial card turnover and if the growth rate of company card turnover exceeds the growth rate of retail card turnover by a large margin. From the beginning of 2016, the Hungarian regulation effective from early 2014 is no longer applicable to commercial cards. Consequently, card companies or payment service providers are now free to charge any amount of interchange fees in this card category, which means that the interchange fees applicable to commercial cards may rise several-fold in comparison to those applied to retail cards. This practice, in turn, may raise the costs of merchants accepting card payments irrespective of the fact that the turnover of company card purchases accounted for only 8 per cent of the value of total domestic purchases in 2015. It should be stressed that under European regulations, neither the card schemes, nor payment service providers can oblige merchants to accept the cards operating with unregulated interchange fees; accordingly, Hungarian merchants may also refuse to accept commercial cards. Although a mass rejection of commercial cards cannot be expected initially, in the long run, once merchants begin to perceive the losses generated by these cards, card rejections may become more widespread, which would be detrimental to the future of the domestic payment card market. Therefore, the commercial card market should be closely monitored to identify the effects of the regulatory change as soon as possible.

If the entity of the public utility service provider changes after the national public utility service is put in place, payers will not need to submit a new mandate for direct debit or modify the old mandate. In 2015, parallel to the revocation of the universal service licenses of a number of utility companies involved in gas supply services, the Hungarian Energy and Public Utility Regulatory Authority appointed another company – under the professional control of Első Nemzeti Közműszolgáltató Zrt. – to service the customers of these providers. Similar changes can be expected in the future in other public utility sectors as well. Since a large portion of the customers constituting the new customer base of the national public utility service had used direct debit to pay the old service providers for public utilities, after the switchover of service providers a significant number of customers would have had to modify their mandates for direct debit without a change in legislation. For a smooth provider switchover, several regulations[49] have been amended to ensure that the previously submitted direct debit mandates remain effective irrespective of the change in beneficiary service provider.

[49] Act LXXXV of 2009 on the Provision of Payment Services and other sectoral laws.

4 Ongoing and upcoming developments of the financial infrastructure

Developments affecting the payment and settlement systems facilitate the efficient, quick and safe execution of payment transactions. Developments scheduled in the area of domestic payment transactions may set in motion a dimensional shift within the next few years: in 2015 work commenced on developing the concept for an instant payment system in Hungary. The developments and related innovative payment solutions will soon offer electronic alternatives to cash payment at a growing number of locations in numerous payment situations, improving the efficiency of the execution of payments society-wide and hence, increasing the level of development of the economy.

4.1 Possibilities of implementing an instant payment system

The further improvement of the Hungarian payment system and the competitiveness of the Hungarian economy may be bolstered by implementing a payment system that works every day of the year, twenty-four hours a day and provides the means for the execution of the vast majority of payment transactions within seconds. The new instant payment system will enable domestic banks to offer innovative payment solutions to a wide range of customers, while with open access to the fast and modern infrastructure, new, non-bank participants entering the payments market will be capable of creating payment services competing with banking products. By using a system that can be considered advanced even by international standards, initiating electronic payment transactions will become quick and simple for a broad range of customers. As a result, electronic payment will become possible in numerous situations where currently there is no real alternative to cash payment; in addition, new technical solutions will become widespread even in the Hungarian payments market much faster than before, paving the way to innovative payment solutions (such as mobile payment services). In some situations, already existing electronic payment solutions – such as electronic payment solutions currently operating with the involvement of international card brands – may also be replaced by services built on the new system; moreover, a vast array of payment transactions linked to the state may become electronised easily at low cost.

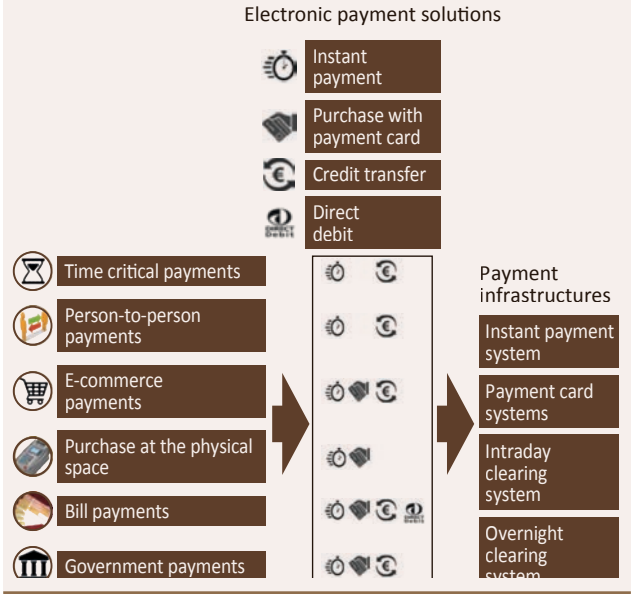
The currently used electronic payment solutions can typically only be applied in a limited number of payment situations; extending their scope to additional payment situations can only be generally achieved by increasing the complexity of the infrastructure. This is because the operational logic of basic electronic payment methods[50] is built on limited communication potentials and as such, it barely takes advantage of the modern communication and data transmission services which have become broadly available at low cost in recent years. Therefore – and also owing to the often complicated infrastructures – these payment solutions can provide limited support to innovation in the area of payment transactions and as a result, they often give rise to payment solutions that are not interoperable with each other. The execution time of interbank transactions also lags behind the speed warranted by the level of development of the existing IT and communications infrastructure. And with the appearance of new, innovative service providers, in the next few years banks may find themselves in fierce competition with new market participants even in Hungary, which could jeopardise the bulk of their revenues from payment services.

In order to prevent the emergence of a fragmented market structure and to support the creation of efficient payment solutions, there is a need to establish a central basic infrastructure that supports the operation of innovative payment services. The instant payment system to be established should be capable of supporting the possibility of electronic payment in as many payment situations as possible. The service should also ensure access to the system at low cost and with minimal technical entry restrictions on the side of the payer and on the side of the payee alike. In addition to replacing the low-value credit transfer and direct debit turnover, the new payment service should be also aimed at facilitating a competitive environment for cash use and for the rest of the electronic payment solutions in as many cases as possible. To ensure broad-based usability, it is important to have the ability to identify the participants of the transaction not only by account number but also with the use of other unique identifiers; to transfer payment information to stakeholders through numerous channels; to ensure that the amount paid is immediately credited to the beneficiary's account; and to ensure that both the payer and the payee are automatically notified of successful execution of the transaction. In implementing the instant payment service, in addition to ensuring the interoperability of the payment services, efforts should be made to encourage competition between payment service providers and other payment market participants. If the instant payment system is implemented with that in mind,

[50] Credit transfers, direct debits and payment card transactions.

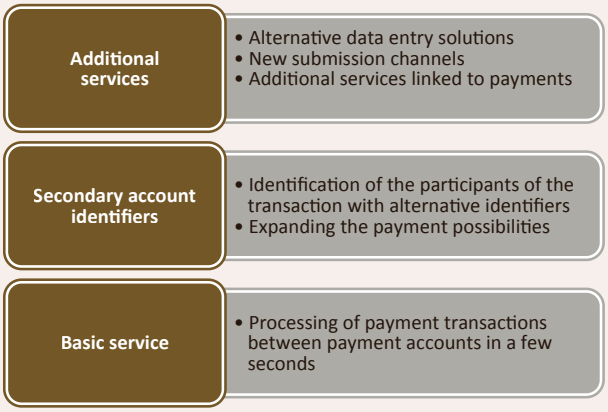
it may enable current participants of the payments market to provide competitive services in the long run. Moreover, implementation of the system may foster the emergence of new market participants whose solutions would be interoperable with the solutions already available in the market and provide their services without the creation of new, overlapping infrastructures (Chart 29).

Chart 29
Relationship between main payment situations and the instant payment service



The objective of implementing the instant payment system is to create a continuously available basic infrastructure which, on the one hand, supports the execution of payment transactions between the payer and the payee within seconds and, on the other hand, facilitates the emergence of innovative payment solutions and the ancillary services through its flexible message processing capability. In line with the expectations of the European Central Bank and the ERPB, the instant payment service should be implemented in such a layered model, where any market participant can create its own payment service based on the central clearing and settlement infrastructure. While they would compete with one another with respect to the range and quality of the services provided, thanks to the use of the basic infrastructure and the common standards, they would be interoperable with each other. Services built on the instant payment system can be divided into two parts: a basic and an additional service level (Chart 30). The basic service should be the same for all payment service providers. In the context of the basic service, the amount sent by the payer should reach the payee within five seconds at the latest in such a way that it is promptly available for use by the payee. This requirement should be equally satisfied in the case of transactions initiated or received by the customers of indirect members and in the case of intrabank transactions. As regards additional services, however, there is ample room for competition between market participants; indeed, building on the basic infrastructure numerous services can be created that could extend the basic payment services or even link additional services to them.

Chart 30
Structure of the services provided in the instant payment system

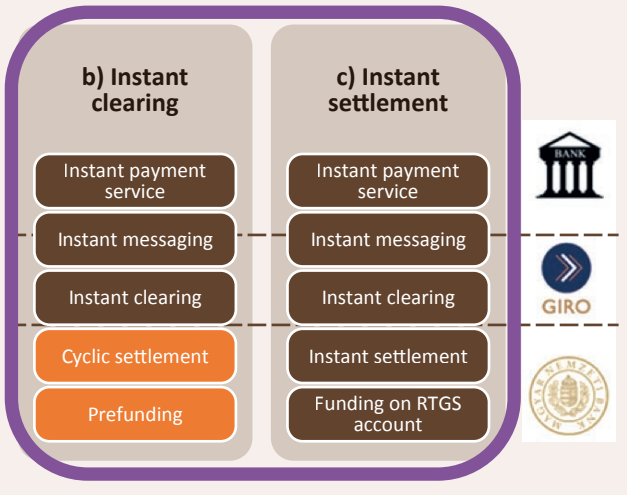


Implementation of the instant payment system contributes strongly to improving the efficiency of the domestic payment infrastructure, thereby supporting the competitiveness of the economy. Use of the instant payment system benefits all actors of the economy in numerous ways. Owing to the speed of the transactions and the additional services made available by market participants, in addition to the currently available cash payment option retail customers will be enabled to use electronic payment methods in new payment situations. This affects retail and bill payment situations, as well as direct electronic payments between individuals alike. Retail participants may benefit from such electronic payment options where electronic payments can be accepted at low cost, and merchants receive consideration for the transactions completed at the moment of the purchase. Corporations benefit from the faster processing of transactions as this could eliminate the lack of confidence between corporations, which has frequently been the underlying cause of participants' preference for cash. As regards the government, currently cash-based, government-related transactions can be electronised and new solutions may emerge, allowing government participants to receive data supplies regarding economic events.

For the broad-based use of instant payment services, the use of secondary account identifiers should also be enabled; indeed, these identifiers could significantly simplify the payment process in numerous payment situations. With a system supporting secondary account identifiers, identifiers frequently used by the customers at present (e.g. phone number, email address) can be linked to account numbers. This means, for instance, the ability to initiate an instant credit transfer via a mobile phone application, just by entering or selecting the phone number of the beneficiary. The database supporting the secondary account identifiers should be set up in such a way that any identifier contained in the database can be linked to the identifiers of payment accounts or to the identifiers of the account manager service providers. In addition, the registered secondary identifiers should be available in every service used by the customers.

The basic infrastructure of the clearing and settlement service should be designed in such a way that it does not increase the cost and resource requirement of the liquidity management of participating payment service providers significantly. With that in mind, the basic infrastructure can be designed in two ways. On the one hand, it would be possible to process the clearing of instant payment transactions in GIRO Zrt. and their interbank settlement in VIBER real time, at transaction level by using an infrastructure operating non stop and, on the other hand, it is also possible to operate the instant payment system with prefunding, where payment service providers could participate in the real time clearing operated by GIRO up to the level of their liquidity set aside in advance, while the transactions would be settled in VIBER in cycles (Chart 31).

Chart 31
Selected theoretical models of the instant payment system



Whichever option is chosen, priority should be assigned to the effects on banks' liquidity position and, in order to reduce liquidity management costs, the application of transaction limits may be required. Importantly, if transaction limits are set, it should be mandatory to submit transactions below the limit to the instant clearing system. Depending on the exact operation of the clearing and settlement solutions, individual transaction limits can be set at lower (a few million forints) or higher (up to as high as HUF 100 million) values. In the instant clearing scheme, besides the application of transaction limits, risks associated with the execution of instant payments can be mitigated further by the continuous recalculation of the participants' net positions. Another risk-mitigating option could be the shortening of the periods between the settlement of the transactions. This option would lower the total value of the transactions that have been executed between customers already but are yet to be settled between the payment service providers. This could be resolved, on the one hand, by the instant settlement of transactions or, if the cyclical settlement option was chosen, by increasing cycle frequency.

In line with the decision of the Financial Stability Board, in May 2016 the MNB initiated a broad-based consultation with all stakeholders in the implementation of the instant payment system to ensure the availability of all important information as decisions are made on the operational details of the system. In this context, the MNB had assessed and presented in detail to the stakeholders several possible implementation models. Essentially, the operation of the clearing and the settlement levels constitutes the main difference between the possible models, but the service level is the same for all models. Whichever model is used in the implementation of the instant payment system, key priority should be assigned to the management of direct debits and credit transfers initiated in batch; moreover, a detailed assessment is needed regarding options for the possible continuing operation of low-value clearing systems parallel to the instant payment system. The volume of transactions excluded from the instant payment system due to the application of limits may also have an impact on the location at which transaction types with smaller turnover should be processed. It is important to avoid more than one small-value payment system operating in parallel with the instant payment system, as this may be detrimental to the efficiency of the domestic payment transactions and may generate higher operational costs for payment service providers.

4.2 Gradual phase-out of overnight clearing

In order to support the efficiency of government payments, the MNB wishes to achieve that the individual and batch credit transfers of the State Treasury are executed – similar to the credit transfers in the sector of credit institutions – in a quick, state of art intraday clearing system. When credit transfers are shifted to intraday clearing from overnight clearing, migrating the batch credit transfers of the Treasury will be one of the most important tasks, given that certain bulk payments – e.g. pensions, social allowances – are typically concentrated on specific days. Therefore, on these days an extremely high volume of transactions will need to be cleared quickly, with the values of the payment orders credited to the payment account of the beneficiaries. The need to phase out credit transfers from overnight clearing prompted the introduction of GIRO's early morning clearing cycle and primarily, this cycle will be responsible for the processing of the batch credit transfers of the Hungarian State Treasury. Thanks to the early morning clearing cycle, beneficiaries will be able to receive the payments no later than the usual hour. The MNB, GIRO and the credit institutions have made preparations for introducing the 0th clearing cycle; its scheduled launch at the beginning of 2017 depends on the Treasury's preparedness. After migration, only debit-type payment transactions will remain in overnight clearing; options for their future clearing and location will need to be assessed during the implementation of the instant payment service.

4.3 Introduction of the intraday clearing and settlement of bank card payments

It is the expectation of the MNB to introduce, similar to credit transfers, the intraday clearing and settlement of domestic payment card transactions. One of the fundamental goals of the MNB's activities to develop payment systems is to accelerate the clearing of payment transactions, including card purchases. In line with that, the intraday clearing of credit transfers was introduced in 2012 and the cycle frequency was doubled during 2015. However, in the case of payment card purchases, which is the most popular and most dynamically growing electronic payment method, the value of the purchases is generally not credited to the merchants' accounts until 1 or 2 days after execution of the transaction. The extension of intraday clearing and settlement to card payments paves the way for the further expansion of the card acquirer infrastructure, offering even more locations where cash payments can have an electronic alternative.

In line with the expectations of the MNB, GIRO has commenced work on examining the clearing options of domestic payment card transactions. The European regulation on interchange fees provides an opportunity for taking over the clearing of domestic payment card transactions from the international card brands. The regulation sets forth numerous new provisions regarding business rules. In this context, the clearing of card transactions needs to be separated from tasks related to card scheme functions, which will also open up the possibility of market competition for the processing activity.

4.4 KELER's accession to T2S

In line with the revised migration plan, KELER is scheduled to join the TARGET2-Securities (T2S), the new pan-European securities settlement platform, in the fourth wave, on 6 February 2017. Central securities depositories participating in the project can migrate to the European infrastructure launched on 22 June 2015 in five waves at near six-month intervals between June 2015 and September 2017. In the autumn of 2015, the Euroclear Group – one of the largest central securities depositories of the European market – indicated that due to uncertainties around its scheduled migration in March 2016, it wished to join the system at a later point. After having discussed the potential impact of the Euroclear Group's delay, decision-making bodies of the T2S project decided that several depositories, including KELER, would join the platform one wave later. Therefore, instead of 12 September 2016, the Hungarian depository will join T2S on 6 February 2017. KELER has conducted consultations with Hungarian securities market participants regarding the delay of the Hungarian migration and, in line with the project requirements, it prepared a new migration plan, taking into account the modified deadlines for the system tests relevant to the Hungarian market. Since the MNB decided not to make the forint available on the platform as a settlement currency for the time being, after the accession of KELER, T2S will primarily serve as a settlement platform for Hungarian securities traded in euro. Meanwhile, the Hungarian depository will serve as an access point for Hungarian clients wishing to invest in other European countries and for foreign clients wishing to invest in Hungary.

Box 4

Launch of T2S and the expected impact of KELER's migration on central bank collateral management

As a result of the largest European infrastructure development project in recent years, the TARGET2-Securities (T2S) pan-European securities settlement platform was launched on 22 June 2015. On this day, the central depositories of Greece, Romania, Malta and Switzerland went live, followed shortly by their Italian counterpart on 31 August. In accordance with the migration, the respective depositories of Portugal and Belgium also completed their migration process on 29 March 2016 and as a result, by April 2016 seven European central depositories had access to the most modern infrastructure of Europe that supports the efficient settlement of the securities transactions of participating depositories, thereby reducing the costs of cross-border transactions and improving the appeal and competitiveness of the European securities market. By using the system, through a single link – its own national depository – a European investor can gain access to the securities selection and partners of all participating depositories without having to build costly correspondent accounts in the desired countries. This may contribute to creating an environment where Europe is in the position to act as a single securities market both for national and for international investors.

Before the launch of T2S, when a Portuguese investor wished to purchase Greek securities, it had to have a contact with the local depository where the Greek securities were registered. This contact was manifested in a direct or indirect system membership, and the membership fee increased the costs of holding the securities. Accordingly, an investment service provider with a wide product selection needed to build correspondent account contacts with all affected depositories, which ultimately increased – through the service providers' costs – the costs of the end investor as well. Recognising the fact that the maintenance costs of the resulting overlapping networks reduces the competitiveness of the European capital market both for European and non-European investors, the European Central Bank launched the T2S project to mitigate the redundancy. The new infrastructure creates shorter access routes by offering depositories a simpler connectivity option and a common settlement mechanism with an opportunity for standardised business operations. Consequently, central depositories assume responsibility for building international correspondent accounts, but thanks to the technical solutions of T2S and the supporting European regulation, establishing the background infrastructure for a single European capital market will be less of a challenge for them.

Through a single depository, the Portuguese investor in the example above can now gain access to the securities selection of all other T2S depositories, saving all the costs that were paid in the past to local intermediaries in specific national markets.

A prerequisite for systemic cooperation between European depositories is the harmonisation of their basic processes. Harmonisation provides the means for the efficient operations of a shared settlement system. Importantly, all depositories are expected to have a harmonised calendar of opening days and a harmonised timetable for the business day ("settlement day"), and indirectly, this may have an impact on the processes of the MNB. A business day closes at 6 pm in T2S, followed by 45 minutes of end-of-day processing. The next business day opens between 6:45 pm and 8 pm, and will be available from 8 pm. Since KELER is also expected to adopt the timetable of the business day, it needs to revise its submission cut-off times that are currently set after 6 pm. Such a cut-off time is applicable to the pledging of securities in favour of the MNB as well, as for the time being, the banking sector has until 6:30 pm to complete this process. The deadline for pledging, therefore, needs to be brought forward to at least 6:00 pm after KELER's accession to T2S, which will reduce the time limit available for banks by at least 30 minutes. The next potential change arises from the calendar applied by T2S which, contrary to Hungarian practice, does not apply Saturday business days and does not consider national holidays. After accession, KELER will comply with both the Hungarian calendar and T2S's calendar, but this means that on some business days it will have no access to T2S. Under the infrastructure cooperation, there will be limited access to the pledging function in these cases, which means that on Saturday business days banks presumably will not be able to increase their credit lines with the MNB by pledging additional securities. The reason for this is the fact that collateralisation events must also appear in T2S to preserve consistency between the records of KELER and T2S; however, since T2S will not be available on Saturdays, the synchronisation of records will be impossible. Presumably, this will have to be managed by restricting the collateralisation function on these days. Consultations are in progress between the MNB and KELER regarding these potential changes, and the affected market participants will be informed in due time.

According to the assessment of the European Central Bank, KELER has made adequate progress in completing the tasks to be performed before the accession. Before the go-live date, further developments are needed to support a number of tasks,[51] including those related to the management of corporate actions.[52] Before joining T2S, KELER needs to provide evidence that its internal processes conform to those applied by the platform. Harmonisation tasks affect legal and information technology topics, as well as issues regarding business operations, such as the regulation of settlement finality, the applicable message standards and the definition of the exact timetable of a business day. A special item among those to be harmonised is the management of corporate actions, which requires significant changes across Europe both in terms of the legal environment and in terms of market standards. The reason for this is the fact that there is no uniform European practice regarding the processing of corporate actions related to securities involved in pending transactions. An example for this is the management of dividend rights associated with securities included in orders that have been received by the depository but their settlement is still pending. Given the large number of country-specific features, standardising the management of corporate actions across Europe is one of the greatest challenges of the T2S project. KELER and the MNB are committed to putting in place the necessary changes in Hungary. The technical conditions for T2S accession will be provided by the Strategic Modernisation Programme launched by KELER in 2012, within the framework of which several T2S-specific modifications will go live before KELER's accession on 6 February 2017. Thus, the months remaining until entry will be dedicated to these preparations, and the MNB is providing full support to KELER in the execution of the developments ahead.

[51] Europian Cental Bank (2016): Sixth T2S Harmonisation Progress Report

[52] Corporate actions are the cases where the owner of a negotiable instrument is entitled to exercise the rights attached to the instrument vis-à-vis the issuer (e.g. dividend payment, general meeting, interest payment, etc.).

5 Security issues in payment transactions

The safe operation of financial infrastructures and electronic payment instruments is indispensable for promoting the widespread use of these payment instruments. Therefore, risks and fraud associated with electronic payments should be monitored on a continuous basis, and clear rules should be defined regarding the operation of the payment instruments. In light of the rapid technical progress and the use of payment methods in new areas, it should be borne in mind that innovation should not jeopardise the safe execution of transactions and confidence in payment systems.

5.1 Fraud related to electronic payment transactions

The ratio of payment card fraud to total turnover and the value of fraud increased somewhat in 2015, but it can still be considered extremely low (Charts 32 and 33). The upward shift in fraud observed in 2014 continued in the first three quarters of 2015, but the Hungarian payment card system remains extremely safe in international comparison as well. 16,504 fraud events were recorded in relation to payment cards issued in Hungary in the first three quarters of the year, and the related losses amounted to almost HUF 575 million. Although from the second half of 2013 both the number of fraud events and the losses sustained edged up compared to total turnover, the respective ratios are still below 0.005 and 0.01 per cent of the total transaction turnover. On the acquirer side, 2,204 fraud events were recorded in the Hungarian acceptance network, causing more than HUF 116 million in damages in the first three quarters of the year. As regards card technologies, in terms of fraud, there appears to be no difference between traditional and contactless cards; the faster and more convenient use of contactless technology does not pose any additional risk to customers.

Chart 33
Year-on-year changes in the turnover of cards issued in Hungary vs. in the number and value of the fraud events related to their use
(2011–2015)

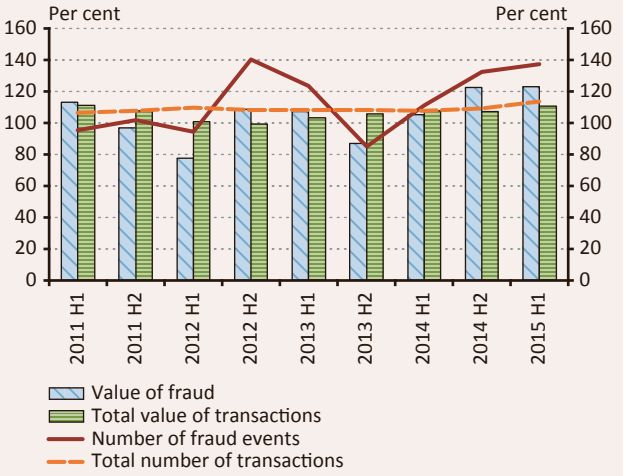
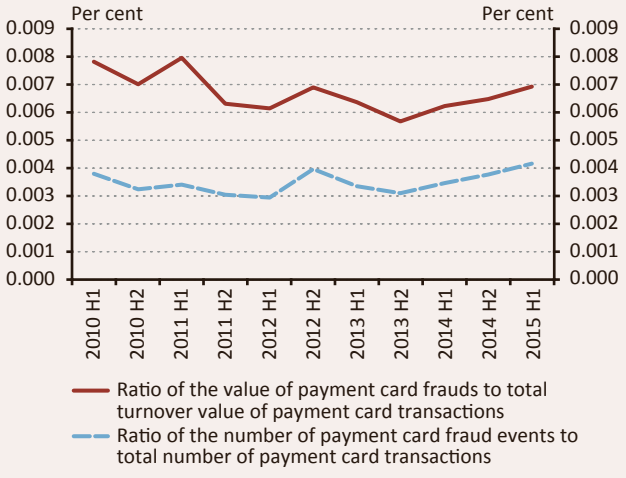
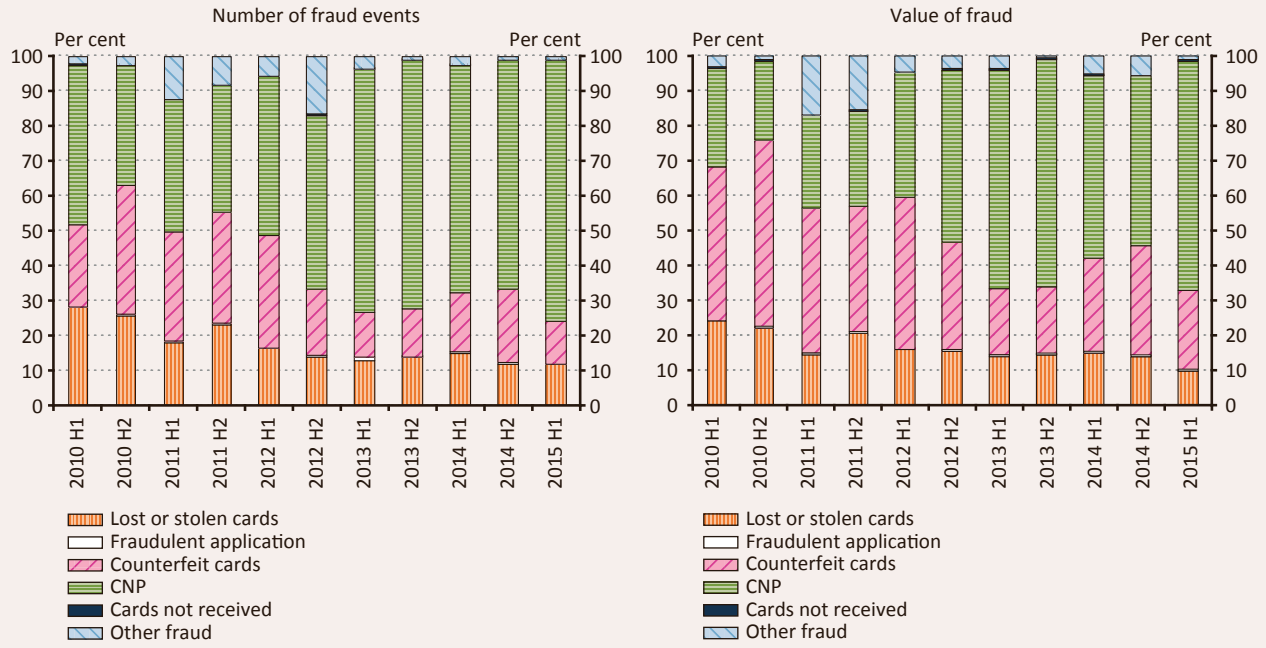


Chart 32
Ratio of fraud and related losses to total payment card turnover on the issuer side
(2010–2015)



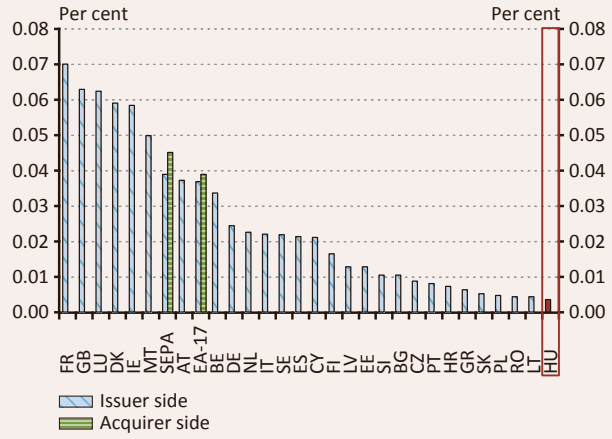
Fraud mainly affected cross-border transactions and card-not-present (typically online) purchases. In the first half of 2015, around three quarters of all fraud events were recorded in relation to card-not-present transactions. It should be noted, however, that even in comparison to the substantial rise in payment card turnover, the surge in the turnover of online purchases is remarkable, which, therefore, could have been one of the reasons behind the increased fraud ratio in this category. Trends are fairly similar regarding the losses generated by fraud events, although the ratio of fraud losses from counterfeit cards is somewhat higher (over 23 per cent in 2015 Q1) in terms of value than it is in terms of number (Chart 34).

Chart 34
Distribution of the number and value of fraud events related to payment cards issued in Hungary by fraud category
(2010–2015 Q1)



Payment with cards issued in Hungary is extremely safe by European standards as well. Based on the analysis of 2013 data presented in the European Central Bank's comprehensive report[53] on card fraud, Hungary recorded the lowest fraud losses in Europe in relation to transactions by payment cards issued in Hungary (Chart 35). Card fraud is typically related to international perpetrator groups that tend to attack countries with less safe infrastructures. Preserving the current safety level of the Hungarian payment card system is an important goal, which requires continuous development efforts both on the part of payment service providers and on the part of card companies.

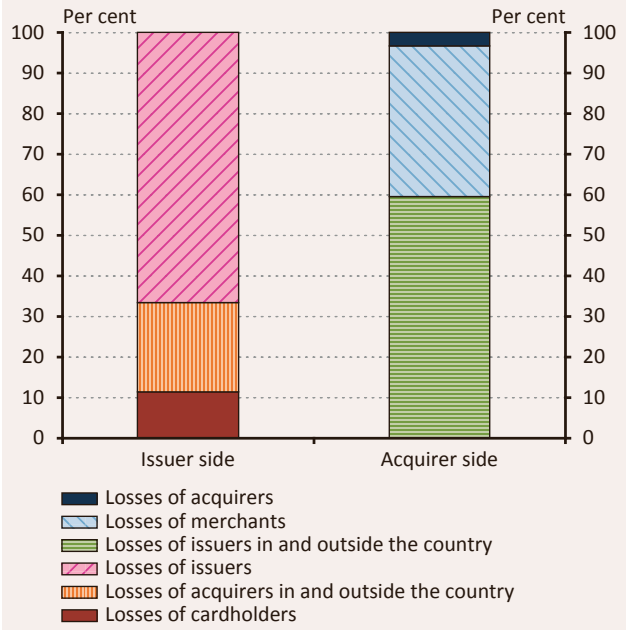
Chart 35
Value of fraud losses as a percentage of total payment card turnover in individual European countries
(2013)



Source: ECB: Fourth report on card fraud

[53] European Central Bank: Fourth report on card fraud, 2015.

Chart 36
Losses written off in relation to payment card fraud on the issuer and on the acquirer side
(2015 Q1–Q3)



Primarily as a result of regulations in favour of consumers, the vast majority of the losses written off in relation to payment card fraud are borne by the issuer and acquirer payment service providers instead of the cardholders (Chart 36). Losses written off on the issuer side in the first three quarters of 2015 approached HUF 537 million, but only 11 per cent of these losses were borne by customers. On the acquirer side, slightly less than two thirds of the losses written off were borne by issuers and one third was paid by merchants (see Box 5, "*Who foots the bill*?").

Box 5
Who foots the bill?

The Act on Payment Services prescribes numerous rules to protect payer (cardholder) customers in relation to the use of payment services, including cases of payment card fraud. The Act on Payment Services establishes detailed rules regarding liability and loss allocation relating to payment services and the relevant tasks. The customer is required to notify the payment service provider without undue delay upon becoming aware of loss or theft of the payment card or of its unauthorised use. However, assisted by various monitoring systems, even payment service providers may become aware of such payment transactions, irrespective of customer reports. After being notified by the customer, the payment service provider must refuse the execution of any payment transaction based on a payment order given by a payment card, and, if agreed in the framework contract, the payment service provider may block the payment card on suspicion of unauthorised or fraudulent use or for the protection of the payment card. The payment service provider may not charge a fee for blocking the payment card or for the refusal of the execution of a payment transaction based on a payment order given by payment card.

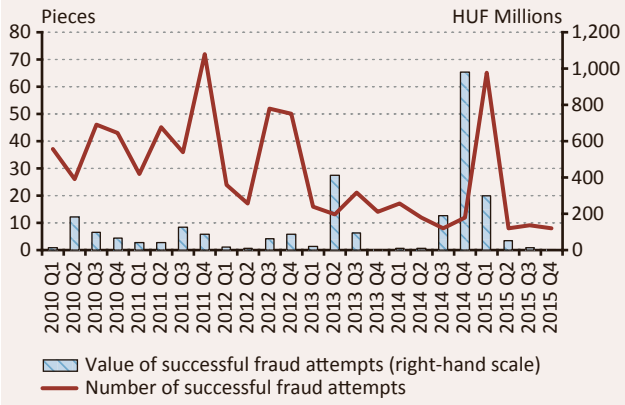
The Act on Payment Services has no provisions regulating that the customer is required to file a police report in the event of payment card fraud, theft, etc. Therefore, the investigation procedure of the payment service provider cannot be conditional upon the customer's filing a police report; it is conducted irrespective of such a report. It is extremely important to note that each individual case requires individual consideration. By default, when a payment transaction unauthorised by the customer is executed (by way of fraud by a third party), among other things, the payment service provider is required to refund the amount of the unauthorised payment transaction and to compensate the customer for the losses sustained. Although there may be some cases where the customer is forced to bear the losses, it is important to know that the extent of this loss allocation is basically limited. Therefore, provided that the customer did not act fraudulently or with malicious intent – for instance, the fraud was perpetrated by a lost or stolen payment card and PIN code – it will bear the losses sustained prior to notifying the payment service provider of the fraud only up to a maximum of HUF 45,000. In fact, following the implementation of PSD2 into Hungarian legislation, as of the beginning of 2018, this amount is expected to be reduced further to around HUF 15,000. After

receipt of the customer's notification, the payment service provider bears all the losses resulting from the loss or theft of the payment card.

By default, the payment service provider must accept the customer's claim of fraud. If the payment service provider questions the customer's claim that the payment transactions concerned were not authorised or initiated by the customer, it is the obligation of the payment service provider to prove that the payment transactions in question were indeed authorised or initiated by the customer. The payment service provider will only be exempted from its liability for damages if it can provide evidence that the damages were caused, for example by the customer's fraudulent actions. In such cases, the total loss will be borne by the customer. It should also be noted that the customer will bear full liability for the losses if it failed with intent to notify the payment service provider of the theft of the card even though it was aware of the theft, or if it acted with gross negligence, such as keeping its PIN code together with the payment card.

There is significant volatility in the number and value of fraud events affecting other, non-card electronic payment turnover, but their ratio as a percentage of total turnover is negligible (Chart 37). The number of successful fraud events remained below 80 in each quarter of the past period, but compared to the 80–90 million electronic payment transactions processed quarterly (e.g. credit transfers, etc.), this level is insignificant. The value of fraud is similarly low in this category.

Chart 37
Number and value of fraud events in electronic payment transactions[54]
(2010–2015)



In terms of fraud, cash use is far more dangerous for customers than electronic payment methods. It is not possible to compile comprehensive statistics comparable to those on electronic payment data on the number of fraud events and criminal offences regarding cash and cash transactions. According to criminal statistics, more than 2,000 wallet thefts and robberies were reported in 2015, while 7,000 cases of theft and robbery were reported in relation to domestic banknotes. In terms of volume, this is less than the number of fraud events reported in relation to payment cards issued in Hungary; however, there may have been numerous cases where the theft or loss was not reported by the victims. In addition, thanks to consumer-friendly regulations, only a small fraction of payment card fraud losses are borne by cardholders, whereas subsequent compensation is generally not an option in the case of cash, and the related losses are usually borne exclusively by the victims. The share of fraud affecting credit transfer and other transactions is extremely low; in addition, payment service providers apply numerous safety measures to ensure that the risk of fraud, from the perspective of customers, is negligible.

[54] The chart excludes data on payment card fraud.

5.2 Cyber risk

In the past 10 years, the increasing number of cyber attacks worldwide has also increased the cyber risk of financial market infrastructures. Addressing the issue of cyber risk is considered to be one of the most significant challenges of our time, as cyber attacks on financial market infrastructures – due to their central role in the financial sector – also carry systemic risks. Cyber attacks have become increasingly frequent and sophisticated worldwide, and since both the attackers and their motivations change continuously, it is difficult to prepare for averting cyber attacks. Cyber attackers take advantage of the increasing role of information technology in the operation of financial market infrastructures and in the provision of financial services, and they also benefit from the increasing interdependencies between the system operators and participants of financial markets.

Recognising the importance of cyber risk, several international recommendations have been issued, which are being integrated into the Hungarian oversight methodology. In 2012, the Committee on Payment and Settlement Systems (CPSS) of the Bank for International Settlements (BIS) and the American-based International Organisation of Securities Commissions (IOSCO) published their 24 *Principles for Financial Market Infrastructures* (PFMI), which set the requirements for financial market infrastructures on uniform foundations. These overseer principles treated cyber risk as part of operational risk. In view of the increasing threat of cyber attacks, they examined cyber risk from several aspects, and subsequently, along the lines of the principles of the PFMI, BIS issued more detailed recommendations[55] regarding the cyber governance, general risk management, settlement finality, communication and links between financial market infrastructures. BIS and IOSCO drafted a guidance[56] on the application of the new cyber risk recommendations. In the context of an international consultation, the provision of opinions on the Guidance is in progress. The MNB has also offered a number of proposals – after having requested the opinion of the overseen systems – with respect to the Guidance. The adaptation and implementation of the international recommendation into the Hungarian oversight methodology is in progress.

[55] Cyber resilience in financial market infrastructures (November 2014).
[56] Guidance on cyber resilience for financial market infrastructures – Consultative report (November 2015)

5.3 Publication of SecurePay recommendations

With the publication of the MNB's Recommendation for the security of internet payments and the ongoing inspections verifying compliance, fraud and misuse will become preventable in this area.[57] In order to ensure compliance with the guidelines of the European Banking Authority (EBA), the MNB developed and published on 13 November 2015 on its website, its "Recommendation for the security of internet payments".[58] The Recommendation is intended to offer guidance to all financial institutions providing online services. The Recommendation covers online credit transfers (e.g. utility bill payment, online purchases via credit transfer), card payment transactions on the internet (online payments with bankcards), the issuance of online direct debit electronic authorisations, as well as transfers of electronic money between e-money accounts via the internet. The main purpose of the Recommendation is to prevent fraud and misuse related to internet payments – including the use of bankcards on the internet – and hence, to maintain confidence in online payment methods, which serves the interests of banks and customers alike. To that end, in addition to the minimum requirements for the general control and security environment and the specific control and security measures on internet payment transactions, the Recommendation sets out requirements regarding the provision of information to customers, the education of customers and the method of communication with customers. This is particularly important in light of the recent, spectacular boom in online sales across Europe. The highest growth rates were achieved in the countries of the Central and Eastern European region; in 2014, Hungary's turnover rose by 25 per cent. Since EBA's guidelines on the security of internet payments were incorporated into the renewed Payment Services Directive (see Chapter 3.3), upon the transposition of the Payment Services Directive into Hungarian law, the MNB Recommendation will be repealed and the amended Hungarian regulations will be applicable.

One of the most important changes affecting customers and banks alike is the tightening of the customer authentication procedure. Single factor authentication – which requires a single, static password linked to the user ID – does not provide adequate security for financial services provided over the internet. In order to improve the safety of online payments, the Recommendation prescribes strong customer authentication for the use of the service or for the modification of data. In practice, strong customer authentication means a procedure designed to identify customers unambiguously, based on two or more elements classified into the category of authentication. The elements are mutually independent of one another; therefore, the breach of one element does not influence the reliability of the rest of the elements. Specific authentication categories include knowledge-based authentication (information known only to the user of the service, such as password or PIN code); possession-based authentication (the possession of the object is intrinsically linked to the identity of the user, such as a payment card); and biometric caracteristic-based authentication (personal traits of the user, such as the user's fingerprint or voice). In some cases, lower security level customer authentication procedures are also permitted, such as outgoing transactions to reliable beneficiaries pre-defined on the customer's white lists, transactions between two accounts of the same customer held by the same institution, credit transfers between accounts held by the same institution and deemed agreeable by transaction-based risk management, and low-value payment transactions. In all other cases, customers must go through tighter authentication procedures whenever they enter their internet bank for payment purposes or pay online by entering their bankcard data. In practice, strong customer authentication is typically based on a user name and a static password specified by the customer, complemented by a one-time password that may be delivered to the customer on a variety of channels such as being sent in a text message to their mobile phone or generated by themselves using a token provided by their bank.

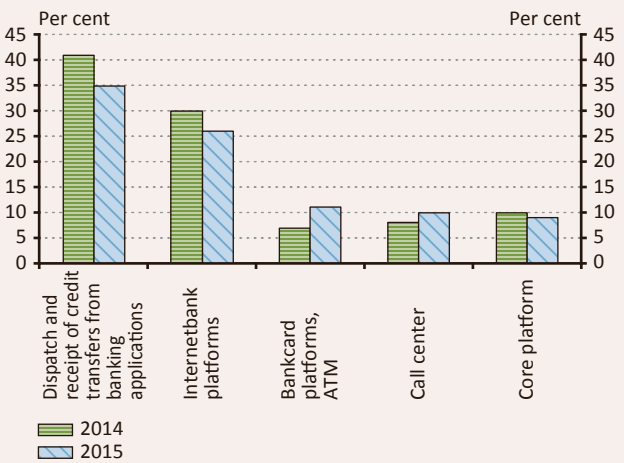
[57] http://www.origo.hu/gazdasag/20151116-fokozodik-az-elektronikus-fizetesek-biztonsaga.html
[58] http://www.mnb.hu/letoltes/a-magyar-nemzeti-bank-15-2015-szamu-ajanlasa-az-interneten-keresztul-nyujtott-penzugyi-szolgaltatasok-biztonsagarol.pdf

5.4 Payment malfunctions in 2015

The ad-hoc reports of the banking sector on payment malfunctions rose 1.5-fold in 2015 compared to the previous year, but the number of reports is still regarded low relative to the number of payment service providers and to the complexity of the financial infrastructures. For a more accurate assessment of the operational risk of payment services, the MNB has instructed banks, specialised credit institutions and branch offices to report payment malfunctions.[59] In 2015, 27 credit institutions reported a total of 247 payment malfunctions, while 169 cases were reported by 26 credit institutions in 2014. According to the reports, calculated from the start, the duration of the malfunctions was 3 hours and 40 minutes on average, which implies an improvement by nearly 20 minutes compared to 2014. The time between the occurrence of the incidents and their detection was still below half an hour.

Either because of the type or the duration of the incident, 14 per cent of the reported malfunctions violated the provisions of MNB Decree No 18/2009 (VIII. 6) on Payment Services Activities. In most of these cases, credit institutions failed to fully comply with the provisions pertaining to failure to credit immediately and to the execution time[60] of the payment transaction between payment service providers. These delays can be generally measured in hours, but in some cases, more than a whole banking day elapsed between the detection and correction of the error which, in the case of credit transfers, may have been particularly inconvenient for customers, irrespective of the value of the transaction (e.g. payment of tax obligations). According to the reports received by the MNB, 15 malfunctions at 7 credit institutions lasted for 24 hours or longer. Of these malfunctions, the time elapsed between the start of the malfunction and its detection was 16 days in one case and 31 days in another case. In the first case, the processing of a package containing direct debit requests sent to the overnight clearing module was inadequate – due to negligence by a staff member – while in the second case messages related to 700 direct debit authorisations provided by customers over the telephone were not sent to the beneficiaries due to a system failure. The malfunctions were eliminated shortly in both cases; however, customers may have been inconvenienced by the failed execution, especially considering the fact, that it is far more difficult for customers to monitor direct debit orders than, for example, failed card payments.

Chart 38
Payment malfunctions by failure type
(2014–2015)



Most payment-related malfunctions affected internet bank applications and the dispatch and receipt of credit transfers from banking applications (Chart 38). The most frequent problem affecting these transactions was failure to credit the transaction (forint credit transfers sent to intraday clearing, FX transfers, credit transfers via VIBER and postal cash payments) immediately. Problems affecting internet banking platforms often involved customers' failure to initiate credit transfers or their inability to monitor their account activity. Some of the errors were related to customer identification and to the internet bank as a stand-alone application. As regards identification, it should be noted that in some cases the problem arose at telecommunications service providers independent of the credit institution (SMS identification), but

[59] For the purposes of the reporting obligation, malfunctions include any disruptions or outages affecting payment services provided by the data supplier.
[60] MNB Decree, Section 21 (1) and Section 17 (2).

hardware and software malfunctions linked directly to the application were also frequent (out of memory errors, inadequate configuration of interfaces). It is important to take note of the steadily high number and growing share of bankcard and ATM-related problems (from 2014 to 2015 the share of these errors rose to 11 per cent from 7 per cent). This can be attributed to the multi-player nature of the process (card companies, merchants, credit institutions, telecommunications companies, etc.), which inevitably increases the risks and potential errors involved. Malfunctions between the internet banking service, the account management system and its supporting systems were a recurring problem with several banks. Eliminating these problems would require major IT developments, but based on the recurrence of these errors in the reports of the affected banks, for the time being, the banks concerned have tried to prevent the recurrence of the problem by various minor modifications.

In order to avoid the recurrence of the payment malfunctions experienced, credit institutions continued to respond with a variety of measures to find a temporary or a final resolution to the problems. These included rescheduling the updates of various system programs to periods outside opening hours, the reengineering of end-of-day procedures, adjustments to the band widths required for the operation of the systems, and the incorporation of new control points into various process.

6 Glossary

4-hour rule	Pursuant to MNB Decree 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 that 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.
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, 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 with 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 if either party 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 stripe 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 crystallise from the insufficient liquidity or 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.
Cooperative credit institutions operating with an integrated model	Cooperative credit institutions signing the 'agreement on the integration of cooperative credit institutions'. 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.
CSDR	Regulation on improving securities settlement in the European Union and on central securities depositories.
Customer payments	Payment orders generated by customers of system participants.

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 economic 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)	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.
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.
EBPP	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.
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 on OTC derivative transactions, 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 under 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 Elszámolásforgalmi Ltd.

Gridlock	Gridlock may emerge if orders submitted by one or a few 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 a number of 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 also provides a guarantee to KELER CCP up to a certain percentage of its capital. If in the course of the management of settlement fails KELER CCP needs, over and above the use of individual and collective guarantee elements, to resort to the guarantee callable on first demand, KELER is obliged to make available to KELER CCP funds up to the amount of the guarantee callable on first demand.
HHI	Herfindahl–Hirschman Index, an Indicator measuring market concentration, calculated by summing the squares of the percentage market shares held by the various market participants. Its value may be between 0 and 1. A value close to 0 means the absence of concentration, while 1 indicates a monopolistic market structure.
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 case of the 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.
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.
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 result the liquidity available as collateral for payment orders.
Issuer (payment card)	The payment service provider that makes the payment card available to the card holder and in the course of the settlement of transactions, forwards the value of the transactions to merchants through acquirers.
KELER	Központi Elszámolóház és Értéktár Zrt. (Central Clearing House and Depository Ltd.).
KELER CCP	KELER KSZF Központi Szerződő Fél Zrt. (KELER KSZF Central Counterparty 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.
Maximum usage of intraday credit lines	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.
MTF	Multilateral (aternative) 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. Then the net debit positions thus calculated are settled. If funds are insufficient, the guarantee system of net clearing must be activated.

NFKP	Daily Natural Gas and Capacity Trading Market.
Optional reserve requirement ratio	Since the reserving period of November 2010, credit institutions subject to a reserve requirement have been able to choose their reserve requirement ratio. They can change their ratio twice a year (in April and October), and choose between rates of 2, 3, 4 and 5 per cent.
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 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 system	In the case of the overseen systems, the form of cooperation based on the agreement between cooperating parties to run the system specified in point 18 of Chapter I of Annex 2 to the CIFE Act. Part of the financial infrastructure. It includes the different means of payment, 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 payments, potential liquidity is the sum of the account balance of the VIBER member's payment account with MNB, the intraday credit line provided against the securities pledged to the central bank, and other securities on the credit institution's balance sheet that may optionally be pledged.
PSA	Act LXXXV of 2009 on the Pursuit of the Business of Payment Services.

PSD	Payment Services Directive, Directive 2007/64/EC on payment services in the internal market.
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.
SCT	SEPA credit transfer
SDD	SEPA direct debit
SecuRe Pay Forum	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.
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, providing the execution of orders and, if necessary, grants credit to an entity or the central counterparty for the purpose of facilitating settlement.
SFA Act	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.
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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