



# PAYMENT SYSTEMS REPORT



2017

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

*King Louis I. ('The Great')*



# PAYMENT SYSTEMS R E P O R T

2017

Kiadja: Magyar Nemzeti Bank

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

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

*The analyses in this Report were prepared by the Directorate Financial Infrastructures of the MNB, under the general direction of Director Lajos Bartha. The Report was approved for publication by the Financial Stability Board at its meeting on 23 May 2017. Contributors: Patrik Gergely Balla, Dániel Béres, László Bodnár, Éva Divéki (editor), Gábor József Harkácsi, Dr Károly Horváth, Tamás Ilyés, László Kajdi, Miklós Luspay (Head of Department), Milán Mészárovcis, Beáta Kovács-Papp, Cecília Pintér (editor-in-chief), Ádám Szepesi, 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 14 March 2017 and 23 May 2017, and at the Monetary Council meeting on 9 May 2017.*

*The MNB staff relied primarily on information relevant to 2016, although in a forward-looking manner the Report also analyses the ongoing developments observed in the course of 2017.*



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# Key messages

**In 2016, the steady increase in the use of electronic payment methods continued, and contactless card purchases proved to be one of the most dynamically growing areas.**

Contactless purchases were boosted by developments in the payment infrastructure, as both the number of contactless cards and the number of compatible payment terminals grew significantly. The number of payment cards remained unchanged throughout the year, while the number of payment accounts rose by 2 per cent. In accordance with the relevant European regulation, payment accounts with basic features have been introduced. Furthermore, the development of a social basic payment account scheme is currently in progress, which – combined with the basic payment account – will facilitate easier and cheaper access to electronic payment methods for disadvantaged groups with no previous access to payment accounts. In the turnover of electronic payment methods, payment card purchases showed the most salient growth, but even the turnover of credit transfers and direct debits increased by almost 3 per cent. In addition to contactless purchases, payment card turnover was also boosted by online (primarily e-commerce), card-not-present transactions, although these still comprise only a small part of total card transactions.

**Gradually gravitating toward the European Union average, the efficiency of the Hungarian payment system has improved considerably in recent years.**

Every year, the turnover of electronic payments increases continuously in most payment situations, as does the share of electronic payments in total payments. Thanks to the payment system developments of recent years, at present, the ratio of credit transfers to GDP hardly lags behind the benchmark European Union average. Owing to the dynamic increase in card transactions, the value of electronic purchases relative to household consumption has nearly doubled over the past four years. Similarly, as a result of recent developments, significant progress was achieved in the electronic payment of utility bills and other service charges. The share of electronic bill payments grew to 40 per cent from 25 per cent in the span of two years, primarily owing to new developments by the Hungarian Post Office.

**The Hungarian payment card system is extremely safe even by international standards and, thanks to a consumer-friendly regulatory background, only a small percentage of fraud losses is borne by cardholders.**

Although payment card fraud increased in 2016, the number of fraud events and fraud-related losses both remained extremely low relative to the total payment card turnover. The rise in payment card fraud can be largely attributed to the dynamic growth observed in payment card turnover in recent years. Nevertheless, due to consumer-oriented consumer protection regulations, less than 10 per cent of all fraud losses are borne by cardholders; the rest is mainly passed on to card issuers and acquirer payment service providers. Fraud cases were primarily linked to online purchases and the turnover generated by postal and over-the-phone orders; as regards the direction of the transactions, they mostly affected cross-border purchases.

**The use of electronic payment methods is becoming less and less expensive for consumers.**

In annual terms, financial institutions collected more than HUF 472 billion in revenues from the provision of payment services. This 0.2 per cent annual increase, however, falls significantly short of the 12 per cent acceleration in electronic payment turnover. Hence, the revenues from fees charged in proportion to the number and value of transactions have declined relative to total turnover; consequently, the costs associated with the use of contemporary electronic payment methods are decreasing. Similarly, revenues from card issuance have also declined compared to the total number of domestically issued cards; in other words, the use of payment cards is becoming less and less expensive for consumers. The national regulation of interchange fees was intended to facilitate the expansion of the Hungarian payment card acceptance network, the actual effect of which – i.e. the decline in merchants' costs – is being continuously monitored by the MNB. Initial analyses indicate that the unit costs of merchants with a smaller payment card turnover are higher and decreased to a lesser degree after the regulatory changes of recent years compared to their high-turnover competitors. If this trend persists, the MNB and other authorities may need to take further steps to address this unfavourable situation.

**The operation of the overseen financial market infrastructures was highly reliable in 2016, supporting the safe and efficient execution of an increased number of transactions and hence, the functioning of financial and capital markets.**

The number of payment transactions executed in the overseen financial market infrastructures rose by 1.5 per cent, while the value of total transactions was down 3 per cent on average compared to the previous year. In 2016, the ICS and KELER saw an increase in turnover, while the number and value of capital market transactions cleared by KELER CCP remained largely unchanged. In VIBER, however, turnover value declined slightly despite the increasing number of transactions. This can be attributed to the decreasing value of interbank transactions, the phase-out of the two-week deposit and the reduced stock of overnight deposits held at the MNB. The availability of VIBER, KELER and KELER CCP improved compared to the previous year, but deteriorated slightly in the case of the ICS. Operational risk decreased, overall, in the overseen systems, mainly as a result of a decline in the number and duration of incidents. As a result of operating hour extensions, system operational interdependency risk increased slightly in 2016 compared to the previous year, but owing to the robust operation of the systems, it remained at low levels throughout the year. In respect of transactions processed in the payment systems, the clearing and settlement execution time shortened further in 2016. Similar to the domestic systems, the CLS and T2S financial market infrastructures – which are overseen cooperatively with the participation of the MNB – operated safely and efficiently.

**Thanks to the quick and adequate adjustment of participants to the changes to the MNB's monetary policy instruments, there was sufficient liquidity for the execution of payment transactions both at the systemic level and on an individual bank basis. Consequently, clearing and settlement risk did not increase in any of the payment systems.**

**In 2016, the risk management framework of KELER CCP efficiently managed and averted the spillover of defaults – the number and value of which increased during the year – to other market participants, without the need to use emergency measures.**

**On 6 February 2017, KELER Central Securities Depository successfully joined the TARGET2-Securities pan-European securities settlement platform, which led to an upswing in the demand side of the Hungarian securities market and expansion of the European securities supply available in Hungary.**

In VIBER, the liquidity of participants was shaped by numerous events in 2016, including the reduction of the frequency of three-month deposit tenders, the quantitative limit subsequently imposed on the main policy instrument and the reduction of the required reserve ratio from 2 per cent to 1 per cent as of 1 December. Securities holdings available as collateral were raised by VIBER participants continuously throughout the year; the most significant growth affected the group of government securities. The liquidity available in the payment system rose by around HUF 600–800 billion in total. Although the maximum utilisation of credit lines decreased on an annual basis due to the increase in payment system liquidity, participants used their credit lines more actively and for longer periods in their liquidity management compared to previous year for the execution of payment transactions. After the 1-percentage-point reduction of the required reserve ratio, the current account balance decreased in the case of nearly one third of VIBER participants; consequently, the usage of credit lines rose by 1 hour on average.

In 2016, defaults showed the highest values since 2012 both in terms of number and aggregate value. Most capital market defaults were securities leg defaults, primarily linked to the EuroMTS market – a segment intended to ensure trading in government bonds – and to the spot market equity segment of the Budapest Stock Exchange. The increased clearing and settlement risks arising in these trading venues in 2016 were successfully neutralised by KELER CCP. In most cases, it was the defaults of the non-clearing members and OTC clients of clearing members that ultimately led to the delay of clearing members. A number of financial defaults occurred in the futures and spot energy markets, in relation to which the clearing membership of the affected participants was suspended and additional financial collateral was imposed for risk management purposes. KELER CCP imposed additional financial collateral mainly on energy market participants in 2016, primarily due to their failure to comply with the required reporting obligations.

Following years of preparations, KELER joined the T2S securities settlement platform – one of the most significant infrastructural initiatives of the European integration – in the fourth wave of the migration of participating central securities depositories. Launched in the summer of 2015, the infrastructure was designed to support the safe and efficient settlement of cross-border securities transactions as a uniform information technology system, and to remove the legal and technical obstacles to the establishment of a single European capital market. KELER's accession opened up the possibility of broader access to Hungarian securities, and the resulting demand growth is expected to reduce the financing costs of Hungarian companies over the long term.

**In 2016, there was a more than six-fold increase in the value of FX transactions involving the forint that were settled through the CLS system with the elimination of foreign exchange settlement risk, which significantly supported the stability of the banking sector.**

The Hungarian forint has been available in the Continuous Linked Settlement (CLS) as a settlement currency since 16 November 2015. The first year of CLS membership generated a steep rise in forint turnover settled via the CLS system and the number of international institutions using the service more than doubled. FX transactions involving the forint can be settled in CLS free from foreign exchange settlement risk; in other words, trading partners are protected from the risks arising from the other party's default. In 2016, the daily gross forint turnover surged from HUF 80 billion to HUF 490 billion, and the netting effect available through the system rose from 68 per cent to 83 per cent. As a result of the latter factor, the net daily liquidity required for the settlement of the nearly HUF 500 billion gross turnover was only HUF 120 billion. An increasing number of Hungarian banks take recourse to the CLS system and participate in the provision of related services, which improves the sector's risk perception among investors.

**Regulatory changes affecting domestic payment transactions and financial infrastructures further increased the MNB's payment inspection competences.**

In accordance with the Interchange Fee Regulation included in the regulatory inspection programme of 2016, from 2017 the MNB's inspection competence will be extended further to verify compliance with specific provisions of the regulations on access to payment accounts with basic features and on account switching. Both government decrees are intended to ease and facilitate households' access to banking services and to encourage competition among banks in the area of payment services.

**According to the regulatory inspections conducted in 2016, financial institutions were most likely to violate regulations pertaining to the notification of clients and to the immediate crediting of payment transactions.**

In general, the payment inspections conducted in 2016 found that, despite being essentially compliant, all inspected credit institutions had committed violations to various degrees. The inspections conducted at 19 institutions found violations of legal regulations in 94 cases. Key violations included failure to provide information, inadequate rectification of payment transactions and inappropriate liability and loss allocation. Once again, the inspections were particularly focused on the immediate crediting of payment transactions to clients' accounts.

**On the developments completed in relation to euro payments, from November 2016 Hungarian payment service providers and their customers joined the Single Euro Payments Area.**

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". As a result, the customers of payment service providers can now execute euro payment transactions in Europe with the safety, speed and efficiency of domestic payments. The MNB continuously monitored the progress of SEPA preparations to ensure timely migration.

**Following consultations with affected market participants, on 13 December 2016 the Financial Stability Board of the MNB accepted the rules applicable to instant payment services.**

According to the rules, from the second half of 2019 payments under HUF 10 million must reach the recipient within 5 seconds, and the amount sent must be made available for any payment transaction. The new payment service will be available 24/7 every day of the year, and payment service providers must execute all credit transfers under this limit within the instant payment system. The implementation of the instant payment system enables the application of contemporary IT and communications solutions in payments. It will be possible to initiate payments via mobile phone numbers and email addresses and to connect additional, payment-related services to the system. This supports innovation, stimulates competition among the participants of the payment market and facilitates the market entry of new players.

**The establishment of the central infrastructure of the instant payment service commences in the spring of 2017.**

The real-time processing system of instant payments will be set up by mid-2019. The central system fosters payment system innovation, the market entry of new service providers and the interoperability of payment services by allowing new payment service providers and fintech firms to rely on a shared basic infrastructure for the operation of modern services. Moreover, besides transaction data, the system will be able to transmit the messages of additional services connected to payments and the information required for initiating payments.

**The MNB expects payment service providers to ensure that clients using the service are not charged perceivably higher fees for the use of the instant payment service and the simultaneous improvement in the service level.**

It is the MNB's requirement that the transaction fees of the central infrastructure not be raised as a result of the introduction of the instant payment system. Accordingly, payment service providers will have access to far more advanced clearing services at the existing fee level. At the same time, the MNB also expects payment service providers to ensure that the transaction fees of their clients are not raised perceivably. In pricing the service it should be considered that the investment and operational costs of the new payment system should be primarily offset by the increased revenues associated with the higher number of transactions. Payment service providers should view the implementation of the system as an investment in the future; indeed, without the system they would be at a significant disadvantage when competing with the new providers, which may jeopardise their market position. In order to ensure that the use of the instant payment service grows at a faster pace than the currently used electronic payment methods, market participants must actively contribute to developing the services built on the new system.

**The appearance of fintech companies pressures banks to change tack.**

Through the promotion of innovative services, the inevitable appearance of fintech firms and the digitisation of payment transactions induce numerous favourable changes in the execution of payments. At the same time, the change also involves risks, which should be addressed. The appearance of new service providers should not exacerbate market fragmentation or jeopardise the safety of payment transactions. With the market entry of innovative fintech companies, banks face intensive competition as the new players may challenge their market position and hence, threaten their revenues from payment services. In order to preserve their market position, banks are forced to complete significant changes; they need to develop their systems and the financial infrastructures that secure clearing and settlement to continuously provide their customers with instant payment services at the expected quality. More major development costs may be offset by the increased turnover resulting from the higher level of service which, owing to the shift from cash payments to electronic payments, may well be significant.

**The regulatory changes implemented in the new Payment Services Directive (PSD2) encourage the market entry of new, innovative players and increase competition in the market of payment services.**

On 13 January 2018, the European Union's new payment services directive comes into force, which is intended to support financial technology innovation and boost competition between payments market participants by establishing legal certainty and the neutrality of competition among payment service providers. It also prescribes security requirements for payment services to increase confidence in electronic payments. Owing to technological changes, the effect of innovations, the change in client requirements and the appearance of fintech firms (e.g. enterprises providing payment initiation services or account information services), the former legal regulation has been subject to significant changes. The new Payment Services Directive extends its scope to the services provided by these new types of firms and permits the provision of such services by authorised and supervised payment service providers. Pursuant to the authorisation granted under the new Payment Services Directive, in its regulatory technical standards the European Banking Authority (EBA) defined detailed security requirements for payment services. The subsequent modification of Hungarian regulations from 2018 will enable enterprises offering innovative payment services to enter the market in the context of a regulated framework, and the obligation to apply – and supervisory control over – the prescribed security requirements will become unavoidable.

**The MNB joined the research activity of a European working group set up with a view to assessing the applicability of the procedures that provide the technological background for virtual money.**

While the long-term benefits of the potential of distributed ledger technologies cannot be gauged precisely at present, their application in payment processes and in the renewal of financial infrastructures must be continuously monitored. Within payment developments, most market participants are already involved in examining the applicability of blockchain and distributed ledger technologies, primarily in the hope of creating an independent, cheap, fast and safe financial system through their use. New technological solutions can only be applied in the area of financial infrastructures when, in addition to their innovative and efficiency boosting features, they offer adequately mature, well thought-out solutions that ensure the safe, reliable and smooth operation of the system to help maintain confidence in the financial system. European central banks – including the MNB – have set up a joint working group for examining the application method of the distributed ledger technology in financial infrastructures, for ensuring the technical interoperability of new developments in the existing payment systems and for monitoring new market improvements.

**Since addressing cyber risks is an important goal for the MNB, it joined the working group set up by the European Central Bank to assess the IT security awareness of financial infrastructures.**

Cyber risk poses an increasing threat to financial infrastructures as well, and ultimately it may threaten financial stability. The ECB has set up a central bank working group with a view to reviewing the risk management practice of European financial structures and their resilience to cyber risk. The IT security awareness of individual financial infrastructures will be analysed in the context of a survey conducted by national central banks with the coordination of the ECB. Another objective of the working group is to create a forum where all main participants of the financial sector (financial infrastructures, credit institutions, authorities, regulators) are given an opportunity to improve IT security awareness by sharing their latest experiences on cyber risk.

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# Introduction

**As set forth in the Act on the Magyar Nemzeti Bank, one of the main responsibilities of the Magyar Nemzeti Bank (MNB) is to promote the smooth execution of payments and the reliable and efficient functioning of the payment and settlement systems.** The broader use of 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 economy 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 the Decree on the Execution of Payment Transactions and in the Act on the Provision of Payment Services is monitored by the MNB.

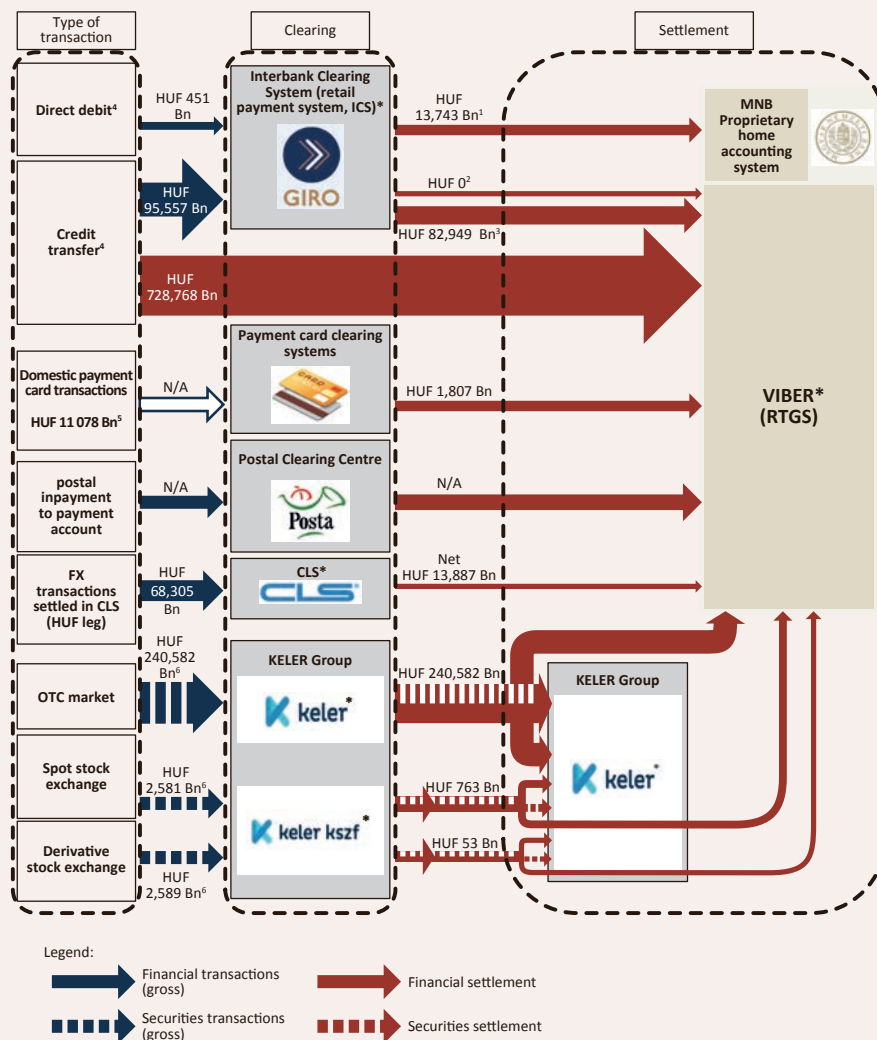
Examining the efficiency of payments, the first part of this Report presents the use of payment methods in Hungary and the relevant development trends, the changes in fraud events related to electronic payments as well as in the revenues from payment services and in the pricing of retail payment services. In addition, this part also summarises the important achievements of last year's enhancement of financial infrastructures. Following that, developments related to the functioning of the Hungarian financial infrastructures and their oversight are presented. The findings of payment inspections are also described in this part of the Report. The second part of the Report discusses two key issues in detail: the introduction of the instant payment system and certain implications of the impact of technological development on payment systems.

# 1 Operation of the domestic payment system

The smooth execution of payments and the reliable, efficient operation of financial market infrastructures are essential for the execution of real economy and financial transactions. Payments in central bank or

commercial bank money in account and transactions performed with securities and other financial instruments require centralised systems that provide for the clearing and settlement of transactions.

**Chart 1**  
Overview of the Hungarian financial infrastructure  
(2016)



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

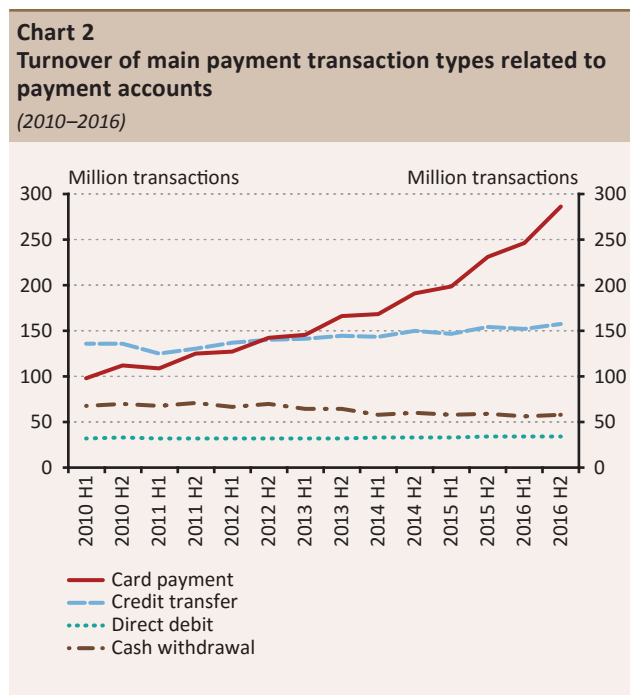
The Hungarian Real-Time Gross Settlement System (commonly referred to as VIBER) is operated by the MNB. Its primary purpose is the settlement of large-value, time-critical money and capital market transactions between participants and on behalf of their customers and of the related financial market infrastructures (ICS, KELER Group, CLS). The Interbank Clearing System (ICS) is a domestic, gross retail 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 CSD) and the central counterparty (KELER CCP), are responsible for securities clearing and settlement services, and the registration of domestically issued securities (Chart 1). The MNB's oversight activity in Hungary covers the VIBER, the ICS, KELER CSD and KELER CCP. In addition, the MNB takes part in the international cooperative oversight of CLS and T2S.

# 1.1 Payment service developments

## 1.1.1 TURNOVER OF MAIN PAYMENT INSTRUMENTS

Electronic payment transactions continued to expand in 2016. The most important driving force behind this was the dynamic growth in the popularity of payment by bank card<sup>1</sup> (Chart 2). The turnover related to purchasing by card had increased considerably in the previous years as well, but in 2016 it grew even faster, i.e. by nearly one-fourth compared to the previous year. Exceeding previous rates, the number of both credit transfer and direct debit transactions increased by nearly 3 per cent, as a result of which in 2016 their number rose to nearly 310 million and 70 million, respectively. The number of cash withdrawals continued to decline during the year, as the nearly 115 million transactions reflected a decrease of some 2 per cent.



The number of payment accounts held with payment service providers rose by nearly 2 per cent to 10.4 million in 2016. At the end of the year, more than

90 per cent (more than 9.4 million) of all the accounts were related to natural persons. The number of accounts used primarily for payment purposes exceeded 6.6 million. This category also includes approximately 530,000 retail accounts for (e.g. employees' or private bank) payment purposes that can be used under certain limiting conditions. Accounts possessed by natural persons also include, *inter alia*, savings accounts as well as accounts linked to credit and card products. Based on feedback from banks, the number of payment accounts with basic features that were introduced in Hungary by the implementation of the Payment Account Directive and can be used as of October 2016 is not significant, as there are many account packages available in the market that offer more advantageous conditions for consumers. A longer period of time needs to elapse before a clearer picture of the effect of the new regulation becomes visible. The MNB's previous representative household surveys suggest that the ratio of those who have relations with banks is satisfactory in general; coverage is more than 80 per cent at the household level. At the same time, in the case of some less privileged social groups the ratio of account possession is lower; a favourable change could be achieved in this area by the introduction of a basic account available on a social basis.

The payment card acquirer infrastructure expanded significantly, as a result of which it is possible to pay by card at more than 110,000 POS terminals. As a result of the more than 3 per cent increase, card payment is possible at more than 85,000 physical points of sale, and the number of POS terminals operating at the points of sale also grew considerably (by nearly 9 per cent). As a result of the development seen in the past years, at end-2014 some 53 per cent of retail stores<sup>2</sup> accepted cards, while this ratio rose to nearly 59 per cent in 2015. However, since in retail payment situations cards currently constitute the most important electronic payment alternative to cash, it is essential that the dynamic expansion of the acceptance network should continue. This may be significantly supported by the

<sup>1</sup> 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>

<sup>2</sup> Source: HCSO: [http://www.ksh.hu/docs/hun/xstadat/xstadat\\_eves/i\\_okk016.html](http://www.ksh.hu/docs/hun/xstadat/xstadat_eves/i_okk016.html)

POS terminal installation programme launched by the Ministry for National Economy (MNE). The impact of this programme on the domestic card market will be analysed by the MNB in cooperation with the MNE. Within the framework of the programme, the applicants that are awarded the support undertake to install 30,000 terminals and operate them for at least two years; as a result, the domestic acquirer infrastructure may expand by nearly 30 per cent.

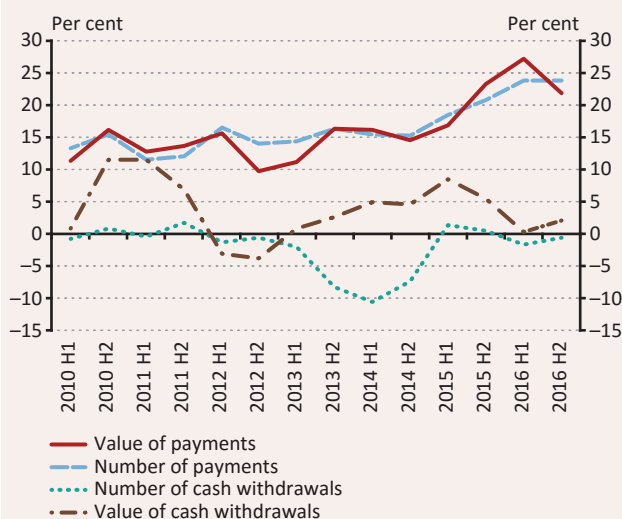
**The growth rate of card payment turnover exceeded even the level of previous years; the development was especially dynamic in the area of online purchases.** In 2016, the expansion in the turnover of payment card purchases exceeded – both in terms of the number and the value of transactions – the dynamic increase observed in the previous years. With more than 532 million purchases in Hungary and abroad using cards issued in Hungary, the number of purchases was some 24 per cent higher than the turnover in 2015, and the total transaction value of HUF 3,980 billion also represented a nearly one-fourth expansion compared to the previous year. Within card purchases, one of the most dynamically developing areas is that of card-not-present transactions, primarily performed on the Internet; both in terms of their number and value they increased by 50 per cent compared to 2015. At the same time, these transactions still account for a relatively low portion of the total turnover; one-tenth of them in terms of their number and 15 per cent in terms of value are performed this way.

**The number of payment card cash withdrawals declined slightly, while their total value slightly increased in 2016** (Chart 3). With the more than 106 million payment card cash withdrawals, some HUF 6,885 billion was withdrawn by the customers of payment service providers, representing a somewhat less than HUF 65,000 average transaction value. The trend of previous years continued in 2016, i.e. the number of cash withdrawal transactions declined, while their total value increased slightly. A significant difference is observed between the average values of ATM transactions by retail customers that account for nearly 98 per cent of cash withdrawal transactions and the cash withdrawals at bank branch POS terminals mainly used by corporate customers. While the average value of transactions performed at ATMs did not reach HUF 61,000, this same value for transactions at bank branches exceeded HUF 230,000.

**2016 was a turning point in the use of contactless technology; more than half of card purchases were performed using this technology** (Chart 4). In the previous years, the development of the contactless technology was significant primarily in terms of the infrastructure. As a result, by 2016 more than three-quarters of the POS terminals and nearly 63 per cent of the cards issued were suitable for contactless payment. In 2016, the increased popularity of the new technology was already strongly reflected in the use as well, and accounted for more than half of all the card purchase transactions, amounting to 35 per cent

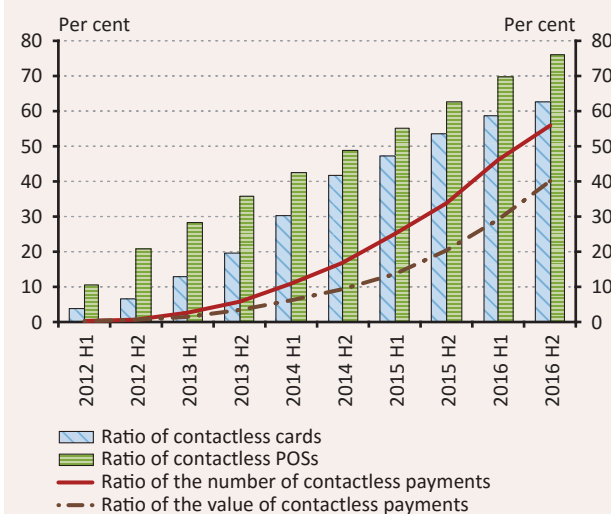
**Chart 3**  
Annual growth rate of transactions performed in Hungary and abroad with payment cards issued in Hungary (year-on-year)

(2010–2016)



**Chart 4**  
Spread of contactless card technology in the Hungarian payment card system

(2012–2016)



of the total value. Contactless transactions, which offer a quick and comfortable payment possibility, may have replaced many low-value cash payments as well. This is also indicated by the fact that while the

average value of transactions was nearly HUF 7,000 taking account of the total card purchase turnover, it amounted to less than HUF 4,800 in the case of contactless purchases.

#### Box 1

##### Card purchases abroad – why do they cost more?

**In 2016, there was a sharp rise in the use of cards abroad, but transactions carried out in other countries still account for a small portion of total purchase turnover.** In 2016, the increase in card purchase turnover abroad was stronger than in any previous period: the number of transactions grew by one-third, while their total value was nearly 21 per cent up compared to the previous year. The amount of approximately HUF 465 billion spent on some 38 million occasions meant an average value of HUF 12,000, which is much higher than in the case of card purchases in Hungary. In spite of the significant rise in turnover, payments abroad using cards issued in Hungary accounted for only 7 per cent and 12 per cent of the total turnover in terms of the number and value of transactions, respectively. In the case of cash withdrawals, a lower increase, exceeding 2 per cent, took place in the number of transactions, while the total value declined to a similar extent. Accordingly, more than HUF 80 billion was withdrawn in about 1.4 million transactions during the year.

**In certain cases, card use abroad is still much more expensive and this may have an unfavourable impact on the growth in turnover.** In the case of card use abroad, either for shopping or cash withdrawal, usually firstly the card company carries out an exchange rate conversion, and sends the transaction amount converted typically to euro or US dollar to the cardholder's bank. If necessary, the issuing bank changes this amount to the currency of the account, and thus in many cases double or even multiple conversions take place. For example, if we purchase something in Croatia using our card that is linked to a forint account, the amount of the purchase expressed in Croatian kuna is usually converted by the card company to euro, and then our issuing bank converts this euro amount to forint. In the case of cash withdrawal by card abroad, a cash withdrawal fee is typically added to the conversion costs. It is also important to note that the date of settlement may be several days different from the date of the given transaction; therefore, changes in exchange rates may entail risks for the customers. In the case of an unfavourable shift in the exchange rate, the customer's costs may increase further.

**In addition to higher costs, consumers may be affected by payment service providers' insufficiently transparent pricing as well.** Some banks do not indicate exactly what conversions the card companies carry out in the case of a given currency, and several banks perform multiple conversions, i.e. the euro or dollar amount sent by the card company is first converted to forint, then it is converted to the currency of the foreign currency account instead of immediately changing the amount received to the currency of the foreign currency account. The practice of settlement varies at the card companies as well; in some cases the same card company changes the amount of the transaction to euro and at another time to dollar. Moreover, in some cases the card company converts to forint and sends that to the bank.

**Conscious consumer behaviour may reduce the costs of using a card abroad.** Consumers who have a foreign currency account can typically use their cards with a lower fee burden abroad as well, i.e. if, for example, we purchase something in a euro-area member state using our card related to our euro account, usually there is no conversion. Some banks allow the changing of the account related to a given card, i.e. before a trip it is possible to connect the card to an account held in another currency instead of the forint account, and then restore the relationship with the original forint account after arriving home. This solution also exempts the consumer from the payment of further card fees (e.g. issuance fee, annual fee) related to foreign currency accounts. Some foreign ATMs allow so-called dynamic currency conversion, when the consumer is offered a fixed conversion rate, terminating the risk of a conversion at an even worse exchange rate until the conversion that takes place some days later, should FX market developments become less favourable. At the same time, upon using this service, the fixed rate is usually less favourable than the current exchange rate. Therefore, it is primarily worth choosing it if the cardholder considers a shift in the forint exchange rate in the negative direction by the time of the later conversion to be a significant risk.

### 1.1.2 EFFICIENCY OF DOMESTIC PAYMENTS IN INTERNATIONAL COMPARISON

As a result of the past years' improvements, the efficiency of payments in Hungary increased dynamically in each area under review compared to the previous year, and is rapidly approaching the European average (Table 1). In 2016, each of the three indicators that characterise the level of development of the Hungarian payment system rose considerably compared to the previous year, and the observed lag behind the average of the European Union also declined significantly. Payments in Hungary are the closest to the EU level in the area of credit transfers. The annual amount of these transactions was more than 16 times the value of GDP, just slightly below the EU ratio of 17.6, which serves as a reference value.

The unbroken rise in card payment turnover observed in the past years was also reflected in the considerable increase in the indicator of the electronic turnover of retail purchases. The indicator 'electronic payment of retail purchases' rose considerably, by 3.3 percentage points, which is primarily attributable to the nearly 25 per cent annual growth rate of the turnover of purchasing by payment card. The value of the indicator practically doubled in four years. At the same time, it also means that while in 2012 the ratio in Hungary was about one-third of the EU average, as a result of past years' development, in 2016 it already reached nearly two-thirds of the European reference value, which means that Hungary already worked off half of its backlog compared to the

EU average. One of the most important factors in the favourable changes is the spread of the contactless technology in the case of purchases by card.

Significant progress of some 9.2 per cent was achieved in the area of electronic bill payments as well. In the past two years, the ratio of electronic bill payments rose from 25 per cent to nearly 40 per cent. This was because the ratio of electronically paid bills rose considerably mainly as a result of recent improvements implemented by the Hungarian Post, such as widely providing the opportunity of card payment at post offices or the introduction of mobile payment. Due to the popularity of the extremely widespread postal payment order (yellow or white), which can be considered a Hungarian speciality, the value of the indicator is still very low in European comparison, but the growth rate is promising. Another important electronic method of bill payments is constituted by direct debits, the turnover of which increased to a greater extent than in the previous years, i.e. by nearly 3 per cent compared to 2015.

### 1.1.3 FRAUD RELATED TO ELECTRONIC PAYMENT TRANSACTIONS

In 2016, the number of fraud events related to payment cards and the value of the damage caused by such events increased. At the same time, their ratio compared to total turnover remains extremely low (Chart 5). In the first three quarters of the year, on the issuer side, some 25,000 fraud events caused losses amounting to more than HUF 836 million in total, representing a year-on-year

**Table 1**  
Changes in indicators measuring the level of development of Hungarian payment systems compared to the EU  
(2012–2015)

Indicator	Calculation method	Hungary					European Union
		2012	2013	2014	2015	2016	2015
Credit transfers	Annual value of credit transfers / GDP	13.6	13.6	14.3 <sup>1</sup>	14.7 <sup>1</sup>	16.2	17.6
Electronic payment of retail purchases	Annual value of payments made by payment cards and other electronic solutions / Annual household consumption	11.8%	13.0%	14.8% <sup>1</sup>	17.4% <sup>1</sup>	20.7%	32.0%
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%	29.7% <sup>1</sup>	38.9%	70% <sup>2</sup>

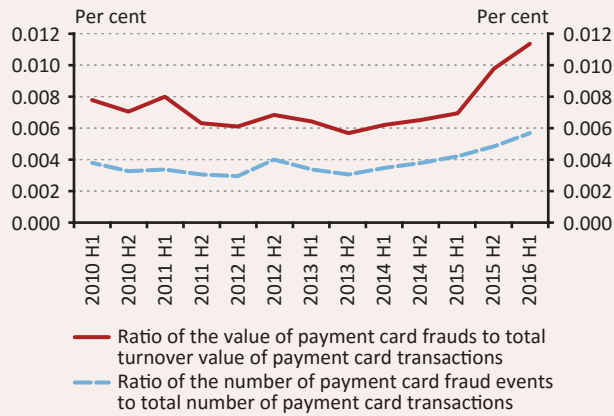
<sup>1</sup> Deviation from previously published data due to data supplier modifications.

<sup>2</sup> Estimated value based on per capita direct debit figures of EU countries and central bank analyses.

Sources: MNB. ECB. Eurostat.

**Chart 5**  
Ratio of fraud and related losses to total payment card turnover on the issuer side

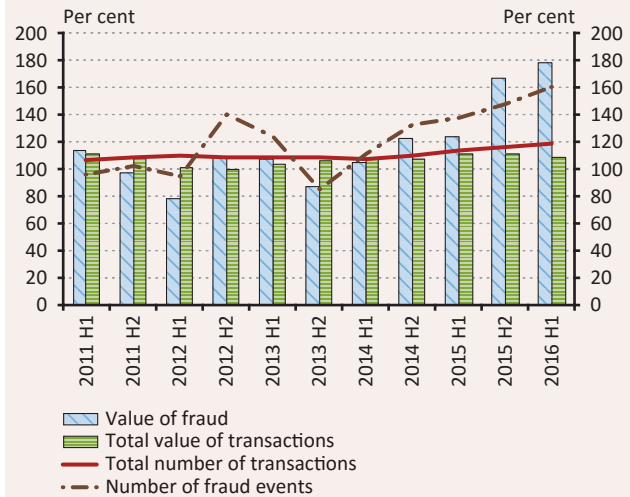
(2010–2016)



increase of approximately 50 per cent both in terms of the number of cases and value (Chart 6). However, compared to the total payment card turnover the number of fraud events is still negligible. In 2016 H1, frauds accounted for less than 0.006 per cent of transactions and 0.01 per cent of the total value. The number of frauds committed in the domestic acceptance network and the value of the damage caused show an even more favourable picture than on the issuer side. In the first three quarters of the year, some 2,800 fraud events resulted in a loss of HUF 132 million. It is also important to note that on the acquirer side at the POS terminals there was no

**Chart 6**  
Year-on-year changes in the transactions using cards issued in Hungary vs. in the number and value of the fraud events related to their use

(2011–2016)

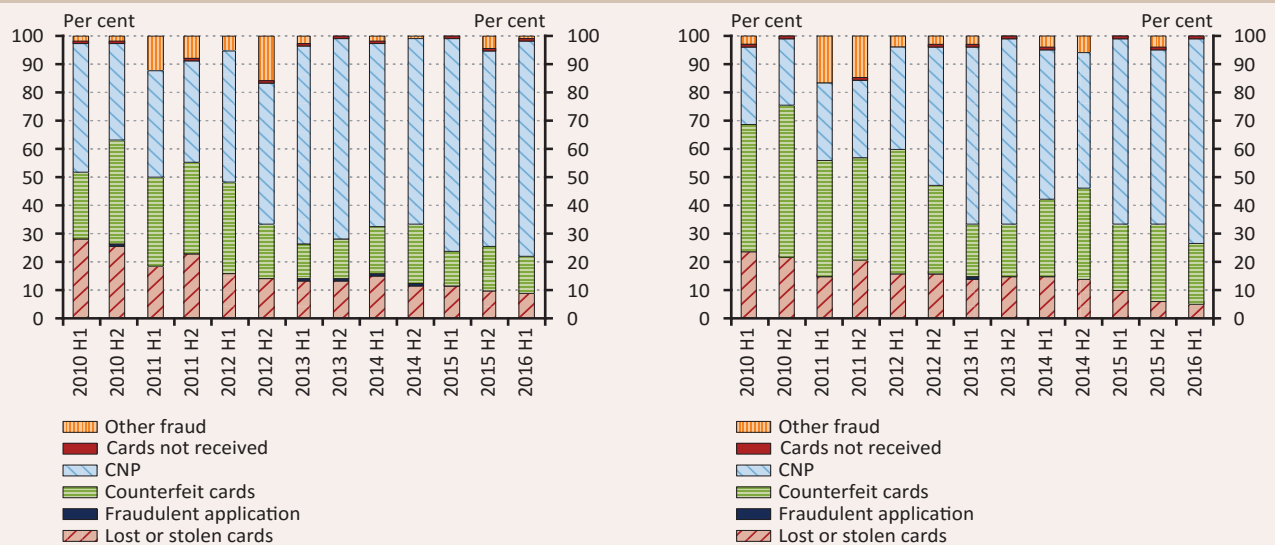


fraud related to the contactless function of cards, i.e. the new technology, which accounts for more than half of the payment card turnover, can be considered extremely safe.

**In terms of their direction, payment card frauds primarily affected cross-border turnover, while in terms of the types of fraud they mainly concerned online purchases (Chart 7).** Card frauds showed similar features on the issuer and acquirer sides; most of

**Chart 7**  
Distribution of the number and value of fraud events related to payment cards issued in Hungary by fraud category

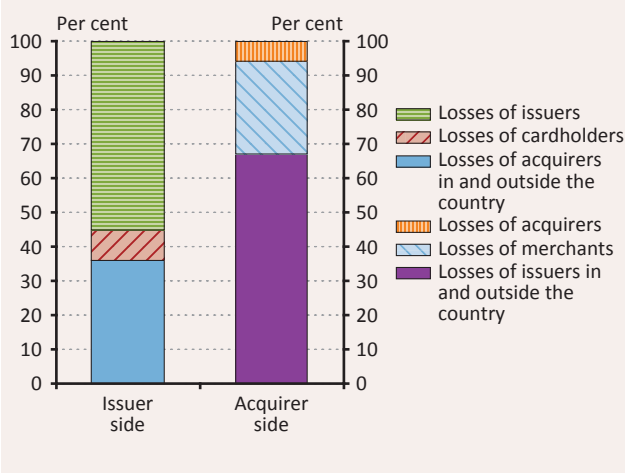
(2010–2016 H1)



the damage caused (some 80 per cent) concerned cross-border turnover. As far as the types of frauds are concerned, the ratio of frauds increased in the case of card-not-present<sup>3</sup> (mainly online purchase) transactions (and especially the value of the damage caused was up), accounting for more than 72 per cent of the damage caused in 2016 H1, which shows a 7 percentage point rise year on year.

**As a result of the legislative background that primarily protects consumers' interests, less than one-tenth of the issuer side losses burdened cardholders.** (Chart 8). In the first three quarters of 2016, the loss charged to cardholders accounted for 9 per cent, i.e. less than HUF 70 million, of the total issuer side damage. More than half of the issuer side loss, i.e. HUF 426 million was incurred by card issuing payment service providers, while the loss of foreign or domestic acquirers exceeded one-third (HUF 277 million) of the total damage. Two-thirds of the total loss of HUF 123 million written off on the acquirer side burdened the card issuers, while some HUF 34 million, i.e. around one-quarter of the losses had to be borne by domestic retailers.

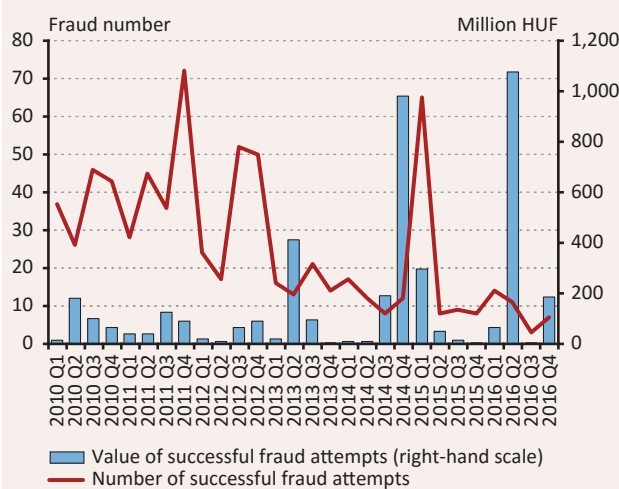
**Chart 8**  
Losses written off in relation to payment card fraud on the issuer and acquirer sides  
(2016 Q1–Q3)



**Both the number of frauds committed in other electronic payments and the value of the related loss caused were negligible compared to total turnover** (Chart 9). Compared to the previous year, in 2016 the number of frauds in the non-card electronic payment

turnover fell to around one-third, i.e. there were 35 cases. However, the value of the damage caused increased, although the loss of HUF 1.3 billion is only a fraction of the total credit transfer and direct debit turnover. Accordingly, as a result of the many security measures and improvements applied by payment service providers, the risk of fraud affecting consumers can be considered minimal.

**Chart 9**  
Number and value of fraud events in electronic payment transactions  
(2010–2016)



Note: The chart excludes data on payment card fraud.

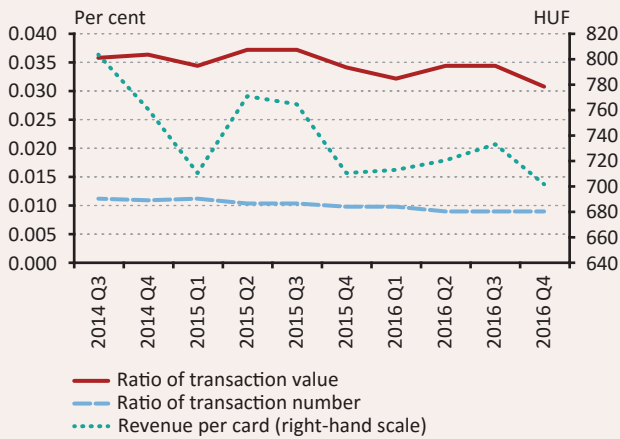
### 1.1.4 PAYMENT TRANSACTION REVENUES AND THE PRICING OF PAYMENT SERVICES

Compared to turnover, the revenues of financial institutions from payment services continued to decline in 2016, i.e. the use of state-of-the-art electronic payment methods is becoming cheaper and cheaper for consumers (Chart 10). In 2016, financial institutions' income from the provision of payment services amounted to more than HUF 472 billion, and the 0.2 per cent rise compared to the previous year is much lower than the growth rate of electronic payment turnover. Service providers collected about half of the revenues through pricing proportional to value, which is partly attributable to the transaction levy burdening banks. The ratio of revenues related primarily to a given period

<sup>3</sup> Card-not-present (CNP) transactions

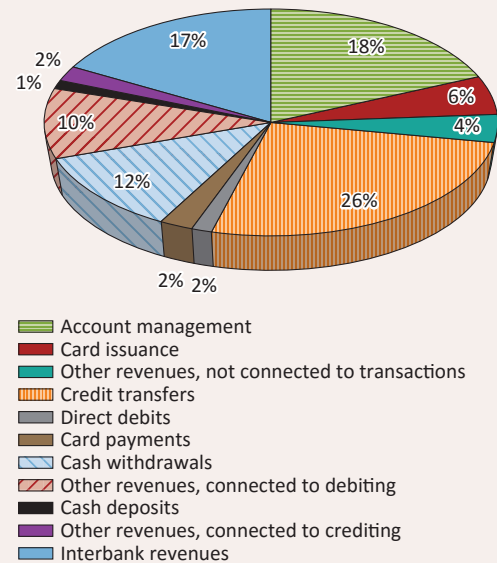
**Chart 10**  
Ratio of payment transaction revenues as a proportion of the number and value of transactions compared to turnover and the revenue related to card issuance per payment card

(2014 Q3 – 2016 Q4)



**Chart 11**  
Breakdown of revenues related to payment services by revenue type

(2016)



(e.g. account management fee or annual fee of payment cards) was 30 per cent, while revenues proportional to the number of transactions accounted for 20 per cent. Compared to turnover, the revenues from fees proportional to the number and value of transactions declined in the past years. Accordingly, the use of state-of-the-art payment methods represents a declining material burden on consumers. Similarly, revenues from card issue per payment card were also down, i.e. access to payment cards is becoming easier for consumers.

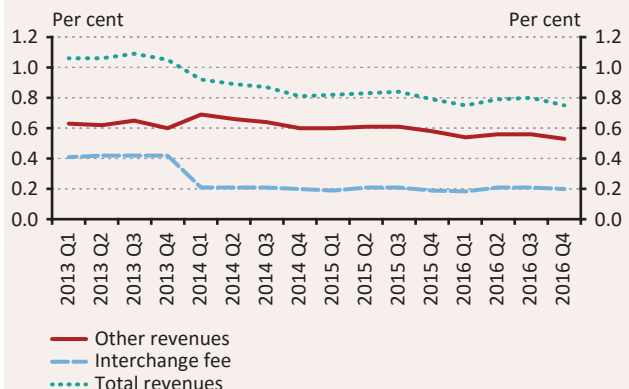
**Of payment services, credit transfers and account management fees represent the most important revenues for the financial sector** (Chart 11). The revenues related to credit transfers (nearly HUF 125 billion) exceeded one-quarter of all payment transaction revenues in 2016, which is primarily attributable to the fact that credit transfers constitute the electronic payment method that moves the highest transaction value, and payment service providers' pricing is also typically based on pricing proportional to value. Fees related to account packages and account management also have a considerable share with some HUF 87 billion collected from customers during the year.

**1.1.4.1 The costs of payment card acceptance**

**As a result of regulating the interchange fees, merchants' costs related to card acceptance declined. The actual changes in these costs are continuously monitored by the MNB.** The domestic and European regulation of interchange fees aimed at supporting the

**Chart 12**  
Ratio of revenues from card acceptance service to turnover of purchases by payment cards

(2013–2016)



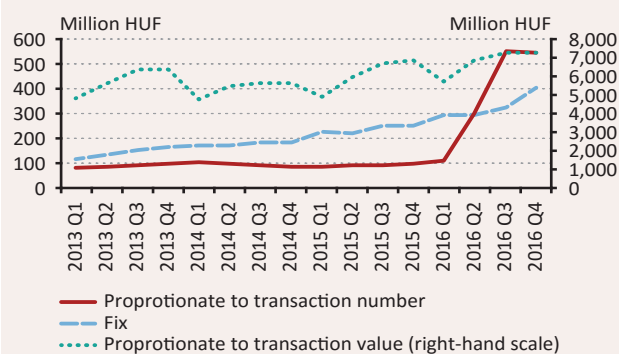
expansion of the payment card acceptance network; the regulation can make its actual impact through a decline in card-accepting merchants' fee burden. The impact of the Hungarian regulation introduced in 2014 and of the European Interchange Fee Regulation that entered into force in 2015 on the payment card market is continuously monitored by the MNB. The first analyses show (Chart 12) that payment service providers' card acceptance related revenues as a proportion of turnover were down in terms of the total revenue as well as the collected interchange fees, i.e. the fee burden of merchants declined.

**The steadily rising ratio of the fees charged by payment service providers in relation to the number of transactions may have an unfavourable impact on the development of the Hungarian payment card market** (Chart 13). In 2016, payment service providers recorded income of nearly HUF 30 billion relating to the payment card acquirer service. Service providers primarily charge fees that are proportionate to the value of the transaction to merchants; this category accounted for more than 90 per cent of all revenues from card acceptance. The ratio of payment service providers' fixed revenues, mainly from the selling or renting of POS terminals, is less than 5 per cent. At the same time, in the case of merchants with lower card turnover the share of such fees within all costs may reach as much as 30 per cent, i.e. for smaller merchants the renting or buying of terminals represents a much higher cost compared to the fees burdening larger merchants. In addition, as of 2016, revenues as a proportion of the number

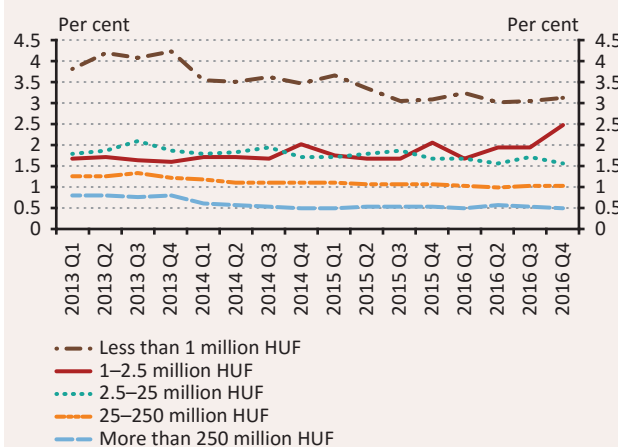
of transactions increased significantly, which may be disadvantageous from the aspect of the further expansion in the acquirer infrastructure. Fees as a proportion of the number of transactions burden low-value purchases to a greater extent, and thus hinder the computerisation of low-value payments, which are mainly performed in cash. Moreover, as the ratio of lower-value transactions is typically higher in the case of the merchants that belong to the lowest turnover category, merchants that do not yet accept cards are less motivated to introduce the possibility of electronic payment.

**The specific fee burden on merchants with lower card turnover remained high, in spite of the changes in regulations in the past years** (Chart 14). Grouping the card accepting merchants on the basis of their respective card purchase turnovers reveals that – in the case of merchants with a lower turnover – the fee burden compared to turnover is much higher. While in the case of the largest merchants the fees as a proportion of turnover paid to payment service providers are around half per cent, this ratio exceeds 3 per cent for their smallest competitors. The higher fee burden remained in spite of the fact that the entry into effect of the interchange fee regulation at the beginning of 2014 resulted in the strongest decline in fees as a proportion of turnover in this category of merchants. If the significant distinction between merchant groups proves to be persistent, further steps by the MNB and

**Chart 13**  
Changes in revenue types related to the payment card acquirer service  
(2013–2016)



**Chart 14**  
Ratio of revenues compared to the card payment turnover in merchant categories according to quarterly card turnover  
(2013–2016)



other authorities may become necessary in order to address this unfavourable situation.

### 1.1.4.2 Pricing of retail payment services

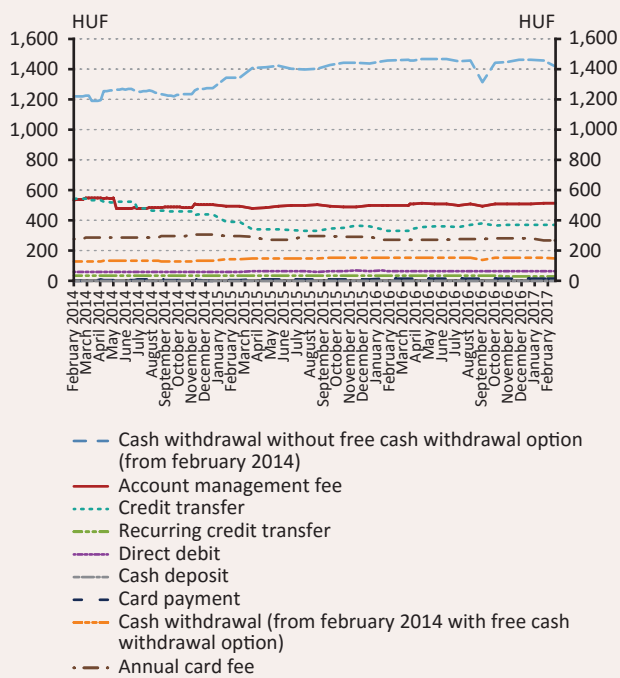
In order to encourage the use of electronic payment solutions and thus to increase the efficiency of payment transactions, the MNB still considers it important to continuously monitor the payment service fees charged to retail customers. The fee for payment services has a significant impact on the spread of electronic payment solutions and new, innovative services. In the near future, changes in regulations or developments may have an effect on retail fees. Amongst other things, the impacts of transposing the new Payment Services Directive and the Payment Account Directive deserve mention,

as well as the introduction of the instant payment service, which boosts competition, and thus may result in lower fees. Through the pricing monitoring system, the MNB continues to keep track of the changes taking place in the pricing of retail payment services.

**Retail customers' payment costs remained practically unchanged in 2016.** Since the introduction of the two free cash withdrawals a month in 2014, payment transaction costs have become stable in Hungary. Similar stabilisation developments are observed in the changes in monthly payment costs by service type (Chart 15). Although in the case of certain services slight fee increases occurred occasionally, negative price change trends concerning the individual customer segments under review<sup>4</sup> cannot be observed (Chart 16).

**Chart 15**  
Changes in average monthly payment costs of retail customers by type of service

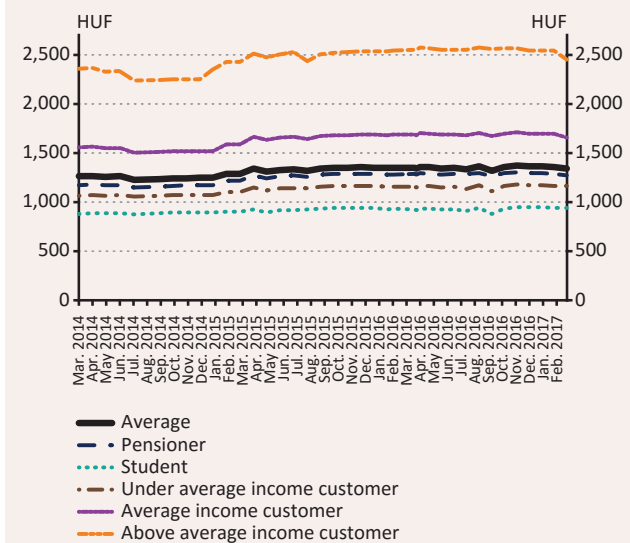
(February 2014 – February 2017)



Note: Calculated with 2014 turnover.

**Chart 16**  
Changes in average monthly payment costs of retail customers by customer segment

(March 2014 – February 2017)



Note: calculated with 2014 turnover.

<sup>4</sup> For the analysis, customers were classified into categories on the basis of their life situations and monthly remuneration. Accordingly, five groups were set up: customers with minimum wage, average and above-average salaries as well as student and pensioner customers. In addition, we also examined the average cost calculated from these customer groups' payment costs.

## 1.2 Improvements in financial infrastructures implemented in 2016

### 1.2.1 KELER'S MIGRATION TO T2S

**KELER successfully joined the TARGET2-Securities (T2S) pan-European securities settlement platform on 6 February 2017, allowing a pick-up on the demand side of the domestic securities market and the expansion of the European securities supply accessible in Hungary.**<sup>5</sup> In line with the migration schedule of the T2S project, by February 2017 eighteen European central securities depositories joined the platform, allowing a decline in the fees of cross-border operations carried out with the securities issued at them. Although another four central securities depositories are still to join, in February 2017 the average daily number of transactions settled in T2S reached 480,000, coming close to the expected maximum of 550,000. The importance of the fourth wave of migration going live on 6 February is well reflected by the fact that prior to this migration – in January 2017 – the daily average number of transactions was only 234,296.<sup>6</sup> In addition to KELER, the central securities depositories joining on 6 February included the Slovakian CDCP, the Slovenian KDD, LuxCSD of Luxembourg, the Austrian OeKB CSD and Clearstream Banking, Germany, which has the largest volume among them. With the migration of this latter central securities depository, both major continental securities markets, i.e. the French and German securities became accessible in T2S, so the part of the migration that posed the greatest challenge has already taken place. Following the migration of central securities depositories, the maximum utilisation of the possibilities provided by the platform comes to the fore, directing attention to the development of international relations among central securities depositories. The technical and legal environment provided by T2S allows for the efficient, cheap performance of cross-border securities transactions through the links between T2S central

securities depositories, which is expected to result in a decline in end-investor fees. Accordingly, of the business possibilities available for the central securities depositories that have joined the system, the establishment of international account relationships and their inclusion in T2S are the most important ones, as T2S is able to completely fulfil its designated role only if this takes place. KELER's migration has made it possible for Hungarian securities to become available for a wider range of international investors, and in the long run the resulting increase in demand is expected to lead to a decline in Hungarian companies' costs of raising funds.

**As a result of joining T2S, in some of KELER's relations established with foreign securities depositories the value-added services of T2S already prevail.** Prior to the T2S migration, KELER had six links with other central securities depositories; the possibility of using T2S arose in the case of three of them, namely the bilateral relation with the Swiss SIX SIS and the unilateral one with the OeKB CSD. Simultaneously with the migration, the existing relationship with the OeKB CSD became a T2S link, in which the OeKB CSD and KELER were registered as investor central securities depository and issuer central securities depository, respectively. The latter means that through its securities account opened with KELER the OeKB CSD can mediate the Hungarian securities issued in KELER to its own clientele. As a result, purchasing and holding Hungarian securities has become more efficient for Austrian investors. All of this has a favourable impact on demand for domestic securities, which may contribute to the decline in the costs of raising funds. At the same time, it is important that further links should be established between KELER and European depositories, as this allows domestic securities market participants to benefit from the advantages of T2S to an even greater extent. In addition, it is also of high

<sup>5</sup> More information on T2S: Gergely Patrik Balla: *A TARGET2-Securities működése és a hazai értékpapírpiacon gyakorolt hatása (The operation and impact of TARGET2-Securities on the Hungarian securities market)*; in: MNB Tanulmányok (Occasional Papers), MT128, 2017; <https://www.mnb.hu/kiadvanyok/elemezsek-tanulmanyok-statisztikak/mnb-tanulmanyok/mnb-tanulmanyok/mt-128-balla-gergely-patrik-a-target2-securities-mukodese-es-a-hazai-ertekpapirpiacra-gyakorolt-hatasa>

<sup>6</sup> [http://www.ecb.europa.eu/paym/intro/news/articles\\_2017/html/201703\\_article\\_1\\_t2s\\_doubles.en.html](http://www.ecb.europa.eu/paym/intro/news/articles_2017/html/201703_article_1_t2s_doubles.en.html)

importance that in parallel with KELER's migration to T2S, the Hungarian forint did not become a settlement currency on the platform, which means that the value-added cash-side services of T2S did not become available in forints. Accordingly, expanding the access routes, i.e. increasing the number of links, arises as a strategic goal for KELER, while it is up to the MNB's discretion whether to take the Hungarian currency to the platform. These two directions of development could ensure the availability of all of the functions of T2S and the ensuing benefits for domestic investors and securities issuers.

**In addition to supporting the opening towards international markets, KELER's T2S project may create a basis for the provision of new services as well, for example bringing significant innovations in the area of handling corporate actions.** In parallel with joining T2S, KELER introduced its compensation services related to corporate actions, which can be used for securities transactions settled against euro. The introduction of these services took place in line with the European harmonisation efforts, and they cover three new functions: market claim, transformation and buyer protection. In the cases when the physical and legal owners of a security become temporarily separated from one another, these services allow carrying out the corporate actions arising in the meantime in line with the legal owner's interests. All of this means that even in the case of a transaction pending during a possible dividend disbursement, equity swap or voting, the legal owner's standpoints can prevail. In addition to these functions, further value-added T2S services will also become available as soon as KELER finishes its Strategic Modernisation Programme, which runs in parallel with its T2S project, and puts its relevant system elements into service by end-2017.

## 1.2.2 JOINING THE SINGLE EURO PAYMENTS AREA

**As a result of the developments in the field of euro payments, Hungarian payment service providers and their customers also joined the Single Euro Payments Area as of November 2016.** Starting from that date, domestic and foreign credit transfers and direct debits denominated in euro must be carried out in accordance with common standards and technical requirements according to the SEPA

End Date Regulation. As a result, payment service providers' customers in Europe can execute their euro payments similarly to domestic payments in terms of safety, speed and efficiency, using one single payment account held in the Union. The MNB continuously followed the progress of the SEPA preparations so that the changeover to SEPA payments could take place on time. Following the migration deadline, at the request of the MNB, the Hungarian Banking Association confirmed the completion of the changeover to the requirements in a declaration. As a result of the developments it can be established that the majority of payment service providers provide the SEPA credit transfer service for their customers. Only a few banks deal with or plan to provide the SEPA direct debit service for their customers. Payment service providers typically do not undertake to launch SEPA direct debit; accordingly, they tend to provide this service only on the receiving side. Based on the payment service provider data collected by the MNB, in the last quarter of 2016 the number of SEPA euro credit transfers rose by 10 percentage points (to 84 per cent) compared to the previous quarter.<sup>7</sup> By the end of the year, on the receiving side the share of SEPA euro credit transfers within all euro transfers reached 86.4 per cent in terms of volume, while on the sending side it exceeded 80.3 per cent. Credit transfers in a non-SEPA format mean the large-value TARGET2 transfers and the euro transfers performed with non-SEPA countries; their total number is about 16 per cent.

## 1.2.3 THE NEW SERVICE OF GIRO RELATED TO SWITCHING PAYMENT ACCOUNTS

**The GIROBankváltás (GIRO's bank switching service) facilitates the carrying out of the one-stop switching of payment accounts required in the Government Decree on switching payment accounts.** Since October 2016, the Government Decree on switching payment accounts, which transposes the provisions of the EU's Payment Account Directive, has allowed consumers in Hungary to have access to the so-called one-stop payment account switching. It is sufficient if the consumer indicates his request to switch payment accounts to the payment service provider where he intends to open his new payment account, either with or without demanding the simultaneous closing of his previous payment account. Then the new account providing payment service provider contacts

<sup>7</sup> <http://www.mnb.hu/en/statistics/statistical-data-and-information/statistical-time-series/xiv-payment-systems/payment-data>

the previous account maintaining payment service provider in order to receive the data related to the payment orders (regular credit transfers and direct debits) and payment transactions (e.g. wage payment by the employer) specified by the consumer. It is the consumer who decides which payment orders or payment transactions he would like to link to the new payment account, or which ones he leaves unchanged in the case of keeping the previous payment account. Within a maximum of 12 working days following notification of the request, the payment orders given by the consumer must be executed in a way as if they were given to debit of the new payment account, while specified payment transactions received to credit of the previous payment account already have to be

received to the credit of the new payment account. GIRO made available its service called GIROBankváltás for payment service providers as of 28 October 2016. It provides efficient and safe communication help to payment service providers involved in payment account switching to be carried out according to the new rules. The use of the IT application run by GIRO is able to significantly reduce the operational tasks burdening payment service providers by providing a user-friendly interface to be filled out, a possibility to send attached documents and other functions that facilitate data entry. The transfer of consumer data necessary for the switching of payment accounts between two payment service providers concerned takes place through a closed, highly secure channel.

## 1.3 Operation of financial market infrastructures

In 2016, the number of transactions executed in the overseen systems increased by 2 per cent, while compared to the previous year the value of the related turnover declined by 3 per cent on average. On the whole, GDP-proportionate annual turnover amounted to 41.29 times the annual GDP (Table 2). In 2016, the ICS and KELER saw an increase in turnover, while turnover for VIBER declined. There was no major change in the number and value of capital market transactions cleared by KELER CCP. In the ICS, the number of individual transactions<sup>8</sup> increased by 2.9 per cent,<sup>9</sup> and 6.4 per cent increase was observed in value. The expansion in clearing transactions varied significantly across transaction types: the increase in the number of individual credit transfers was three times the number of bundled transactions. The turnover of KELER Ltd. was up significantly, rising by more than 50 per cent both in terms of the number of transactions and their value. The increase is mainly attributable to the rise in the number of transactions with HUF-denominated government bonds and mutual fund units. The 11 per cent decline in the total value of the turnover in VIBER was partly the result

of a fall in the value of bank-to-bank transactions as well as the phasing-out of the two-week deposit and the decrease in overnight deposits placed with the MNB, which could not be offset by the expansion in customer transactions or the increase in the value of the three-month deposit and of the transactions related to the cash leg settlement of securities transactions. As opposed to the decline in the value of VIBER transactions, transaction volume was up 5 per cent, mainly reflecting an increase in customer transactions, three-month central bank deposits and transactions related to the doubled clearing cycle frequency of the ICS intraday clearing.

**As an overseer, the MNB continuously monitors the risk exposure of financial market infrastructures.** In this context, it monitors, assesses and analyses the service continuity risk, the clearing and settlement risk and the system operational interdependency risk as well as the changes in other criteria affecting efficient operations. The requirements laid down in the new international oversight principles (PFMI) have also been integrated into the evaluation methodology.

**Table 2**  
**Turnover and main figures of the financial market infrastructures**  
(2015–2016)

Overseen systems		Volume (thousands)		Value (HUF thousand billion)		Turnover/GDP		Participants in 2016	
		2015	2016	2015	2016	2015	2016	direct participants	indirect participants
VIBER		1 472	1 545	1 248.4	1 113.1	37.11	31.79	46	71
ICS	overnight clearing	110 340	100 664	16.8	13.7	0.49	0.39	38	88
	intraday clearing	173 847	190 176	74.1	82.9	2.02	2.37	38	88
KELER CSD		538	855	156.2	240.6	4.46	6.87	146	n.a
KELER CCP		10 147	9 456	5.3	5.1	0.15	0.14	131	n.a

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

<sup>8</sup> Rejected transactions, queued transactions and refunded transactions are not included.

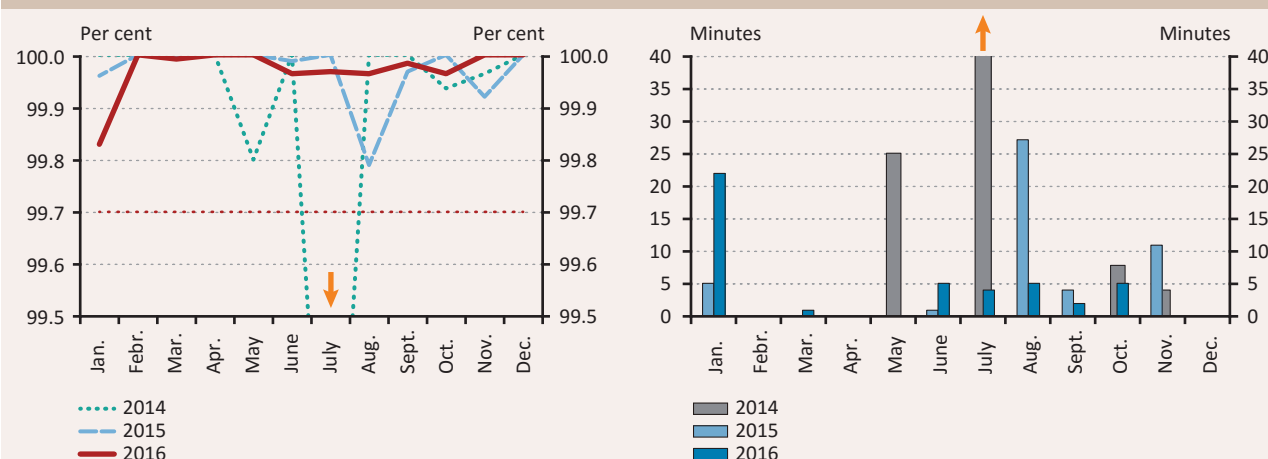
<sup>9</sup> The number of individual transactions in that case include the non-clearing transactions of the ICS overnight clearing.

The operation of the overseen systems was highly reliable in 2016, efficiently and safely executing the participants' transactions and thus supporting the functioning of the financial and capital markets. The availability of VIBER, KELER and KELER CCP improved compared to the previous year, but that of the ICS deteriorated slightly. On the whole, the operational risk declined in the overseen systems, mainly as a result of the decrease in the number and duration of incidents. In 2016, as a result of the robust operation of the systems, the system operational interdependency risk remained at a low level during the whole year. The CLS and T2S financial infrastructures, which are under international cooperative oversight with

the participation of the MNB, operated safely and efficiently, similarly to the domestic systems.

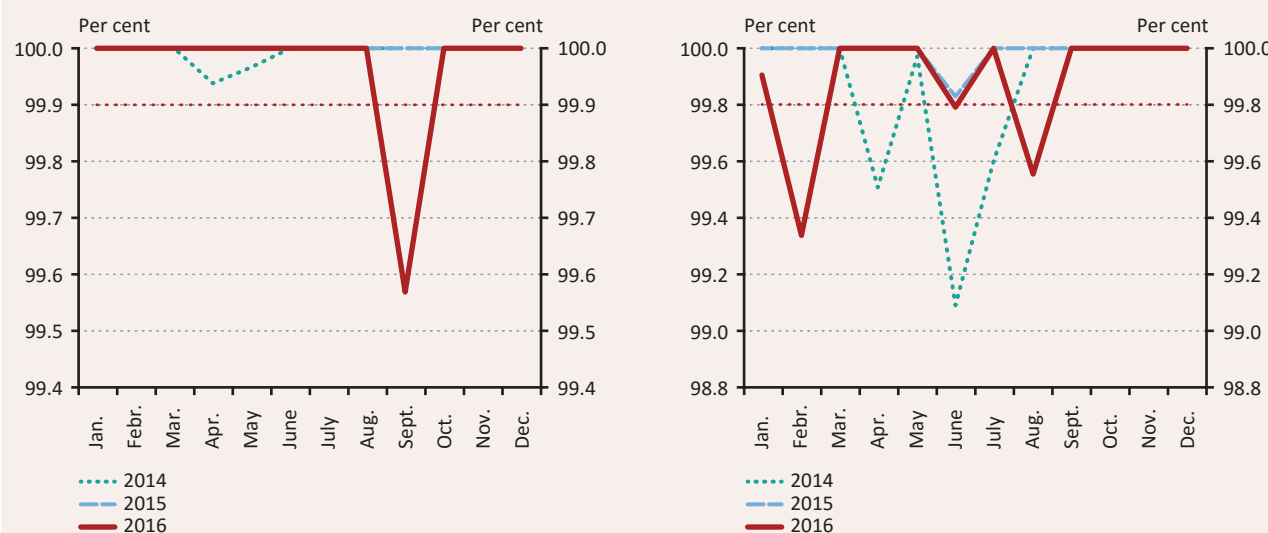
As in previous years, VIBER demonstrated a high degree of reliability in 2016; the risk of service continuity decreased further. As opposed to previous years, the monthly availability ratio of the core settlement service did not drop below the 99.7 per cent level expected by the domestic oversight practice in any month of the year (Chart 17). Compared to 2015, in 2016 the total number of outages of the core settlement service increased due to telecommunication network failures on several occasions, but these outages lasted for 1–5 minutes,

**Chart 17**  
**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)**  
 (2014–2016)



Note: In July 2014, availability was at 98.8 per cent, while the service was unavailable for 162 minutes.

**Chart 18**  
**Impact of overnight (left-hand chart) and intraday (right-hand chart) clearing incidents on availability**  
 (2014–2016)



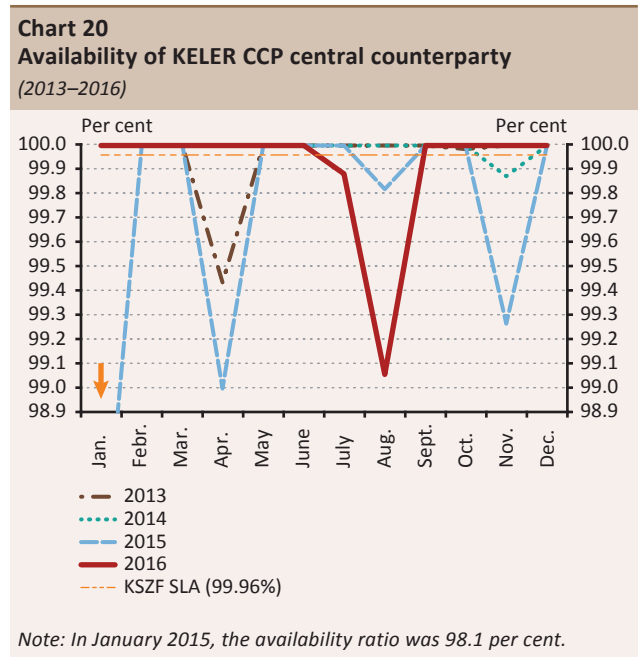
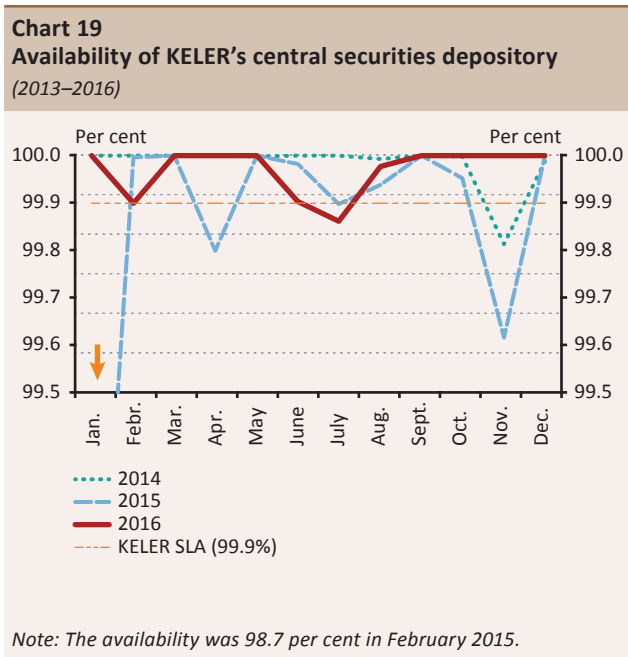
and thus the total duration of incidents slightly declined.<sup>10</sup> The time between the start and the end (recovery) of incidents also decreased similarly compared to 2015, with the longest downtime lasting for 22 minutes compared to 27 minutes in the previous year. The system operators prepared a detailed report, in which they drew the lessons from the incidents in order to prevent the recurrence of similar situations.

**The ICS overnight and intraday clearing operated in a reliable manner during the whole year, but the total availability of the system deteriorated compared to the previous year, with several incidents in H1. Nevertheless, banks did not need to take extraordinary measures.** Both clearing systems of the ICS processed the items very fast and with adequate efficiency, but in contrast with 2015, when the availability ratio<sup>11</sup> did not decline in any month below the undertaken service level, there were four months when this occurred in 2016 (Chart 18). The main underlying reasons for the six incidents in 2016 – two of which affected the overnight and four the intraday clearing – were internal operating errors as well as application failures.

**According to KELER’s calculations, the number and duration of incidents perceptible for customers declined; in 2016 the securities depository operated with outstanding availability for customers.** Compared

to 2015, the availability of KELER’s services for customers improved considerably. As a result, last year there were 11 months when it was able to reach the expected 99.9 per cent level (Chart 19). This is the result of the considerable decline compared to 2015 in the number and duration of the incidents affecting the IT systems that support the business activity. Nevertheless, KELER overcame the incidents in a professional manner and in a shorter time than before. In addition, the introduction of KELER’s new account management system planned for 2017 and the measures taken as a result of the investigation of the incidents are expected to contribute to increasing the harmony of the currently fragmented IT infrastructure and preventing the recurrence of faults in the future.

**According to the calculations of KELER CCP, the level of providing its business services increased considerably compared to 2015, as a result of which it continued to ensure high availability for customers.** There is an outsourcing agreement between KELER CCP and KELER for operating the IT systems. Under the agreement, the infrastructure required for the provision of central counterparty services is operated by the depository. Accordingly, the lower number and duration of the incidents affecting KELER’s IT system compared to 2015 had a positive impact on KELER CCP’s business activity as well. As a result, instead of the four occasions recorded in 2015, there were only



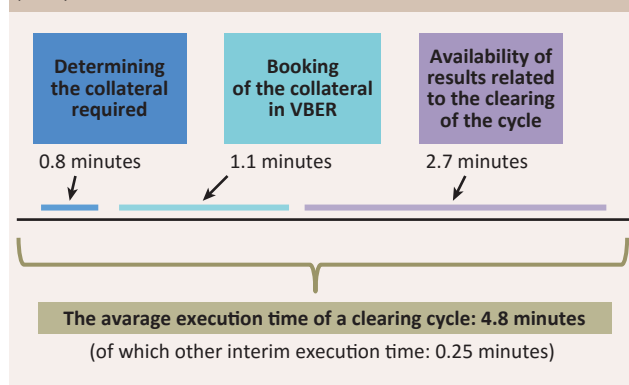
<sup>10</sup> On the whole, compared to the previous year, the aggregate duration of incidents resulting in the outage of the core settlement service declined by 4 minutes to 44 minutes, while the number of incidents was up from 5 to 10 in 2016.

<sup>11</sup> Monthly availability ratio: ((number of working days\*GIRO (night or intraday) opening hours – outage due to incident)/(number of working days\*GIRO (night or intraday) opening hours))\*100; ICS overnight clearing SLA 99.90 per cent; ICS intraday clearing SLA 99.80 per cent

two months when it was unable to fulfil the expected availability level of 99.96 per cent (Chart 20).

**The execution time of the clearing and settlement of transactions in the payment systems became shorter again in 2016 and 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.<sup>12</sup> If sufficient cover is available, bank-to-bank and customer transactions are executed in 12 seconds on average. Cash leg settlement of securities transactions and the margin calls of ICS intraday clearing require 15–16 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 management system of the MNB is also involved in the process. Responses to VIBER participants' inquiries were received within 17 seconds on average, and cancellations take about the same time. In 2015, right after the introduction of the 10 cycles, the average execution time<sup>13</sup> of a clearing cycle accelerated from 7 minutes and 38 seconds to 5 minutes and 42 seconds. The decline in the time requirements concerning the individual statuses of the clearing process continued in 2016 as well; as a result, the average execution time of a cycle decreased further reaching 4 minutes and 48 seconds (Chart 21). The significant acceleration is attributable

**Chart 21**  
Time requirement of the ICS intraday clearing process after the introduction of higher cycle frequency (2016)

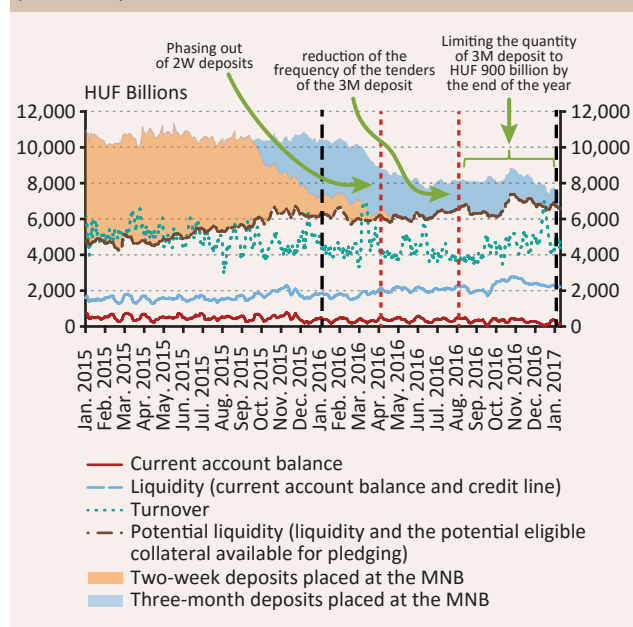


to the higher performance of the clearing system as well as to the fact that following the increase in the frequency of cycles there are fewer transactions cleared in one cycle. The maximum execution time without an incident did not exceed 30 minutes even in the first cycle, which processes the largest number of transactions. The other duration important from the aspect of ICS clearing is the time needed for determining the collateral amounts required for the execution in VIBER<sup>14</sup> of the transactions accepted for the given cycle. In 2016, it took 45 seconds on average, and it was around 56 seconds on average even in the cycle with the highest number of transactions.

### 1.3.1 CLEARING AND SETTLEMENT RISK IN VIBER AND THE ICS

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

**Chart 22**  
Changes in the account balance and liquidity, potential liquidity and turnover of VIBER participants (2015–2016)



<sup>12</sup> 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).

<sup>13</sup> 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.

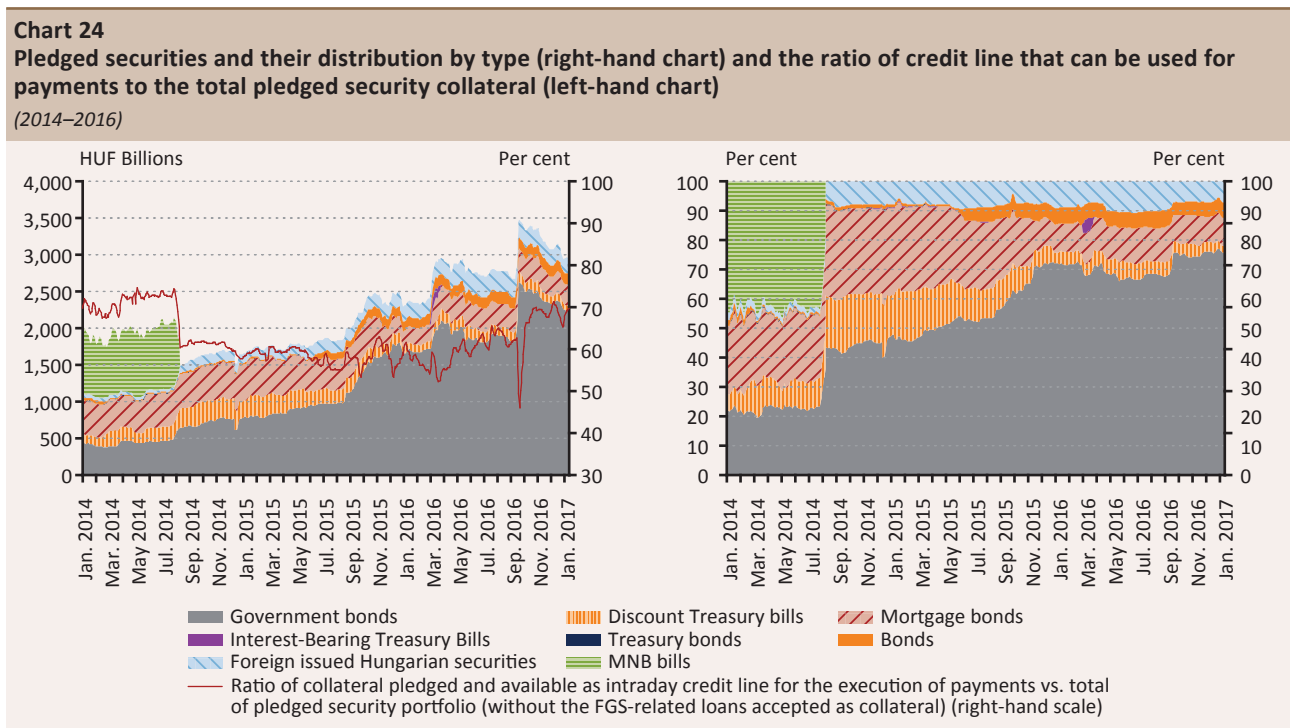
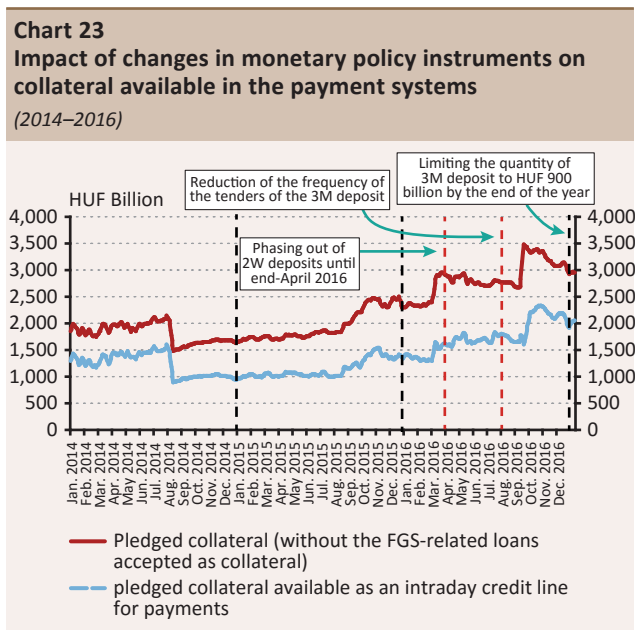
<sup>14</sup> Clearing in the ICS is considered executed when the debit balance of the participant is booked on its payment account with the MNB. This booking is based on the collateral amount which determines the amount to be debited to the payment account of a participant for its turnover in a given cycle. This collateral amount must be available as liquidity in VIBER.

execution of payments in both systems: their available account balance and the intraday credit line provided against their security portfolios pledged to the MNB.

### 1.3.1.1 Effect of factors determining the liquidity of VIBER and ICS participants

**Liquidity was sufficient for the execution of payment transactions both at the system and individual bank levels; as a result, clearing and settlement risk did not increase in the payment systems.** In 2016, basically two

factors had an impact on the liquidity and turnover of payment system participants: firstly, the refinancing from forints serving as the basis for the MNB’s self-financing programme and secondly, the central bank swaps expiring during the year in relation to the conversion into forints. In connection with the MNB’s self-financing programme, the phasing-out of the two-week deposit in April resulted in a change, mainly in the composition of payment liquidity, but the reduction of the frequency of the tenders of the three-month deposit in August and limiting its quantity to HUF 900 billion at end-December as well as the reduction of the required reserve ratio on 1 December also required adjustment from the participants. As a result of the fixed, 1 per cent required reserve ratio applicable to all members, on average, participants now hold a smaller account balance on their payment accounts held with the MNB. In order to offset this, the participants continuously increased their securities collateral during the year, resulting in a total increase in liquidity in the system by some HUF 600–800 billion (Charts 23 and 24). At the level of the banking sector as a whole, nearly 50 per cent of the liquidity becoming available during the phasing-out of the two-week deposits increased the holdings of government securities<sup>15</sup> within pledged security collateral. From HUF 1,700 billion at end-February, the holdings of pledged government bonds rose to more than HUF 2,100 billion by end-March. In the same period, the holdings of blocked discount treasury bills more than doubled from HUF 80 billion



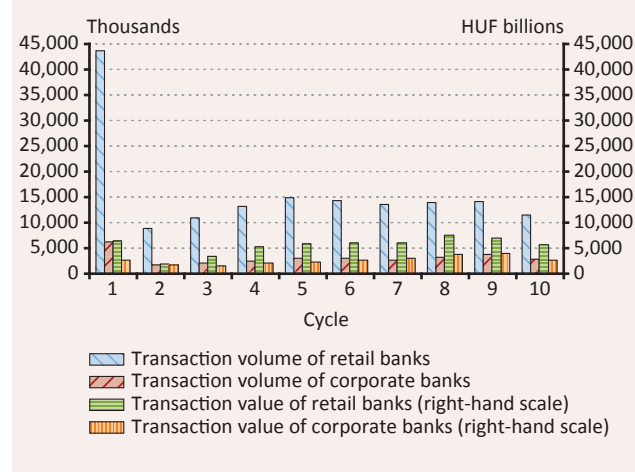
<sup>15</sup> Government bonds and discount treasury bills.

to around HUF 160–180 billion. In September 2016, the holdings of pledged government bonds increased by some HUF 800 billion, which may have been attributable to the reduction of the frequency of the tenders of the three-month deposit facility as of August 2016 and their subsequent quantitative restriction (Charts 23 and 24). The last three-month deposit tender without quantitative restriction was held on 21 September 2016, at which there was strong demand for this instrument,<sup>16</sup> and thus a significant amount of liquidity was withdrawn from the system by VIBER participants. As they would have been unable to ensure their daily turnover by reducing their account balance, they were increasingly compelled to use their intraday credit line and hence they pledged the collaterals needed for this. Accordingly, in 2016 the amount of credit line that could be used for payment purposes increased continuously at the system level. As a result, the level of payment liquidity rose from HUF 1,500–2,000 billion at the beginning of the year to some HUF 2,100–2,800 billion on average at the system level (Chart 24). As a result of this adjustment process, potential liquidity<sup>17</sup> continues to be at a high level. The value of VIBER participants' potential liquidity is nearly four times the value of their available liquidity. Consequently, they can use a significant additional liquidity buffer for carrying out their payment transactions. The three-month deposit holdings are also part of the assets held on participants' balance sheets, but they cannot be turned into potential intraday liquidity promptly, within the day, only upon maturity, and accordingly, these holdings cannot cover an ad-hoc rise in intraday liquidity needs (Chart 22).

**As a result of higher cycle frequency in intraday clearing, the more balanced and efficient distribution of intraday turnover contributed to a further reduction of clearing risk.** The increase in the frequency of clearing cycles has different impacts on retail and corporate banks, as due to the composition of their clientele they use the intraday system differently.<sup>18</sup> In the first cycle, the number of transactions submitted by retail banks is high, whereas the customers of corporate banks use the ten cycles rather evenly (Chart 25). The first cycle remained the one with the highest number of transactions, as this is when the – mostly retail –

credit transfers initiated after the end of the previous business day are processed. A significant portion of the turnover is concentrated in the eighth and ninth cycles, but considering that the turnover value of the given cycles practically halved, participants have to provide much less liquidity for performing the cycles. In 2015, with the introduction of the 10 cycles, on average, the debit turnover of intraday clearing fell below 2 per cent of the total liquidity available in the system at any given moment, and it remained this way in 2016 as a whole (Chart 25). In 2016, the debit-to-liquidity ratio increased mostly on tax payment days and during the traditional year-end spikes in turnover. However, even in the December period – which had been the peak<sup>19</sup> in terms of monthly volume every year – it did not reach 8 per cent of total liquidity, compared to 16 per cent in the previous year.

**Chart 25**  
Credit transfers by corporate and retail banks  
(2016)



### 1.3.1.2 Liquidity management of VIBER and ICS participants

**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 important for the mitigation of clearing and settlement risk.** The extent to which participants

<sup>16</sup> The three-month deposit is not counted among the instruments eligible as central bank collateral; therefore, it cannot be used as liquidity in VIBER.

<sup>17</sup> 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.

<sup>18</sup> Based on empirical turnover data, a distinction is made between credit institutions depending on whether they have a more retail or more corporate clientele. Retail banks have many customers, and low-value transactions account for a major part of their turnover, although a relatively low number of extremely high values may also occur. By contrast, corporate banks have few clients, but they launch many high-value transactions.

<sup>19</sup> 17 million transactions were cleared in the system in December 2016.

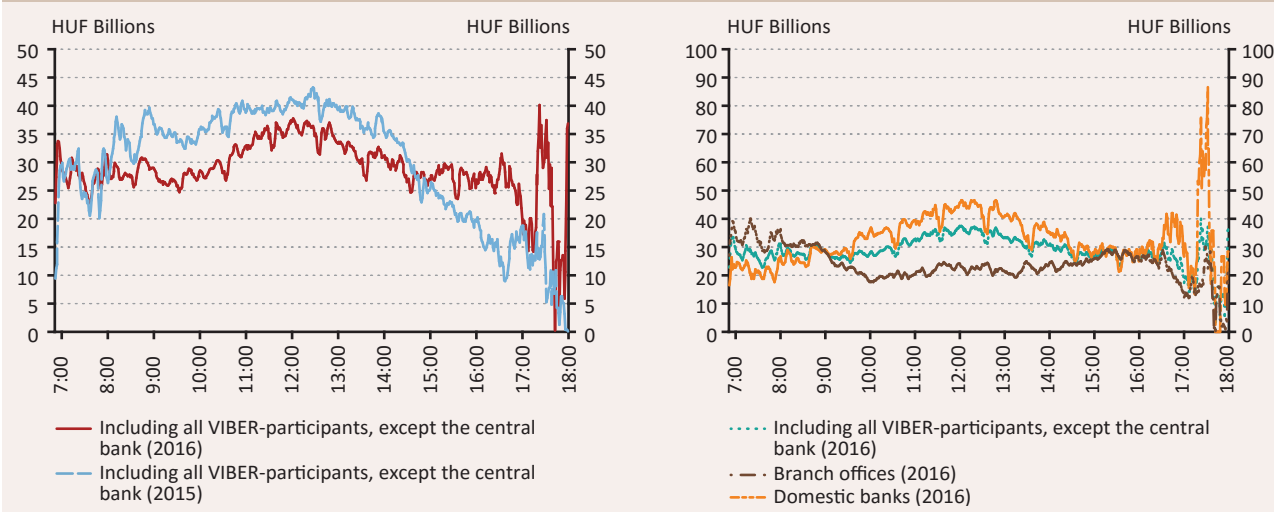
rely on their account balance and credit line in the execution of payment transactions, and when they send their transactions in the system during the day depends on their respective liquidity management strategy and balance sheet total, the stock of securities on their balance sheets available as eligible collateral and the level of the required reserve ratio.

**As a result of the increase in liquidity at the annual level, the maximum utilisation of intraday credit lines (MICL)<sup>20</sup> declined considerably in annual terms at the level of the banking sector as a whole. Overall, system participants utilised their credit lines more actively and for longer durations than in the previous year, but clearing and settlement risk did not increase because of that.** The MICL is still considered low (4–16 per cent) at the system level; in fact, it even declined slightly (by 2 percentage points) compared to the previous year. On an individual bank basis, the MICL figures still vary considerably; 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 45–65 per cent on average annually, more than half of the participants do not or only seldom use their respective credit lines. In 2016, the average value of the utilisation of intraday credit lines was up by 4 per cent, i.e. some HUF 12 billion, compared to the previous year. In addition to the 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 utilisation during the day. In 2016, the credit line was used for a 30-minute longer period on average by participants to ensure their liquidity. Accordingly, participants used the credit line for a total 2.5 hours on average every day. As a result of the 1-percentage point reduction of the required reserve ratio, the payment account balance of nearly one-third of the VIBER participants declined. As a result, credit line usage also increased by 1 hour on average. The intraday credit line is used by VIBER participants until 17:00 hours continuously, with a similar value (between HUF 20–40 billion), and then the credit line utilisation increases significantly, until the closing of VIBER (between HUF 40–70 billion) (Chart 26, right side). In the first hour following the opening of VIBER, branch offices<sup>21</sup> tend to use their credit lines more actively; after this period, utilisation by domestic banks<sup>22</sup> is more prominent until about 15:00 hours. Compared to the previous year, credit line utilisation is more active in both groups as of 15:00 hours, and the value increases until the end of the day. Prior to the closure of client operating hours, activity increases in the case of domestic banks starting from 16:00 hours, and the value rises significantly in both groups after 17:00 hours. At this point, in addition to setting the end-of-day closing positions, participants also need to provide liquidity for the execution of the last cycle of the intraday clearing. While domestic banks are more active in credit line utilisation, the

**Chart 26**

**Extent of using the intraday credit line in VIBER on one day, for all participants (left-hand chart) (2015–2016) and broken down by domestic banks and branch offices (right-hand chart) (2016)**



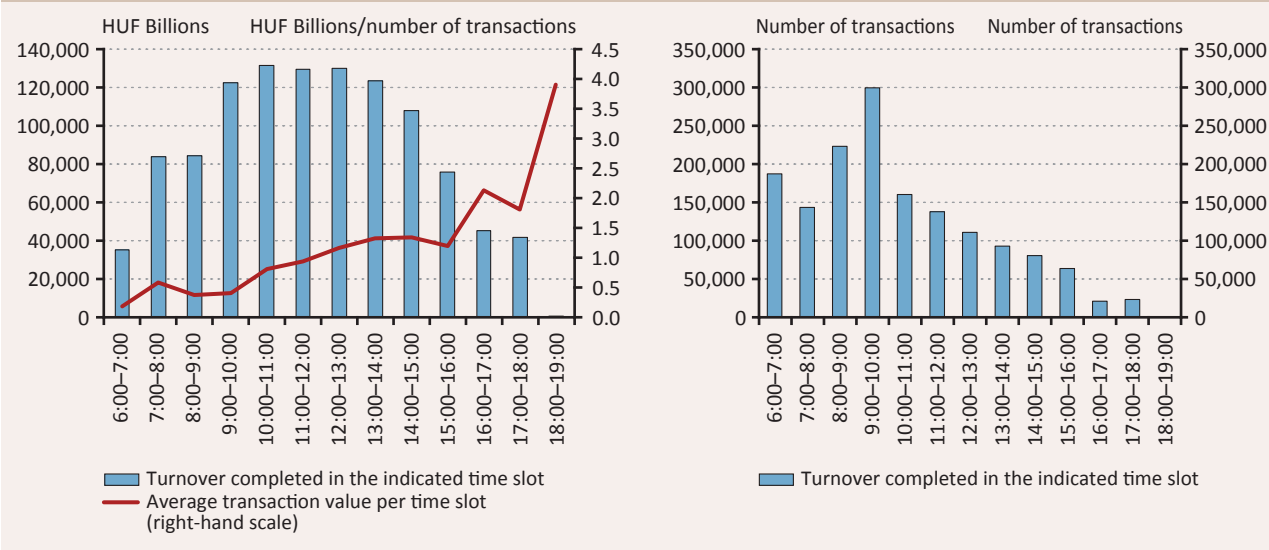
<sup>20</sup> Credit line utilisation shows the portion of the total available intraday credit line a bank has used on a given business day. The lowest intraday current account balance is compared to the available credit line and as such, it is considered to be a snapshot.

<sup>21</sup> This category includes VIBER participant branch offices inside and outside of the EU.

<sup>22</sup> Domestic banks are VIBER participant banks and specialised credit institutions.

**Chart 27**  
**Intraday developments in the value and average transaction size (left-hand chart) as well as the number of transactions (right-hand chart) of the VIBER turnover broken down by hour**

(2016)



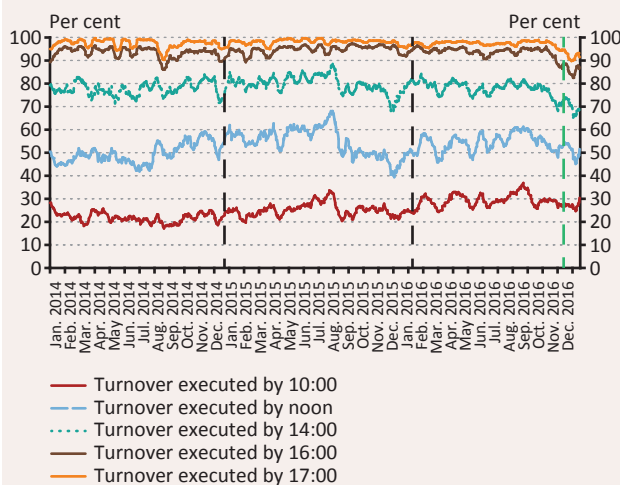
intraday credit line utilisation of branch offices is more even (Chart 26, left side).

**In 2016, the intraday distribution of the number and value of VIBER transactions varied; the timing of transactions followed the changes that have an impact on participants' liquidity.** Intraday developments in the value of VIBER turnover follow a normal distribution; some 70 per cent of the turnover takes place between 9:00 and 15:00 hours. By contrast, the number of transactions performed is concentrated in the morning hours; nearly 70 per cent of the daily number of transactions are already carried out by 11:00 hours (left-skewed distribution is typical). VIBER participants typically leave the settlement of their low-number but individually higher-value transactions for the early afternoon (Chart 27). The changes that have an effect on participants' liquidity (for example modification of the MNB's instruments) influence their transaction timing behaviour. In the process of adjusting to the changes, banks usually apply more cautious launching of payments, as a result of which their daily payment turnover may take place later. In 2016, a similar phenomenon was observed as of end-September; transactions were sent some 10–12 percentage points later. This phenomenon may have been attributable to the reduction of the frequency of the three-month deposit in August and to the limitation on its holdings, resulting in a withdrawal of liquidity from the system by participants. As a result,

banks presumably applied more cautious liquidity management; upon launching their transactions, they probably waited for the liquidity that was to be received by them. Sending of payments gradually returned to the previous practice as of December, but did not quite reach the pre-September level by the end of the year (Chart 28).

**Chart 28**  
**Timing of turnover in VIBER (what portion of total daily turnover is completed until a specific point in time)**

(2014–2016)



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

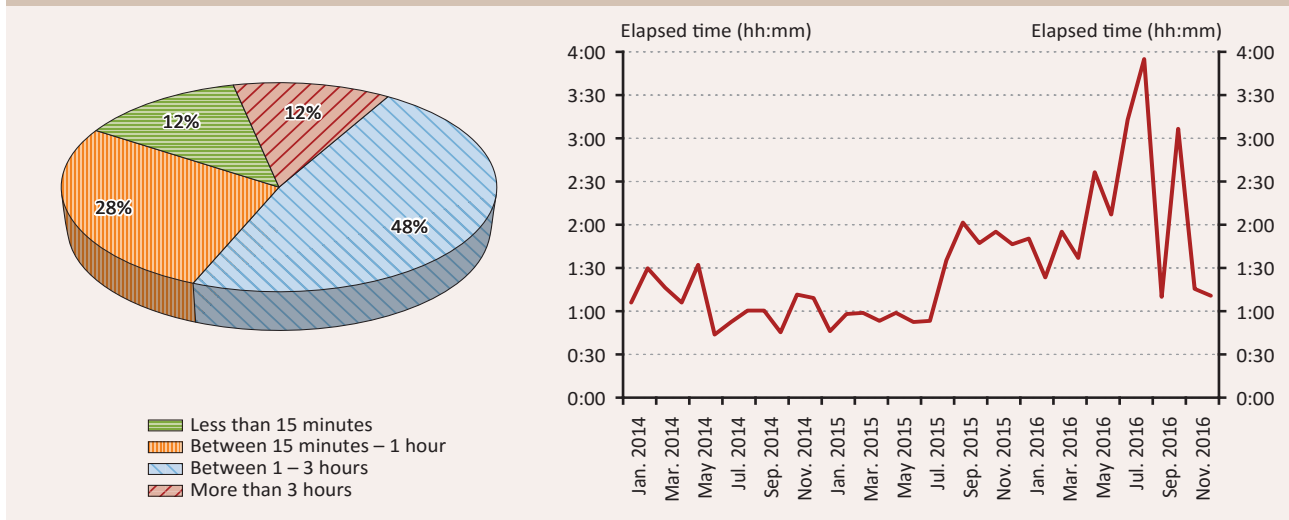
### 1.3.1.3 Queuing in VIBER and the roll-over of transactions between intraday clearing cycles in the ICS

In 2016, there was less queuing in VIBER both in terms of value and the number of cases, although the average time spent in the queue increased by half an hour, with an overall increase in clearing and settlement risk. Transactions initiated by a bank will be placed in a queue until sufficient funds become available for execution (e.g. as a result of the financing effect of received, credited transactions or credit line increases or queue rearrangement). The fact of queuing in itself does not necessarily mean that a participant has a liquidity problem, as the existence of the queue is a natural part of the operation of real-time gross settlement systems. Based on an examination of queues, it can be decided whether there is an actual liquidity problem behind or the queuing is attributable to individual banks' liquidity management practice. As a result of expanding liquidity and the more efficient treasury practices of some high-turnover participants, compared to 2015, the number and value of VIBER transactions in a queue declined by 81 and 40 per cent, respectively. Nevertheless, queuing occurred in 95 per cent of the working days, and the time spent in the queue increased by 5 percentage points. Transactions queued up for 1 hour and 50 minutes on average, i.e. 27 minutes longer than in 2015, but much longer queuing times – 4–6 hours on average – also occurred (Chart 29). Within the day, queuing typically starts in

the first two hours after the opening of VIBER, and transactions leave the queue by noon at the latest. Partly reflecting the various liquidity management practices,<sup>23</sup> there are significant differences among VIBER participants in terms of the duration of queues. 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 – 40–120 minutes per day on average – in the queue. Participants whose liquidity management is less active and often perform their transactions without a credit line queue up for a longer time, for 2.50–6.16 hours on average. The average daily length of queues increased in the case of both groups of participants compared to the previous year. On some settlement days, extremely long queues occurred in 2016 as well, but their duration declined by 2 hours compared to the previous year. Participants deliberately undertook to queue up for more than 4–6 hours. Considering that the VIBER turnover of these participants is low, 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 2016, there were no gridlocks in VIBER.

**Transaction roll-overs frequency in the ICS intraday clearing decreased significantly.** In 2016, 74 per cent less roll-overs took place than a year earlier, which suggests a more efficient bank liquidity management. They concerned a total seven participants in a value

**Chart 29**  
Average daily duration of queues  
(2016)



<sup>23</sup> 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 HUF 82 billion, while in 2015 concerning thirteen participants occurred shortage of liquidity in a total value of HUF 128 billion. Examining the transaction roll-overs we observed that in 2015, right after the cycle increase the number of roll-overs rose significantly.<sup>24</sup> We presumed that its underlying reason was that the participants concerned had not yet adjusted themselves adequately to the hourly provision of liquidity resulting from the cycle increase. However, in the case of some of these participants transaction roll-overs occurred in 2016 as well, which suggests that the transaction roll-overs are not attributable to an adjustment problem. In relation to ICS participants' practice of sending payments, an important aspect is the compliance with the so-called 4-hour rule.<sup>25</sup> Following the cycle increase, roll-overs across two cycles do not yet result in a violation of the rule, and thus participants are not sufficiently motivated to provide the necessary liquidity for each cycle. In the case of roll-overs across three cycles, the 4-hour rule is likely violated. Because of this, in 2016 there were no transaction roll-overs across three cycles, and at the same time the number of roll-overs across one or two cycles decreased as well (Chart 30). During our oversight inspection we established that a significant portion of the roll-overs could have been avoided, as the banks concerned had enough securities to pledge

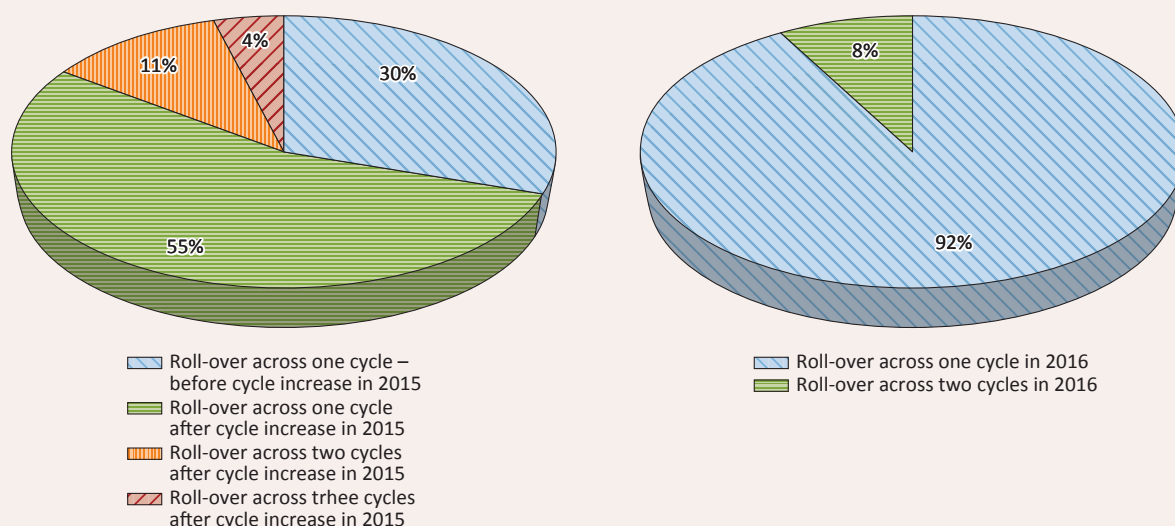
for providing the necessary liquidity. Therefore, in their case we can presume liquidity management faults or deliberately undertaken practices.

### 1.3.2 CLEARING AND SETTLEMENT RISK IN KELER

In KELER CSD, the number and value of DvP transactions, that represent a low settlement risk, continue to be significant. However, compared to the previous year, the ratio of FoP transactions rose in 2016, slightly increasing settlement risk. During the settlement cycle of securities transactions, settlement risk is present. This risk comes from the uncertainty that one of the transaction participants does not receive the security or its countervalue. There are three ways to reduce this risk: (1) by encouraging settlement in central bank money, (2) by settlement based on the principle of delivery versus payment (DvP<sup>26</sup>) provided by the central securities depository and if the securities transactions are made (3) by the contracting parties with the involvement of a central counterparty, and thus the settlement is guaranteed by the central counterparty.<sup>27</sup> KELER CSD's settlement risk can be assessed on the basis of the ratio of DvP type transactions within the turnover and on the basis of the extent to which the settlement is carried out in central

**Chart 30**  
Ratio of roll-overs to total roll-overs before and after the cycle increase

2015 (left-hand chart) – 2016 (right-hand chart)



<sup>24</sup> The ratio of roll-overs affecting one cycle rose from 25 per cent to 60 per cent, the ratio of those affecting two cycles increased from zero to 11 per cent, and roll-overs across three cycles were also observed.

<sup>25</sup> See: Glossary.

<sup>26</sup> Delivery versus Payment (see: Glossary).

<sup>27</sup> See the part on the clearing and settlement risk of KELER CCP.

bank money in the case of these transactions. In 2016, DvP type – over-the-counter<sup>28</sup> – securities transactions accounted for nearly 65 per cent of turnover, and 96.6 per cent of the securities turnover was performed by partners that had a money account with the MNB, i.e. the cash leg of transactions was settled in central bank money. It is a Hungarian specialty that KELER CSD has a specialised credit institution license, and thus its customers hold their payment accounts in KELER CSD. In another way, the settlement in commercial bank money is coupled with much lower settlement risk compared to the scenario where KELER CSD would use the settlement bank services of another commercial bank.

The remaining 35 per cent of securities transactions are performed as FoP<sup>29</sup> transactions, where the cash and security legs of the transaction are settled separately, i.e. technically KELER CSD receives only securities debiting and/or crediting instructions. This entails a settlement risk because it is unknown when and how the cash side of the securities transaction will be settled. Compared to 2015, FoP type turnover increased both in terms of value and its ratio, although it is still below the 2014 level.<sup>30</sup> Compared to the 2016, the total value of FoP transactions<sup>31</sup> and the number of transactions increased by 2.81 per cent and 9.81 per cent, respectively.

## Box 2

### Appearance of CSDR RTS and the re-authorisation of KELER CSD

The European Parliament and the Council adopted the Regulation on improving securities settlement and on central securities depositories (CSDR) in 2014, related to which the regulations on regulatory technical standards (RTS) and implementing technical standards (ITS) were also elaborated in 2015. Following minor amendments, the second-level legislation was finalised in 2016, and thus, following their adoption, three RTS and two ITS were published in the Official Journal of the European Union on 10 March 2017 (Table 3). It should be noted, however, that the European Commission still has not adopted the RTS on settlement discipline.

Table 3

#### Regulations on regulatory technical standards and implementing technical standards published on 10 March 2017

Regulatory technical standards (RTS)	Implementing technical standards (ITS)
<ul style="list-style-type: none"> <li>• Commission Delegated Regulation (EU) 2017/390 of 11 November 2016 supplementing Regulation (EU) No 909/2014 of the European Parliament and of the Council with regard to regulatory technical standards <i>on certain prudential requirements for central securities depositories and designated credit institutions</i> offering banking-type ancillary services</li> <li>• Commission Delegated Regulation (EU) 2017/391 of 11 November 2016 supplementing Regulation (EU) No 909/2014 of the European Parliament and of the Council with regard to regulatory technical standards further specifying the content of the reporting on <i>internalised settlements</i></li> <li>• Commission Delegated Regulation (EU) 2017/392 of 11 November 2016 supplementing Regulation (EU) No 909/2014 of the European Parliament and of the Council with regard to regulatory technical standards on <i>authorisation, supervisory and operational requirements for central securities depositories</i></li> </ul>	<ul style="list-style-type: none"> <li>• Commission Implementing Regulation (EU) 2017/393 of 11 November 2016 laying down implementing technical standards with regard to the <i>templates and procedures for the reporting and transmission of information on internalised settlements</i> in accordance with Regulation (EU) No 909/2014 of the European Parliament and of the Council</li> <li>• Commission Implementing Regulation (EU) 2017/394 of 11 November 2016 laying down implementing technical standards with regard to standard forms, templates and procedures for <i>authorisation, review and evaluation of central securities depositories, for the cooperation between authorities of the home Member State and the host Member State, for the consultation of authorities involved in the authorisation to provide banking-type ancillary services, for access involving central securities depositories</i>, and with regard to the format of the records to be maintained by central securities depositories in accordance with Regulation (EU) No 909/2014 of the European Parliament and of the Council</li> </ul>

The adoption of the RTS and ITS and their publication in the Official Journal of the European Union means that central securities depositories – including KELER CSD – have 6 months to submit to the competent authority the documents necessary for obtaining the licence under the CSDR and to request the competent authority to conduct the authorisation procedure according to the CSDR.

<sup>28</sup> Settlement is not guaranteed by a central counterparty.

<sup>29</sup> Free of Payment (see: Glossary).

<sup>30</sup> 42 per cent

<sup>31</sup> Excluding pledging and securities generation transactions.

### 1.3.3 CLEARING AND SETTLEMENT RISK IN KELER CCP

The turnover of KELER CCP cleared markets increased in 2016. Parallel to this increase, a slight improvement can be experienced as for clearing and settlement risk. The central counterparty guarantees the settlement of the transactions cleared. The increase in overall turnover of the cleared markets indicated an increase in the degree of clearing and settlement risk. The change in clearing and settlement risk occurs at the same direction as the turnover but not to the same extent.<sup>32</sup> 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. Turnover slightly declined in the capital markets where turnover is the highest in terms of value. Compared to the previous year, turnover in the spot capital markets declined by less than one per cent, while in the derivative markets it was down by 6.5 per cent. In 2016, a significant increase was observed, with regard to the cleared natural gas markets, which is primarily attributable to the upturn in trading in both the spot and forward natural gas markets. Turnover in the CEEGEX spot market increased by nearly 2,000 per cent (there was no turnover in the derivative market in 2015, so no comparison is possible). Considering that in spite of the significant growth in gas market turnover, it accounts for less than 16 per cent of KELER

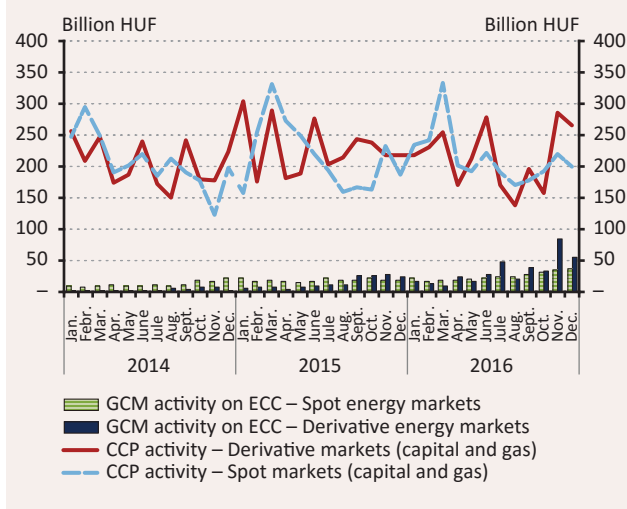
CCP's turnover value, clearing and settlement risk increased only slightly overall in 2016 (Chart 31).

Similarly to the previous year's expansion, the turnover of the non-clearing member service provided as a general clearing member grew dynamically in 2016 as well. As an energy market clearing member of the German European Commodity Clearing (ECC), KELER CCP provides non-clearing member services. Compared to the previous year, turnover in the spot and derivative markets expanded by 33.47 per cent and 125.77 per cent, respectively. In spite of the fact that the range of markets accessible through the ECC expanded further in 2016 with the APX<sup>33</sup> and BELPEX<sup>34</sup> markets, the increase in turnover was attributable to the increase in turnover generated by the markets that had been accessible before as well, and not to the non-clearing member activity in the new markets. In connection with the service provided as a general clearing member, the clearing and settlement risk is not unlimited, since ECC is an EMIR-licensed CCP which primarily takes the risk. Naturally, the dynamically growing turnover means higher risk as well for KELER CCP, but its degree in 2016 remained below the turnover and risk represented by the markets cleared as a central counterparty (Chart 31).

The energy market is catching up with the capital market not only in terms of the number of customers and the increasing number of transactions, but also through the open positions, which resulted in mounting clearing and settlement risk as well. In 2016, the increased turnover in derivative markets via the non-clearing member service was coupled with an expansion in open positions. While between 2014 and end-2015 the value of the energy market open positions was around 10 per cent of the capital market open positions, by the end of 2016 this ratio exceeded 50 per cent. The open position coming from non-clearing member service is nearly seven times higher than the average of the previous years. It is important to emphasise that the risk of the open positions is at ECC central counterparty in the first stage. This, of course, does not mean that KELER CCP does not bear its non-clearing member's risk.

In 2016, the risk management framework of KELER CCP efficiently managed and averted any spillover of defaults – which rose both in number and value during the year – to other market

**Chart 31**  
Turnover of the markets cleared by KELER CCP and of the energy market non-clearing member service  
(2014–2016)



<sup>32</sup> As a result of the netting effect, the actual obligation to settle is between 20–40 per cent of the contract stock to be settled.

<sup>33</sup> Amsterdam Power Exchange.

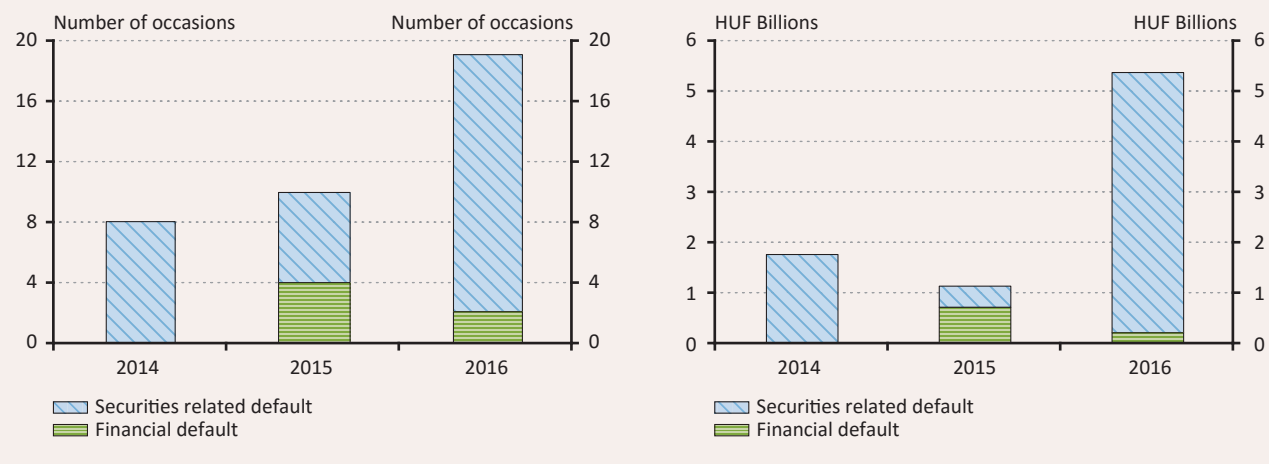
<sup>34</sup> Belgian Power Exchange.

**participants, without the need to use emergency measures.** The objective of the central clearing and guarantee undertaking operated by KELER CCP is that the transactions received from the trading venues concerned should – through the elimination of counterparty risks – be settled in full and that compared to the gross settlement principle their settlement should cause as little liquidity strains as possible for the participants. If a clearing member has insufficient funds or securities to settle a transaction when it becomes due or the margin requirements entailed by the KELER CCP system membership are not available, the central counterparty’s default management procedure is activated. In this procedure, the central counterparty makes arrangements to suspend the trading license of the non-performing participant, and begins collecting the available collateral. In 2016, KELER CCP provided clearing and

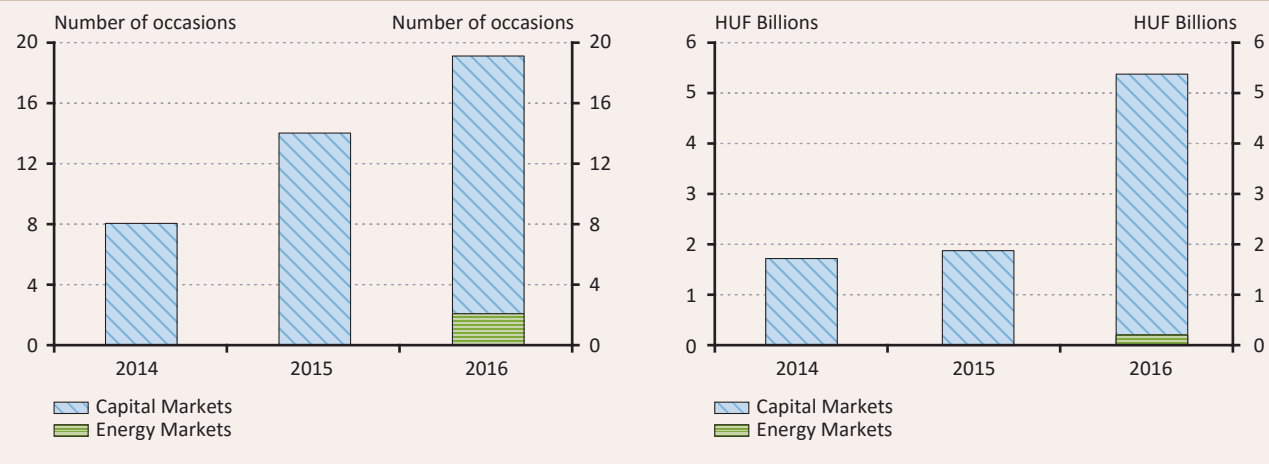
guarantee undertaking services in the capital and energy markets altogether at 14 locations for more than 120 participants. During that, non-performance occurred on twenty-one occasions, in a value of more than HUF 5.6 billion, relating to 9 participants and concerning 5 trading venues (Chart 32). As a result of the prudent risk management methodology applied by KELER CCP, it was possible to address non-performances without major impacts on the market; they did not have a feed-through effect on other participants, and the central counterparty did not suffer any loss.

**The bulk of non-performances was related to securities in 2016 as well. At the same time, the number and value of non-performances in the energy market increased significantly compared to the previous years.** In line with the previous years,

**Chart 32**  
Non-performances in the markets cleared by KELER CCP  
(2014–2016)



**Chart 33**  
Trading venues affected by non-performances  
(2014–2016)

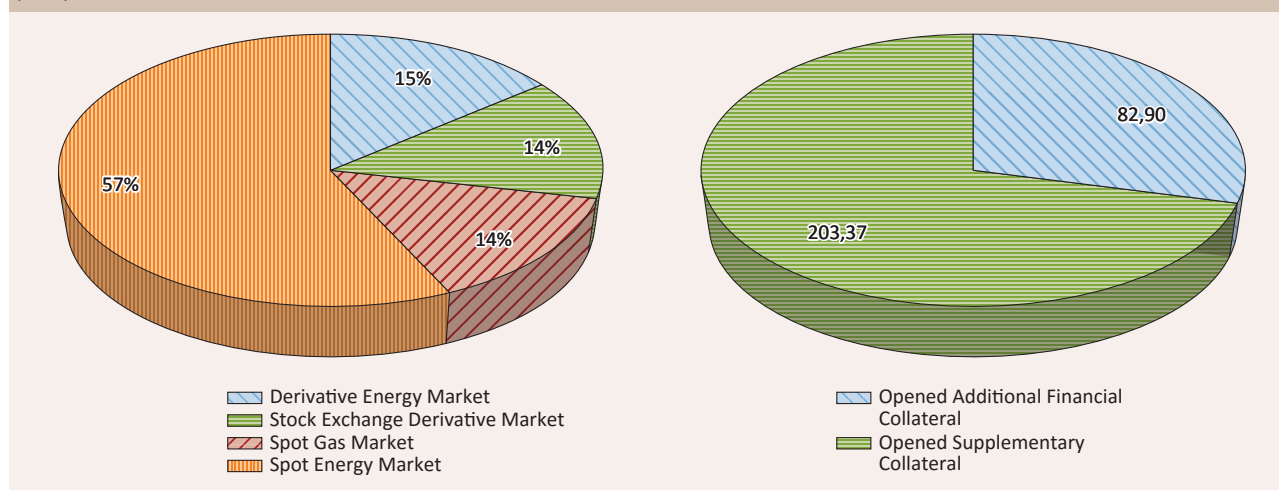


the majority of non-performances mainly affected the capital market; 96 per cent of the value of all incidents was related to the failure to make securities available on time, which is primarily attributable to the non-performances observed in the secondary market of government securities in 2016 Q3. Nevertheless, the growth in turnover experienced in the energy markets cleared by KELER CCP is increasingly important in terms of risk management as well. In 2016, in this area, cash leg non-performance related to participants' liquidity difficulties occurred on two occasions in a total value of more than HUF 220 million, which was the highest value since 2012, amounting to 70 per cent of all energy market non-performances (Chart 33).

**In 2016, imposing additional financial collateral was necessary mainly in the case of energy market customers, which ensured the neutralisation of risks that were gradually increasing in the case of the trading venues concerned.** In the case of the transactions it guarantees, KELER CCP can impose additional financial collateral and/or supplementary margin if it is required by the risks related to members' trading practice, participants' inadequate liquidity or capital position, or insufficient contribution to guarantee funds. They are withdrawn when the risk that served as a basis for the imposition or the participant's legal relationship with the central counterparty ceases to exist. In 2016, additional

financial collateral was called for on six occasions in the energy market and once in the capital market (Chart 34, left side), which represents a decline compared to 2015.<sup>35</sup> In 2016, the reason for imposing the additional financial collateral in the energy market in five cases was the failure to report data and in one case a non-performance in the futures energy market, while in the capital market it was the violation of the individual capital position limit on one occasion.<sup>36</sup> In 2016, as the reasons for imposition ceased to exist, two additional financial collaterals and one supplementary margin were withdrawn. Of the withdrawn items, the additional financial collaterals were imposed during 2016 on a capital market participant and on an energy market participant, whereas the supplementary margin was imposed by KELER CCP in 2015 because of an energy market customer's insufficient equity. The decline in the size of positions in the case of the capital market participant and making up for the non-performance and an improvement in the capital position in the case of the energy market participants terminated the risks that served as reasons for the imposition. Although no supplementary margin was imposed in 2016, the total value of the supplementary margins and additional financial collaterals imposed with the aim of risk management in the previous year and not withdrawn yet exceeded HUF 280 million on 31 December 2016 (Chart 34, right side).

**Chart 34**  
Distribution of the number of cases of additional financial collaterals imposed (left-hand chart) and the value of additional financial collaterals and supplementary margins opened on 31 December 2016 (HUF million) (right-hand chart)  
(2016)



<sup>35</sup> In 2015, additional financial collateral was imposed on 9 occasions, 8 of which were related to the capital markets and 1 to the spot energy market.

<sup>36</sup> In the case of the violation of the individual capital position limit, the sum of the collateral elements calculated on the basis of the participant's positions compared to the equity exceeded the value determined in the business rules of KELER CCP.

### 1.3.4 FORINT TURNOVER SETTLED IN CLS

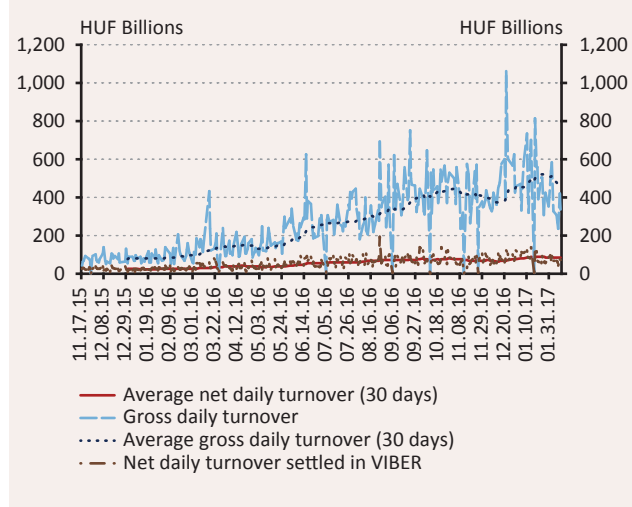
It is a significant contribution to the stability of the banking sector that in 2016 there was a more than six-fold increase in the value of FX transactions against the forint settled through the CLS system without FX settlement risk. On 16 November 2015, the Hungarian forint was the first currency to be introduced from the Central European region into the international FX settlement system called Continuous Linked Settlement (CLS). As a result of the accession project led by the MNB, a state-of-the-art service became available for Hungarian FX market participants that allows the elimination of the settlement risk that arises in the case of FX transactions, i.e. the improvement of the stability of the domestic financial system. In line with the MNB's expectations, following the launch of the service the forint turnover settled in the system started to rise sharply. As a result, the average turnover of HUF 80 billion of the first days increased to HUF 490 billion by early 2017. In parallel with that, the net amount of money needed for the transactions grew from HUF 25 billion to HUF 75 billion only, which means that the netting effect of the system improved from 68 per cent to 83 per cent (Chart 35). As a result of the netting function of CLS, the same amount of interbank forint liquidity allowed the settlement of more FX transactions, i.e. the

efficiency of conducting FX transactions improved. The developments were favourable in the year following the launch of the service. Nevertheless, at end-2016 nearly two-thirds of the forint market, which is estimated to have a daily total value of USD 5 billion,<sup>37</sup> was settled outside CLS. In parallel with a migration of this turnover, the risk assessment of the forint and the efficiency of the FX market may continue to improve.

**After the forint joined CLS, in spite of the increased turnover, payments to CLS did not cause any liquidity problems for the nostro account managing VIBER participants, and thus the related clearing and settlement risk continues to be low in VIBER.** The direct members of CLS – since they have not joined VIBER in 2016 – arranged the collateral for the CLS settlement related to their forint FX transactions through 4 VIBER participants as their nostro account managers. Due to the operational specifics of CLS, clearing of payments to and from the system takes place in the morning hours, i.e. payments to the VIBER account of CLS must be completed in 2 periods determined by CLS: between 7:00–8:00 and 8:00–9:00 hours. Simultaneously with the six-fold increase in the gross daily turnover, the value of net payments into CLS increased steadily in 2016, and by the end of the year this growth was nearly four-fold. The daily average turnover of the payments to CLS in the period reached HUF 55 billion,<sup>38</sup> accounting for 0.5–3.5 per cent of the total VIBER turnover settled on the given day (Chart 36). In 2016, in spite of the growing turnover, nostro agents made their CLS-related payments mostly relying solely onto their account balances. Credit lines were rarely used and only to a negligible degree (the average credit line utilisation of VIBER participants acting as nostro agents in the period of paying to CLS was around 0.5–2 per cent).

**During the first year of CLS membership of the forint, the number of international institutions using the service more than doubled.** A significant portion of the forint turnover settled in CLS is between international institutions, as transactions concluded in such relations dominate in the global market turnover of the forint. Accordingly, when large international institutions direct their forint transactions into the framework provided by CLS, the efficiency of forint settlement increases sharply, as was seen in 2016. Further growth in the total value of forint transactions settled in CLS may be achieved by

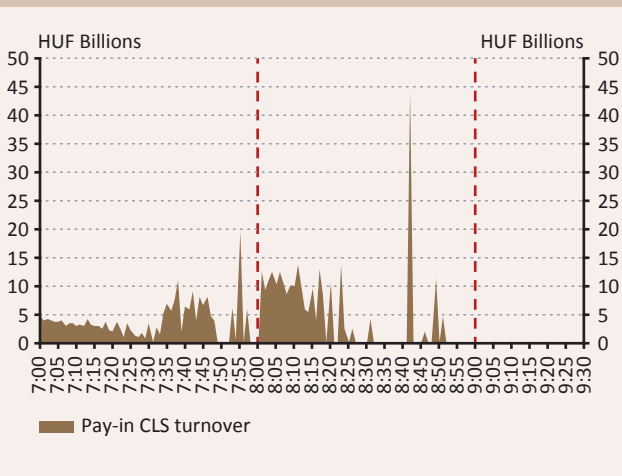
**Chart 35**  
Daily gross forint turnover settled in the CLS system and the related net forint turnover settled in VIBER  
(17 November 2015 – 10 February 2017)



<sup>37</sup> Based on: 'Bank of International Settlements: Triennial Central Bank Survey of foreign exchange and OTC derivatives market in 2016'.

<sup>38</sup> Taking into account both payments to CLS and payments launched by CLS, the daily average turnover doubles, i.e. expands to some HUF 111 billion. This is 1–7 per cent of the daily average VIBER turnover.

**Chart 36**  
**Daily distribution of the average turnover value of payments to CLS**  
 (2016)



the involvement of international institutions that have not been involved to date. This will open further risk-mitigating and business possibilities for domestic market participants as well. The latter means an expansion in the range of FX market counterparties accessible in CLS and an increase in the number of customers that are looking for account management services in the local market. The MNB focuses on the objective that as many domestic institutions should be able to manage their respective FX settlement risks by means of CLS as possible, and the appearance of new international players may also facilitate this. With the increase in the number of direct CLS members that use the service for forint settlement, more and more institutions which are able to provide third party services for domestic institutions may appear. Therefore, it is important that encouraging the use of CLS remains a central bank priority.

## 1.4 Findings of payment inspections

According to the on-site inspections conducted in 2016, similarly to the previous year, compliance was generally observed in the payment transactions performed by the credit institutions inspected, but violations that affected a broad range of customers also occurred from time to time. 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. In 2016, the MNB conducted the scheduled inspection of compliance with the provisions of the Act on

the Provision of Payment Services, the Decree on the Execution of Payment Transactions and the Interchange Fee Regulation at 15 credit institutions. In addition to two credit institutions with high payment turnover, the MNB conducted scheduled inspections at 13 cooperative credit institutions; violations of statutory provisions were found in 112 cases (Chart 37). Each inspection was concluded with a call for measures, and in consideration of the severity of the violations identified, the MNB imposed fines on two credit institutions amounting to HUF 4.2 million in total (Table 4). This amount was augmented by an additional amount of HUF 51.5 million in fines imposed in the context of three inspections carried

**Table 4**  
Main data of the inspections conducted by the MNB broken down by type of institution  
(2014–2016)

Main data of the inspections	Type of institution	2014	2015	2016
Number of institutions inspected	Bank	9	7	2
	Cooperative credit institution	13	15	13
	Other payment service provider	1	-	-
	Voucher issuer	-	-	4
	<b>Total:</b>	<b>23</b>	<b>22</b>	<b>19</b>
Number of findings	Bank	44	69	18
	Cooperative credit institution	93	115	88
	Other payment service provider	1	-	-
	Voucher issuer	-	-	6
	<b>Total:</b>	<b>137</b>	<b>184</b>	<b>112</b>
Number of tasks required within the framework of measures	Bank	46	43	10
	Cooperative credit institution	68	78	49
	Other payment service provider	1	-	-
	Voucher issuer	-	-	2
	<b>Total:</b>	<b>115</b>	<b>121</b>	<b>61</b>
Number of fines	Bank	3	5	-
	Cooperative credit institution	8	6	2
	<b>Total:</b>	<b>11</b>	<b>11</b>	<b>2</b>
Amount of fines – HUF million	Bank	37	77.5	-
	Cooperative credit institution	29.7	19.2	4.2
	<b>Total:</b>	<b>66.7</b>	<b>96.7</b>	<b>4.2</b>

Note: The tasks required and the fines imposed within the framework of the measure were summarised and added up for the year of launching the inspection, regardless of the actual date of making the relevant decision.

over from 2015 and by fines amounting to HUF 6.4 million levied on three credit institutions in relation to inadequate implementation of the measures prescribed in the context of inspections performed in 2015. As a result, the fines imposed in 2016 amounted to a total HUF 61.1 million.

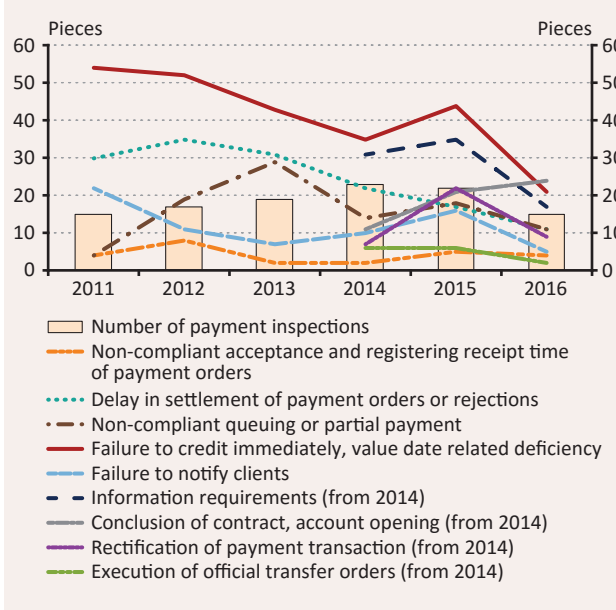
**In connection with the Act on the Provision of Payment Services, the most frequent infringements were related to the provision of information prior to concluding contracts, the form and content requirements of contracts as well as the opening of accounts.** Pursuant to the requirements of the Act on the Provision of Payment Services, the contracts to be concluded with customers as well as the information provided prior to signing the contract should contain – *inter alia* – the rules concerning the essential features of the service, the liability rules as well as those regarding the amendment and termination of the framework contract, for the content of which the Act on the Provision of Payment Services itself also contains provisions that protect the interests of customers. The inspections revealed that credit institutions deviated from the provisions of the Act on the Provision of Payment Services on several occasions, and in many cases they included conditions in their contract terms that were unfavourable for the customers. Another frequent error was that the opening of payment accounts did not take place using the documents required by the relevant legislation.

**In connection with conducting payment transactions, the regulation on making the amount of the payment transactions to be credited to the beneficiary immediately available was most frequently violated.** The amount of payment transactions is still not always made immediately available for the beneficiary in the case of postal cash transfers, FX transfers and crediting initiated with payment cards. The violation of this provision continues to be strictly judged by the MNB as the regulation has been in effect for a long time, and today's technical development level allows much faster processing than almost ten years ago, when the legislation was adopted.

**In order to increase the number of payments to be effected using payment cards, adequate information should be provided to acquirers both in connection with concluding the contract and subsequently, during the settlement of the payment transactions and the related fees, thus contributing to acquirers' adequate knowledge.** Since 2016, the

MNB's inspection activity has covered compliance with a new statutory instrument, the Interchange Fee Regulation, a part of which – preceding the EU law-making – was included in the Act on the Provision of Payment Services, domestic market participants had to prepare only for the provisions not regulated before. The Interchange Fee Regulation determines the maximum possible extent of the interchange fee per transaction for debit and credit card transactions, regulates certain content elements of the agreements between the payment service provider as acquirer and the beneficiaries, determines the requirements concerning the information to be provided to beneficiaries, which together enable the beneficiaries to make more efficient decisions in order to rationalise their own costs. Compliance with the Interchange Fee Regulation was inspected at cooperative credit institutions and the two inspected banks. It was found that the most frequent deficiencies occurred in providing – adequately detailed – preliminary and subsequent information to acquirers. During the preliminary provision of information and the concluding of the contract the fees to be charged on the various categories and brands of payment cards were not detailed as required by the regulation, and during the subsequent information, in connection with the amount of the fees charged for card-based payment transactions, the amounts of the merchant service charge and the interchange fee were not indicated separately.

**Chart 37**  
Non-compliance cases in payments  
(2011–2016)



**In 2016, the 4 voucher issuers operating in Hungary were inspected pursuant to the Act on Payment Service Providers, and no major irregularities were found.** Concerning the operation of voucher issuers, the Decree on payment account switching prescribes capital and recording requirements as well as ones related to the handling of funds received. In addition, it determines the form and content elements of the negotiable voucher, the rules of its redemption, the minimum requirements vis-à-vis the voucher issuer's general business conditions and the tasks related to complaint management. During the inspections, no deficiency was found in the case of one institution. In two cases it was established that the rules concerning cash handling were violated, and in three cases non-compliance with the – statutory – reporting and data provision obligation vis-à-vis the MNB was found.

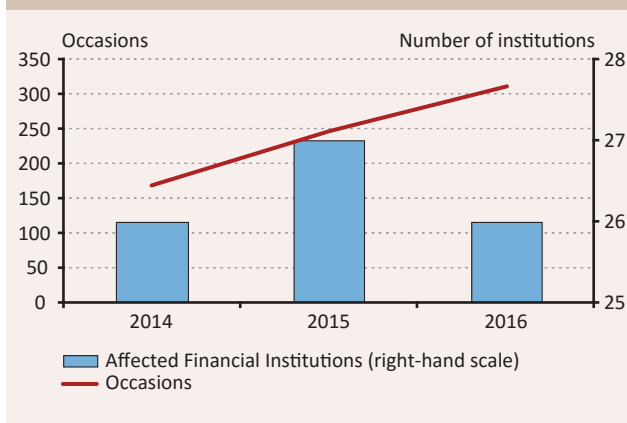
**Starting from 2017, the MNB's inspection activity is expanding further with checks of compliance with certain provisions of the Decree on access to payment accounts and the Decree on payment account**

**switching.** The Decree on access to payment accounts (basic account) and the Decree on payment account switching were announced in 2016 H2. As a result, verification of compliance with these decrees – as provisions concerning the activities of organisations under the scope of the Act on Credit Institutions and Financial Enterprises and the Act on the Provision of Payment Services – became included in the MNB's competence as a new task. Compliance with the provisions of the Decree on basic payment accounts ensures that with the basic account, customers have access to a payment account costs of which are predictable. Compliance with the provisions of the Decree on payment account switching, in turn, ensures standardised, predictable execution and implementation of the processes for customers switching payment accounts and payment service providers, taking account of customers' interests, facilitating the acceleration and simplification of the process of payment service provider switching, which used to be slow and cumbersome, and thus also contributes to increasing competition in the field of payment services.

## 1.5 Payment malfunctions at payment service providers in 2016

Compared to the previous year, in 2016 there were more payment malfunctions in the banking sector. At the same time, compared to the number of payment service providers and the complexity of the financial infrastructure, the number of cases is still low. The number of incidents reported by credit institutions has increased steadily in past years (Chart 38). In 2016, the MNB received information on 311 incidents at 26 credit institutions in total. During the year, the average duration measured from the occurrence of the incidents until their resolution was 9 hours and 40 minutes, which is a significant increase compared to the 3 hours and 40 minutes recorded in 2015. This rise is mainly attributable to one bank's extremely long down-time related to Internet banking. The average duration between the occurrence and noticing of incidents was 3 hours 46 minutes on average.

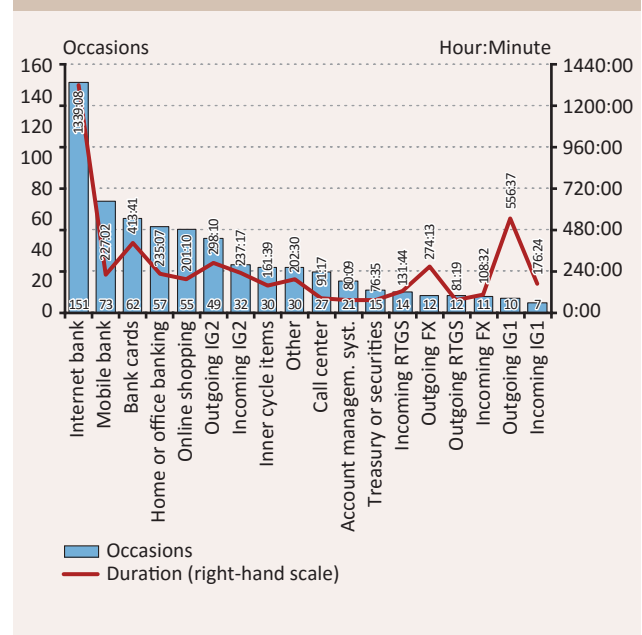
**Chart 38**  
Number of incidents at payment service providers and the number of credit institutions affected by such (2014–2016)



In 2016, the majority of incidents related to payments affected Internet banking systems, although the number of incidents related to mobile banking and payment cards was also significant. Although a single incident may affect various services and activities of credit institutions simultaneously, in 2016 nearly 50 per cent of the events had an

impact on the accessibility of banking services through the Internet or mobile devices (Chart 39).<sup>39</sup> These malfunctions limited customers – *inter alia* – in the launching of credit transfers, in account history query as well as in using other mobile banking services. In 2016, 60 per cent of the total duration of incidents concerning Internet banking was related to an incident at a credit institution in October 2016, during which, due to a withdrawn certificate, for nearly 800 hours some customers only had access to the service through a bypass solution. Nevertheless, the incidents affecting online services were mostly attributable to hardware and software defects directly related to the IT applications that ensure the service, and it was a recurring problem in the case of several banks. Of the incidents, trouble related to the handling of the memory that ensures the operation, inadequate configuration of interfaces and difficulties during the identification

**Chart 39**  
Number and duration of payment service providers' malfunctions by broken down by activity (2016)



<sup>39</sup> In 2016, 151 incidents were related to Internet banking, 73 incidents to mobile banking and 57 to home or office banking services.

of customers need to be mentioned. However, as far as the problems related to identification are concerned, on several occasions the malfunction arose at telecommunications service providers that ensure SMS identification and are independent of the credit institution. The high ratio of malfunctions

related to payment cards and ATMs was notable in 2016 as well, and it increased further compared to previous years.<sup>40</sup> These types of malfunctions were mainly attributable to the multiplayer model<sup>41</sup> of the processes, where the complex structure adds to the possibility of malfunctions.

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<sup>40</sup> The incidents concerned bank cards or ATMs in 7 per cent of the cases in 2014, 11 per cent in 2015 and 19 per cent in 2016.

<sup>41</sup> Card companies, merchants, credit institutions, telecommunication companies, etc.

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# 2 Introducing an instant payment system

## 2.1 Operating model of the instant payment system

**In order to maintain the competitiveness of the domestic economy and the Hungarian financial sector, an instant payment system had to be set up in Hungary as well.** In past years, instant payment systems were launched or their introduction started in the majority of countries that have developed electronic payment systems. In addition, preparations started to create such systems in many other countries. Two directions of development were observed in the euro area in this respect. In some countries, the clearing houses that currently process the transactions started to establish the instant payment system. In addition, however, the European Central Bank is also making preparations for setting up a system with which it will be possible to settle at least the instant payments in euro between any two banks in the Union in real time. Based on international developments, a payment system that is able to process payment transactions in some seconds continuously, on every day of the year, 24 hours a day will presumably be available in many countries already in the first years of the next decade. In addition to the many advantages that the creation of a system like this and the spread of the services based on that may entail for every economic agent, it also improves the competitiveness of the country through the modernisation of the basic financial infrastructure.

**On 13 December 2016, the MNB's Financial Stability Board adopted the set of rules of the instant payment service,<sup>42</sup> based on which payments below HUF 10 million will have to reach the receiver within 5 seconds starting from 2019 H2, and the amount sent will have to be usable for any payment transaction.** The new payment service will be available every day

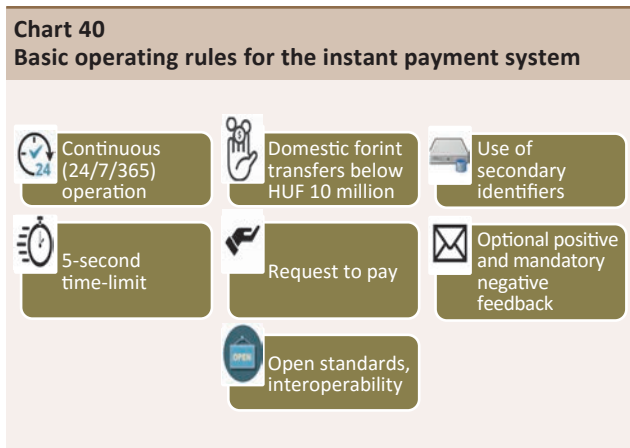
of the year, day and night continuously, so customers will be able to use it at any time. Payment service providers must use this system for domestic transfers below the HUF 10 million value limit initiated from a forint account (Chart 40). As a result, in the case of most present credit transfer transactions, the instant payment service will be the basic service in the future. Service providers will also be able to process transactions that exceed the value limit in the instant payment system if the beneficiary's payment service provider accepts these items as well. Based on operating experiences, the value limit specified for instant payments may also increase in the future. The five-second time-limit must be calculated starting from the receipt of the transaction at the first payment service provider of the paying party. Accordingly, regardless of the number of the service providers participating in the payment chain, the processing time of some seconds has to be uniformly complied with in the case of each payment transaction. Measuring the settlement time ends when the amount and data content of the payment transaction arrive at the beneficiary's account holding payment service provider, based on which the received amount is credited to the beneficiary's account without any delay. It supports the predictability of the settlement of transactions that if the transferred amount does not reach the beneficiary's service provider in maximum 20 seconds from the beginning of the processing of the transaction, the transaction must be refused. In each case, feedback on the result of the payment transaction must be sent to the paying party's service provider, whereas notifications of unsuccessful transactions must also be forwarded to the customer that initiated the transaction. These rules allow

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<sup>42</sup> The rules are described in detail at: <https://www.mnb.hu/en/payments/instantpayments>

a predictable processing of transactions in any case, providing clear results of payment transactions for customers, and thus also allowing the connecting of additional services to the new payment system.

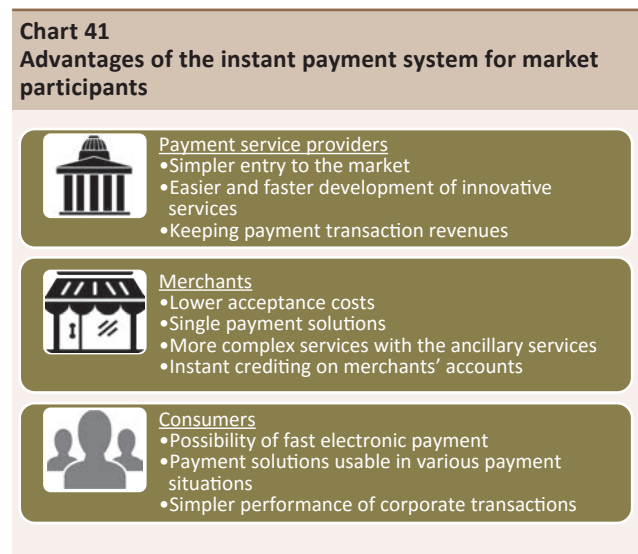
**When determining the operating rules of the system, it was a priority objective to allow the development of services that can be used in the widest possible range based upon the basic infrastructure.** In order to create interoperability between services and for flexible expandability of the service level, the basic services of the central infrastructure and the additional services created by market participants are separated in the instant payment system. Accordingly, the operator of the central system provides only basic solutions that support the processing of basic credit transfer transactions and the creation of additional services, i.e. it does not participate in the development and operation of the services provided to customers. The introduction of the services provided to customers is the task and responsibility of market participants.



**In the instant payment system, it will be possible to initiate payments even by using mobile phone numbers or email addresses as well as to connect further payment related services to the system.** Using secondary identifiers, already starting from the launch of the system it will be possible to initiate transactions even without knowing the account numbers. Secondary account identifiers are identifiers linked to the account numbers, which thus unambiguously identify the beneficiary's account that the sent amount should be credited to. The objective of their use is to prevent the paying party from having to know the beneficiary's long and hard-to-remember account number, enabling him to initiate payments with identifiers used in other areas as well, thus widening the range of possibilities of use. Creation of additional

services is also supported by the possibility of using payment requests. Accordingly, the beneficiary of the transaction may send certain data of the transaction to the payer prior to the payment, based on which it is easier and faster to start the transaction – even without manually entering the payment data. Similarly to instant payments, there will be strict rules for the processing of payment requests in order to ensure the same quality of the availability of the service at each market participant and to provide for interoperability across services. The new function may improve the usability of instant payments both in retail payment situations and in bill payments. The database that stores the secondary identifiers and the forwarding of the payment requests will operate connected to the central infrastructure, and using them, payment service providers and other market participants will be able to provide new payment services to their customers. As a result, even those institutions will be able to provide additional services by using the system that otherwise do not service payment accounts for their customers. Such additional service could be the connecting of the various electronic invoicing solutions or the retail loyalty systems to the instant payment system (Chart 40).

**The introduction of the new payment service brings significant advantages for all economic agents.** Relying on the instant payment system, payment service providers that are already in the market can create innovative payment services more simply and faster, while entering the market will be easier for new market players. Liquidity management will accelerate for corporate clients and merchants, as the countervalue of the goods or services will be received



on their accounts in parallel with the sale, in real time, and will become usable immediately. In addition, the costs related to the acceptance of electronic payments may also decline, and more complex payment solutions can also be used as a result of the additional services. The quick settlement of payments will be advantageous for consumers as well, and it may become possible to use convenient electronic payment solutions in more payment situations (Chart 41). In order to clarify the exact rules concerning the operation of the system and the framework that allows the development of the services for all market participants, a considerable portion of the rules related to the functioning of the infrastructure will appear in legislation as well as in standards.

**In the spring of 2017, GIRO – which is owned by the central bank – started to set up the central infrastructure of instant payment.** In order to coordinate the creation of the system and the services that comply with the new rules, a national project was launched, in which all sectors concerned are represented. By 1 July 2019, GIRO will set up the system that processes instant payments in real time, and will modernise its communication network that forwards the transaction data. The system will operate day and night continuously, without any planned downtime, and its transaction processing capacity will allow the handling of the expected turnover of instant payments at any moment without delay. The settlement of instant payments between payment service providers will be done with the cover of funds separated in advance on a technical account held with the MNB. Upon the clearing of each transaction, the clearing house will update payment service providers' balances it keeps on record, and as a result of the prefunding, the interbank settlement also takes place simultaneously with the clearing. It is important for market participants to take

into account that VIBER will not operate continuously in the future either. Accordingly, for the periods out of the working hours of VIBER, payment service providers have to separate sufficient funds for the settlement of their expected turnover for the instant system in advance, prior to the closing (Chart 42). In addition to payment service providers, other institutions may also connect to the communications network of the central system. The communications network will be able to forward not only the transaction data but also the messages of the additional services related to payments and the payment requests usable for the initiating of payments. In addition, GIRO will operate a secondary identifier database as well, and thus the processing of these identifiers may directly be connected to the clearing of payment transactions.

**It is a definite expectation vis-à-vis market participants that they should create modern, interoperable payment solutions that widen the electronic payment possibilities on the foundations of the instant payment system.** In connection with instant payment services, it must be taken into account that the central infrastructure will only provide basic clearing, recording and communication services to the institutions that join the system; the creation of additional services is the task of market participants. With regard to that, they must also bear in mind that as a result of the changes in legislation concerning payments they may face much more intensive competition than now. Firstly, the simplification of switching accounts and comparing the conditions of payment services, and secondly, the appearance of third-party service providers and their easy access to banks' customers may considerably change customer relations. In order to be able to utilise the advantages of the new system to the maximum possible extent, it is essential that market participants create additional services with which the basic transfer functions can be expanded, and thus they not only become faster, but can be used in a wider scope as well.

**Chart 42**  
**Operating model and liquidity management of the instant payment system**

Banks separate the amount allotted to the prefunding of instant payment transactions on one account.

GIRO keeps records of banks' balances in real time.

Settlement is done simultaneously with clearing.

Complies with the clearing house operating model planned by the ECB.

VIBER will not operate 24/7; therefore, preliminary turnover estimate is needed from banks e.g. for the weekends.

**The MNB's expectation is that, simultaneously with an improvement in service quality, recourse to the instant payment service should not entail perceptible fee rises for the customers who use the service.** The MNB expects that the transaction fees of the central infrastructure operated by GIRO should not increase with the introduction of the instant payment system. Accordingly, payment service providers will be able to use clearing services that are much more developed than the present ones with the same fees as today.

In addition, the MNB also expects of the payment service providers that customers' transaction fees should also not increase to a perceptible degree. In the pricing of the service it should be taken into account that the investment and operating costs of the new payment system may primarily be offset by the increase in income resulting from the higher number of transactions. Accordingly, similarly to the central infrastructure, it is expedient to use the longest possible payback time in the calculation in the case of banking systems as well when setting the fees for the new services. A further expectation is that the instant payment services should be priced by market participants in a structure that stimulates wide use of the new services built upon the system. For payment service providers, implementation of the system can be considered as an investment in the

#### Chart 43

#### MNB's expectations of market participants

The present fee burdens on consumers related to transfers should not increase.

Payment service providers should price in a structure that stimulates the use of the instant payment service.

Development of ancillary services and applications, as well as cooperation in order to implement interoperability.

The MNB expects of market participants to facilitate the successful introduction of instant payment by constructive cooperation.

future. In order to ensure faster growth in the use of the instant payment service than that of the present electronic payment modes, market players must actively participate in the development of the services that are built upon the system (Chart 43).

## 2.2 Regulatory issues of the instant payment system

**Implementation of the instant payment system requires the adoption of a number of new regulatory measures or the amendment of existing rules. Therefore, for the maximum efficiency of the preparation of the payments sector, the detailed rules of the new payment system that will be launched in 2019 will already be announced in 2017.** In Hungary, there are no sets of rules based on the voluntary arrangements of payment service providers, such as the SEPA Rulebook in the case of the euro credit transfers, that can ensure the uniform, standardised application of the given payment method along standard principles; therefore, they are defined in legislation. Accordingly, similarly to other payment methods, the basic rules of transacting instant payments must be determined in legislation. In parallel with the elaboration of new rules, the current legal environment also must be reviewed to be able to provide the safest possible background for the operation of instant payments. Therefore, the legislative issues point beyond the regulation of payments in the narrow sense.

**One of the main pillars of the regulation within the instant payment system is the definition of the basic service and the relevant execution rules.** However, it is not the goal of the regulation to define the range of other payment transactions that may be cleared in the instant payment system. In accordance with the new Payment Services Directive, the execution of instant payment transactions is regulated along a logic that is similar to other payment transactions. It is necessary to regulate the maximum time limit for the execution between the payer's payment service provider and the payment service provider maintaining the payment account of the beneficiary. From the aspect of calculating the execution time limit, the time of the receipt of the payment order by the payer's payment service provider (that can be the account servicing payment service provider or

even the payment initiation service provider) must be determined.

**A new regulatory element will be the detailed definition of the tasks and the relevant time limits related to the messages to be sent in the instant payment system.** It will be necessary to regulate of sending of messages on the non-execution or execution of the payment transaction between the payee's payment service provider and the payer's payment service provider, and of the ones sent to the payee or the payer by its own payment service provider. Other rejection rules and the provisions regarding the investigation procedure of payment transactions without feedback are also related to the above. It is also necessary to determine the detailed rules in the case of request to pay messages that can be sent in advance. The detailed description of the new types of messages and processes entail the corresponding modification and supplementation of the liability regime.

**In addition to the essential regulatory measures regarding the basic service, other detailed rules of operation also need to be laid down and certain effective provisions need to be revised.** The working day of the instant payment, its value date that governs interest calculation and the close-of-business time of working days will also be regulated uniformly. It is necessary to regulate the issues related to secondary identifiers and their use, focusing on the protection of consumers' interests and the prevention of fraud. Amendment of related, non-payment transaction rules is necessary concerning, for example, bank holidays, data processing authorisation regarding the secondary identifier database, required reserve calculation as well as the issues of the closing time of the given day from an accounting aspect. It is also necessary to ensure with legal means the protection of funds made available as collateral by payment service providers for the organisation that operates the payment system.

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## 3 Impact of technological development on payments

Digitalisation and the development of customers' demands have triggered major changes in the field of payments. As a response to the new challenges, many new companies that provide innovative services (so-called fintech firms) appeared in the market, creating strong competition for traditional payment service providers. The changes that took place in regulation

also support the new, innovative players' entry to the market, further increasing the competition in the market of payment services. At the same time, in parallel with the rapid technological development and the spread of innovative payment solutions, one must not forget that their spread should not jeopardise the safe execution of payments and confidence in electronic payments.

## 3.1 Changes caused by technological development in the market of payment services and the appearance of fintech firms

**By the 21st century, access to and use of electronic payment services have become basic needs in developed societies.** Payment services are now similar to public utilities for customers, i.e. they satisfy basic needs like telecommunication services, water-mains or electricity supply. Access to a payment account and some kind of payment card is an important means of access to monthly income. Accordingly, they represent basic services necessary for everyday life.

**The costs of entering the payments market and the costs of bypassing the traditional infrastructures are also high and entail many difficulties.** Until now, new participants' costs of entering the payments market were significant, because expensive infrastructure (branch network, customer service, central IT systems, compliance with regulatory requirements, etc.) had to be installed for the provision of payment services, and initially the significant fixed costs involved meant a disadvantage in terms of economies of scale for newly entering firms. Per customer costs can only be reduced by growth and attracting new customers, but acquiring new customers entails various difficulties. Another solution is the development of a parallel financial system that bypasses the market, although there are serious obstacles to this. Customers tend to be wary of non-bank entities and due to their risk aversion attitude they are reluctant to take their savings from supervised market participants that operate under regulated conditions. Consumer protection regulations often make the provision of new services difficult, or drive service providing market participants amongst traditional players. Financial systems completely independent of the present financial sector existed only in theory until the appearance of virtual currencies, such as bitcoin.

**The traditional infrastructures operating today are unable to completely comply with current consumer expectations and technological possibilities.** In the 21st century, it has become consumers' basic requirement to be able to manage their bank matters continuously, similarly to other areas of life. In addition

to availability, the speed of management has become another important aspect in the accelerated digital world. While it is possible to send electronic mail to remote locations in the world in some seconds and to have conversations in real time between people who are thousands of kilometres from one another, sending funds through the traditional infrastructures takes hours even within the same country, and it may take days in the case of cross-border transactions. The underlying reason is that the operation of the present financial infrastructures is basically determined by data transmission capacities and communication possibilities that are several years or decades old. Neither continuous system availability, nor the immediate execution of payment orders is possible at the earlier technological level. Therefore, developments started in various directions in order to eliminate the deficiencies.

**Technological development and the appearance of new market participants allowed the creation of new, innovative technologies which are based on the traditional infrastructure, but eliminate some of its disadvantages.** Utilising technological developments and the widespread use of the Internet, many new fintech players appeared in the payments market. The appearance of new participants and technologies is typical of not only the payments industry, but their presence is high within the financial sector in the area of payment services, in certain market segments. Using the traditional infrastructures, these firms provide innovative payment services that satisfy today's needs to their customers, thus forcing the traditional players of the market to compete.

**In parallel with the appearance of new market participants, the development of traditional infrastructures also started as a response to the challenges posed by digitalisation. This development is attained by the introduction of the instant payment solutions.** With the appearance of innovative fintech firms, banks find themselves in intensive competition, which jeopardises their market positions and thus

their revenues from payments as well. In order to preserve all of this, banks often have to implement significant developments. It is necessary to improve banking systems and the financial infrastructures that ensure clearing and settlement as well as continuous instant payment services with the quality expected by their customers. Higher development costs may be offset by the expansion in turnover stemming from the higher service level; this expansion may even be significant as a result of directing cash payments towards electronic ones. The renewal of payment systems may mean the beginning of a new era in payments, allowing the utilisation of the advantages provided by technology for all market participants as well as the provision of competitive payment services for customers. Accordingly, the satisfaction of their needs is ensured over the long term in the

widest possible range of payment situations. Instant payment services have already been launched or their introduction is being planned in many countries in the world, including the preparation for the introduction of the instant payment service in Hungary as well.

**With the appearance of virtual currencies, there have also been attempts to completely bypass the financial system.** The original objective of creating bitcoin, one of the best known representatives of virtual currencies, was to have an alternative to centrally issued, controlled currencies. As a result of the shaken confidence in traditional institutions due to the 2008 financial crisis, the inventors of bitcoin created a 'substitute for money' that is able to validate and clear payment transactions without a central counterparty.

## 3.2 Applicability of the technology behind virtual currencies in payments

**Widespread use of virtual currencies – such as bitcoin – in the payments market cannot be expected due to a number of their features compared to the traditional payment methods, but the innovative technology that is behind virtual currencies makes many participants of payments examine these solutions.** Although bitcoin and similar virtual currencies created during the global economic crisis are given significant publicity in the press, they are not expected to be used widely in payment services. Due to the upper limit of and pre-determined expansion in their supply, virtual monies are more similar to commodity monies than the present monies in account. This way of regulating the supply of money also means that, as opposed to money in account, it does not conform to the existing demand for money of the economy. The significant volatility of the exchange rate of virtual currencies is also a consequence of the fact that their supply has an upper limit and the supply expands at a pre-determined rate (Chart 44). At the same time, it also results in limited money functions (e.g. as a measure of value) of the virtual currencies. This is, *inter alia*, the reason for the fact that bitcoin has also spread as a means with speculative objective, rather than as a means of payment.<sup>43</sup>

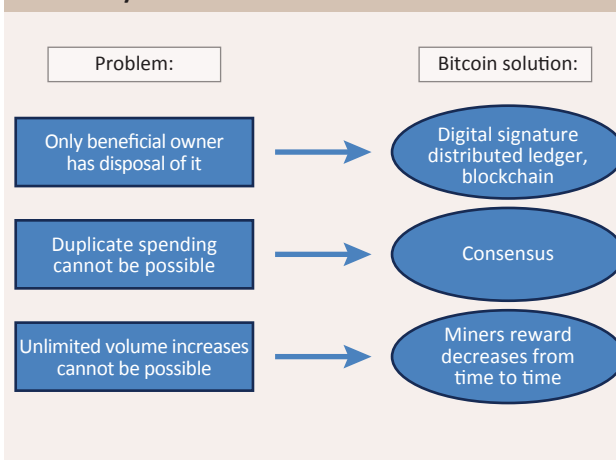
**In the case of virtual currencies similar to bitcoin, stemming from the nature of their functioning, solutions had to be found for new problems.** Contrary to traditional forms of payment, in the case of virtual currencies similar to bitcoin there is no central regulatory and controlling body; therefore, its role is played by the members of the network. During operation, developers had to find solutions to three basic questions (Chart 45). Firstly, it has to be ensured that only the actual owners should be able to dispose of the monies they possess. This is served by the block chain and the distributed ledger technology, based on which it is possible to track the amount of money available for the members of the network. Another problem to be solved was that it should not be possible to spend the same amount of money twice. This is achieved by consensus mechanisms, during which the members of the network validate the individual transactions. The third main issue is the way of expanding money supply, i.e. how the amount of money available for the members of the network is regulated without having a central player. This purpose is served by the rewarding of the ‘miners’ that validate the transactions; as a result, the money supply available in the system expands.

**Chart 44**  
Bitcoin exchange rate  
(September 2011 – September 2016)



Source: <http://bitcoincharts.com>, MNB editing

**Chart 45**  
Three main problems of the functioning of digital commodity monies and the relevant solutions

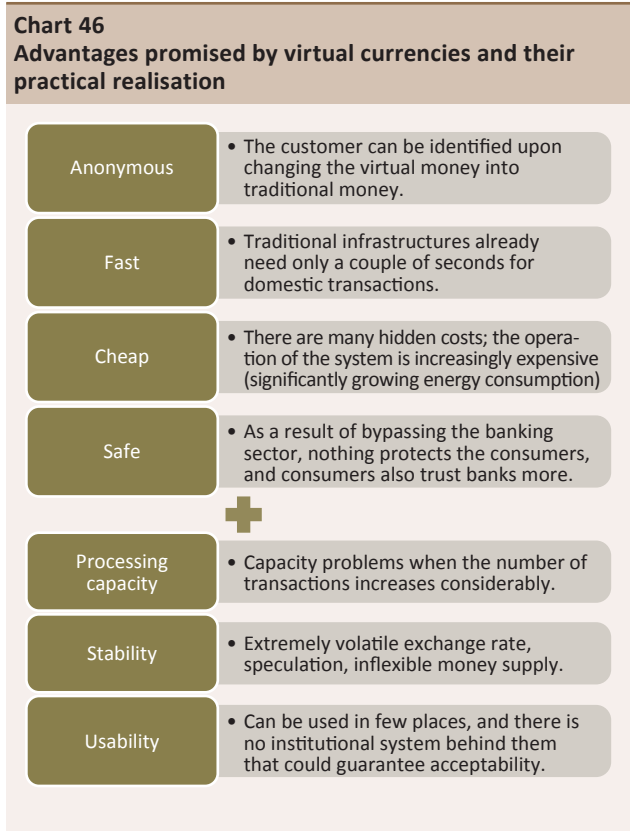


<sup>43</sup> For the risks arising from the unregulated nature of virtual instruments usable for payment see: Payment Systems Report 2014: <https://www.mnb.hu/letoltes/mnb-jfr-2014-junius-eng-digitalis.pdf>

**Virtual currencies promise a number of advantages that are valid only in a limited manner, while traditional payment infrastructures are able to meet these expectations with reliable and regulated operation (Chart 46).** Bitcoin has become a popular topic since its launch, as its promise was an anonymous, fast, cheap and secure financial system that is independent of banks. However, the composition of the network participants has changed significantly since its introduction. While in the beginning the building of blocks and thus the settlements were done by simple personal computers, today the computing tasks necessary for the validation of the transactions are solved in an infrastructure that is run by profit-oriented firms organised in a network. This resulted in a strongly concentrated market, where only some ‘miners’ dispose of most of the network. Firstly, it means that the promise of

the earlier decentralised system is not typical any longer. Secondly, the significant market concentration is the result of the fact that the computing capacity necessary for the validity of the transactions requires increasing resources, continuously adding to their cost as well. As a result, traditional electronic payment methods that may ensure cheaper alternatives are already available in the vast majority of payment situations. Moreover, the clearing time of bitcoin is fixed; 10 minutes elapse until acceptance and 1 hour until finalisation, and today’s modern instant payment systems are already faster than that.

**In order to examine the applicability of the procedures that constitute the technological background of virtual currencies, the MNB joined the cooperation of central banks coordinated by the European Central Bank. This cooperation provides opportunity for wide-ranging exchanges of experiences and information.** The long-term advantages of the opportunities inherent in the distributed ledger technology, which serves as a background to virtual currencies, cannot exactly be seen yet. Nevertheless, their application in payment procedures and in the renewal of financial infrastructures has to be continuously monitored. The possibilities of using distributed ledger technology, which serves as a basis for virtual currencies, are subject to research in various areas of financial services. These developments range, *inter alia*, from the changing of background banking processes through securities settlement possibilities to the examination of virtual monies issued by central banks. Accordingly, actual application of the technology is still a question, and it is not yet possible to form a definite opinion on the inherent long-term possibilities. Applying the new technological solutions in the area of financial infrastructures may become possible when, in addition to their efficiency increasing and innovative features, sufficiently mature solutions are created that ensure the safe, reliable and smooth operation of the system in order to maintain confidence in the financial system.



### 3.3 Impact of the new Payment Services Directive on the operation of Hungarian banks and on fintech companies

**Relying on innovative technical-technological possibilities, by the beginning of the decade new financial-technological service providers appeared, which – entering between payment service providers and customers – provide value added services to their customers on the Internet.** For example, these service providers present the balances of the client's payment accounts held with various payment service providers, or allow their customers to initiate credit transfers through the Internet to the debit of the payment accounts they select. Usually, these new-type service providers already provide the additional payment services from portable devices – from tablets, or increasingly from smartphones, which are becoming widespread these days – through their own applications. At the same time, these services were not covered by the legal and technological rules in force, and thus the legal security, supervision and customer protection during their use could not be guaranteed. Therefore, in addition to making competition and innovation possible, it became necessary to formulate new legislation in order to ensure the transparency of payment services and to increase the safety of payments. In view of that, in the middle of the decade, the uniformly valid Payment Services Directive was revised in the European Union, and the new Payment Services Directive was formulated, which shall be applied also in Hungary from 13 January 2018.

**The most important novelty of the new rules – and at the same time the driving force of innovative payment solutions – is to ensure the non-discriminatory possibility of direct electronic access through the Internet to payment accounts for payment service providers.** The new-type payment service providers, payment initiation service providers and account information service providers provide additional services to their customers based on or in relation to the data of payment accounts. Pursuant to the new Payment Services Directive, account managers must provide non-discriminatory electronic access for other payment service providers to their

customers' payment accounts. This access has to be sufficiently wide-ranging for new-type payment service providers to be able to provide their additional services without obstacles and in an efficient manner, and they may not be required to have contractual legal relations among themselves for this purpose. Access has to be ensured every day of the week, 24 hours a day regarding all services made available by account managers for the customers online for giving payment orders or for the query of account balances.

**In view of the verification of the service providers' reliability and the electronic safety of payments, the new Payment Services Directive subjects the provision of payment initiation services and account information services to conditions.** For the preservation of customers' confidence, the safety of payments through the Internet is a fundamental condition of providing the service. Account information service providers will have a reporting obligation towards the MNB, but payment initiation service providers will have to conduct a licensing procedure. In order to allow the MNB to make sure of the security of the service prior to issuing the licence, the submitted application for the licence should contain – amongst other things – a detailed description of the procedure of managing confidential payment data, security principles, the measures aiming at ensuring business continuity as well as the procedures serving the testing and revision of the above.

**The rules contain a number of IT security provisions, complemented by the so-called Regulatory Technical Standards on strong customer authentication and secure communication.** The most important novelty of security rules is that – apart from a few exceptions – strong customer authentication must be applied in each case when the customer has online access to his payment account through a payment initiation service provider or an account information service provider, initiates an electronic payment transaction or

conducts a high-risk transaction on a remote channel. Strong customer authentication means a procedure when the authentication of the customer's identity is based on the examination of the authenticity of at least two so-called authentication data, falling into two different categories out of possession, knowledge and inherence (typical feature of the customer). The category of possession covers, for example, an instrument suitable for issuing a one-time password or a chip card. Knowledge includes, for example, the password, while inherence – *inter alia* – covers a fingerprint or an iris scan. The requirement of using strong customer authentication solves, for example, the basic security problem of online purchases, as above a certain limit amount, during the payment concluding the shopping, in addition to giving the card data, a unique code assigned to the transaction also needs to be sent back, for which, for example, the customer receives a code to his mobile phone from his account servicing bank following the initiation of the

payment. This procedure has been already introduced by many banks in Hungary.

**Innovation and the appearance of fintech service providers affect the century-old absolutism of classical bank services.** If bank service providers want to preserve their market positions, they must adjust to the conditions of market competition. In addition to the fees of basic services, the activity of the new-type enterprises may also result in fee revenues for them; therefore, it is expedient to cooperate with them and treat them as partners. There are many known cases where the owner of the new-type payment service provider is a bank credit institution or financial enterprise. In order to preserve their role in the market, banks must realise and utilise the competitive advantages offered by the new payment technologies and instant payments, and must determine their position in the new world of digital banking services.

## 3.4 EU cyber risk security awareness survey

**In the MNB's opinion, proper management of cyber risk is an important task. Therefore, it joined the working group set up by the European Central Bank (ECB). The group assesses the IT security awareness of financial infrastructures.** Cyber risk represents increasing threat in financial infrastructures, ultimately jeopardising financial stability and economic growth. This threat increases if the interdependences in financial markets between the system operators and participants are taken into account. Accordingly, cyber attacks may affect several countries. At present, at pan-European level there is no executive body that is able to completely monitor cyber attacks or is able to take adequate measures in a timely manner to protect these countries (with the exception of Europol, although it rather has a coordinating role only; it has no enforcement powers at EU level concerning the prevention of cybercrime, thus significantly reducing the speed of measures that can be taken). A further problem is that cyber risk is not a risk element in the classical sense, as it is intangible, increasingly sophisticated and difficult to quantify its impact in advance. Consequently, market participants must also apply new instruments to protect their operations, and the overseers of financial infrastructures must apply new approaches for a better understanding of cyber

risks. In order to review the cyber risk management practice of European financial infrastructures, in May 2016 the ECB established an international central bank working group, which the MNB joined as well.

**One of the key tasks of the working group is to assess at pan-European level how resistant the individual financial infrastructures are to cyber attacks.** Financial infrastructures are examined not only by themselves, but also in relation to one another (as a kind of network). The goal is to identify the critical nodes in the complex system of financial infrastructures, resulting in sort of a heat map. The ECB is planning to assess the IT security awareness of individual infrastructures in a questionnaire, the compilation of which is the task of the working group. At the national level, the central banks conduct the survey, coordinated by the ECB at the European level. Following the survey, a simulated cyber attack test is also planned to take place. Another objective of the working group is to create a forum where all major participants of the financial sector (financial infrastructures, credit institutions, supervision, regulators) may share their latest cyber risk related experiences, also contributing to the increase in IT security awareness.

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## 4 Glossary

<b>4-hour rule</b>	Pursuant to MNB Decree No. 15/2010 (X. 12.), starting from 1 July 2012 the payment service provider of the payer must assure that Hungarian forint credit transfers generated by customers electronically within the time period specified for same-day execution (i.e. before the final submission time) are received by the payment service provider of the payee within 4 hours of acceptance.
<b>Acquirer (payment card)</b>	The payment service provider with whom the merchant accepting payment for purchases by payment card enters into an agreement to execute transactions. In the course of the clearing and settlement of transactions the acquirer collects and forwards to the merchant the value of card transactions.
<b>Act on Payment Service Providers</b>	Act CCXXXV of 2013 on certain payment service providers.
<b>Additional financial collateral</b>	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.
<b>ATM (Automated Teller Machine)</b>	Automated Teller Machine, through which cash withdrawals as well as other transactions (e.g. credit transfers) can be executed using payment cards.
<b>Batch processing</b>	Simultaneous collective processing of items received at different points in time which are put in the same group if specific features are identical.
<b>BÉTa</b>	Multilateral trading facility (MTF) operated by the BSE as a platform for trading foreign stocks in Hungarian forints. The stocks purchased in the BÉTa market are identical to the stocks listed on foreign stock exchanges.
<b>Blue chips</b>	The most liquid and most traded stocks in a market.
<b>BSE</b>	Budapest Stock Exchange Ltd.
<b>Capital position limit</b>	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.
<b>CEEGEX</b>	Central Eastern European Gas Exchange.
<b>Central counterparty</b>	The central actor that interposes itself between the counterparties and guarantees the settlement of the transaction even when one of the parties fails to fulfil its obligations.

<b>Central securities depository</b>	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).
<b>CGF</b>	Collective Guarantee Fund.
<b>Chip migration</b>	The equipping of payment cards bearing only a magnetic strip with chips, and simultaneously the enabling of devices handling payment cards to accept chip cards.
<b>CIFE Act</b>	Act CCXXXVII of 2013 on Credit Institutions and Financial Enterprises.
<b>Clearing</b>	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.
<b>Clearing and settlement risk</b>	A delay or failure of clearing or settlement in the payment or securities clearing system, despite the fact that the clearing or settlement service is uninterrupted. The term “clearing and settlement risk” is justified by the separation of the two phases (clearing and settlement) in some systems. Depending on the structure of the system, the realisation of clearing risk does not necessarily result in the failure of settlement and settlement risk may occur even if the clearing phase goes smoothly. Clearing and settlement risk may arise from the insufficient liquidity, insolvency or operational problems of participants.
<b>Clearing house</b>	The entity performing the processing, clearing and, in the absence of a settlement agent, settlement of transactions.
<b>CLS</b>	Continuous Linked Settlement. A clearing and settlement model facilitating the elimination of FX settlement risk relying on a multi-currency PvP mechanism. CLS is operated by the CLS Bank.
<b>Collective guarantee fund</b>	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.
<b>CSDR</b>	Regulation (EU) No. 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories and amending Directives 98/26/EC and 2014/65/EU and Regulation (EU) No. 236/2012.
<b>Customer payments</b>	Payment orders generated by the customers of system participants.
<b>Decree on Basic Payment Accounts</b>	Government Decree No. 262/2016 (VIII.31.) on access to basic payment accounts and the features of and charges payable for basic payment accounts.

<b>Decree on Payment Account Switching</b>	Government Decree No. 263/2016 (VIII.31.) on payment account switching.
<b>Designated system</b>	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.
<b>Designating authority</b>	The Magyar Nemzeti Bank pursuant to the SFA.
<b>Direct submitter</b>	A customer who has an agreement with the clearing house exclusively for the direct submission to the clearing house of payment orders relating to its own financial management, pursuant to the authorisation of a direct participant and under a clearing arrangement with such participant, who is not considered a participant in the payment system.
<b>DvD</b>	Delivery versus Delivery. The exchange of securities to securities, which means that the instrument to be exchanged is credited and debited to the parties' accounts simultaneously. Based on the English abbreviation, these transactions are referred to as "...".
<b>DvP</b>	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.
<b>EBPP</b>	Electronic Bill Presentment and Payment.
<b>ECC</b>	European Commodity Clearing AG, a Leipzig-based clearing house acting as a central counterparty mainly for clearing in the energy market.
<b>Eligible collateral</b>	<b>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".</b>
<b>EMIR</b>	Regulation (EU) No. 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories.
<b>ESMA</b>	European Securities and Markets Authority
<b>EuroMTS</b>	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.
<b>Execution</b>	See: settlement.
<b>FGS</b>	Funding for Growth Scheme.
<b>FoP</b>	Free of Payment. A transaction that does not involve any payment at the time of the settlement of a securities transaction.

<b>GIRO</b>	GIRO Elszámolásforgalmi Ltd.
<b>Gridlock</b>	Gridlocks may emerge if orders submitted by one or several participants in the payment or securities clearing system are not settled due to the lack of funds or securities. As a result, the orders of numerous other participants remain unsettled.
<b>Gross clearing</b>	A clearing mechanism whereby only entirely funded transactions are cleared.
<b>Guarantee callable on first demand</b>	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 during the management of default procedures KELER CCP needs to resort to the guarantee callable on first demand in addition to the use of individual and collective guarantee elements, KELER is obliged to make available to KELER CCP funds up to the amount of the guarantee callable on first demand.
<b>ICS</b>	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.
<b>Individual guarantee elements</b>	Collateral required by net clearing systems, which are part of the guarantee system and can be used only if the clearing member providing the security fails to settle (in the case of KELER CCP: basic financial collateral, variation margin, initial margin, additional financial collateral, liquidity FX security deposit).
<b>Information asymmetry</b>	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.
<b>Integrated cooperative banks</b>	Cooperative banks signing the “agreement on the integration of cooperative banks”. They participate in the payment and settlement systems indirectly, through Magyar Takarékszövetkezeti Bank Zrt. as their correspondent bank and they execute their payment transactions through the correspondent bank.
<b>Interchange fee</b>	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.
<b>Interchange Fee Regulation</b>	Regulation (EU) 2015/751 of the European Parliament and of the Council on interchange fees for card-based payment transactions.
<b>Interoperability</b>	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.

<b>Intraday credit line</b>	Given sufficient collateral, the settlement agent (mostly the central bank) provides intraday credit lines to system participants to facilitate the prompt execution of the payment orders cleared in the system. The scope of eligible collateral is determined by the settlement agent. The credit line and the current account balance of participants together comprise the liquidity available as collateral for payment orders.
<b>Issuer (payment card)</b>	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.
<b>KELER</b>	Központi Elszámolóház és Értéktár Zrt. (Central Clearing House and Depository Ltd.).
<b>KELER CCP</b>	KELER KSZF Központi Szerződő Fél Zrt. (KELER KSZF Central Counterparty Ltd.).
<b>KID system</b>	A system that ensures electronic communication between KELER and its clients.
<b>LEI</b>	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.
<b>Liquidity</b>	The totality of financial instruments that can be used to settle orders in payment and settlement systems.
<b>Liquidity bound</b>	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.
<b>MICL</b>	Maximum Utilisation of the Intraday Credit Line. An indicator calculated for the usage of the central bank's intraday credit line which shows the maximum percentage used on a given business day for the settlement of orders.
<b>MiFID, MiFIR</b>	Markets in Financial Instruments Directive and Regulation.
<b>MNB</b>	Magyar Nemzeti Bank.
<b>MTF</b>	Multilateral (alternative) Trading Facility.
<b>MTS</b>	The multilateral trading facility operated by EuroMTS.
<b>Net clearing</b>	In the process of netting, the conversion of the payables and receivables of clearing members vis-à-vis one another into a single payable or receivable by deducting the receivables from the payables. Netting may be bilateral or multilateral. The next step is the settlement of the net debit positions thus calculated. In case of insufficient funds, the guarantee system of net clearing must be activated.

<b>New Payment Services Directive</b>	Directive (EU) 2015/2366 of the European Parliament and of the Council on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No. 1093/2010, and repealing Directive 2007/64/EC.
<b>NFKP</b>	Daily Natural Gas and Capacity Trading Market.
<b>OTC</b>	Over the Counter market (including MTF and OTF platforms).
<b>OTF</b>	Organised Trading Facility.
<b>Participant</b>	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.
<b>Payment account</b>	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.
<b>Payment Accounts Directive (PAD)</b>	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.
<b>Payment service provider</b>	A credit institution, institution issuing electronic money, institution operating the Postal Clearing Centre, payment institution, the MNB and the Treasury offering payment services.
<b>Payment Services Act</b>	Act LXXXV of 2009 on the Pursuit of the Business of Payment Services.
<b>Payment Services Decree</b>	MNB Decree No. 18/2009 (VIII. 6.) on payment services activities.
<b>Payment Services Directive</b>	Directive 2007/64/EC on payment services in the internal market.
<b>Payment system</b>	In the case of the overseen systems, the form of cooperation based on an agreement between cooperating parties to run the system specified in Section 6(1)27) of the Act on Credit Institutions. It is a part of the financial infrastructure, including the different payment instruments, bank procedures as well as interbank payment systems, which in combination facilitate the execution of payments.
<b>PFMI</b>	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.
<b>POS terminal</b>	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.

<b>Post-trading infrastructure</b>	The group of institutions performing clearing and settlement functions after the conclusion of a transaction.
<b>Potential liquidity</b>	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.
<b>PSD</b>	See: Payment Services Directive.
<b>PSD2</b>	See: new Payment Services Directive.
<b>PvP</b>	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.
<b>Queue management</b>	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.
<b>Risk of service continuity</b>	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.
<b>SCT</b>	SEPA credit transfer.
<b>SDD</b>	SEPA direct debit.
<b>SecuRe Pay Forum</b>	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.
<b>SEPA</b>	Single Euro Payments Area.
<b>SEPA End Date Regulation</b>	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.
<b>Settlement</b>	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.
<b>Settlement agent</b>	An organisation that maintains the settlement accounts of the entities participating in the payment and securities settlement system and the account of the central counterparty, ensuring the settlement of orders. If necessary, it grants credit to an entity or the central counterparty for the purpose of facilitating settlement.

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<b>SFA</b>	Act XXIII of 2003 on Settlement Finality in Payment and Securities Settlement Systems.
<b>Social cost</b>	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.
<b>System operational interdependency risk</b>	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.
<b>T2S</b>	TARGET2-Securities. Pan-European settlement infrastructure for the settlement of transactions in European securities markets.
<b>TEA</b>	Exchange Settlement Fund.
<b>Third party, external service provider</b>	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.
<b>Trading</b>	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.
<b>Trading Platform</b>	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.
<b>VIBER</b>	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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