



PAYMENT SYSTEMS REPORT



2014

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

King Louis I. (‘The Great’)



PAYMENT SYSTEMS R E P O R T

2014

Published by the Magyar Nemzeti Bank

Publisher in charge: Eszter Hergár

H-1054 Budapest, Szabadság tér 9.

www.mnb.hu

Pursuant to Act CXXXIX of 2013 on the Magyar Nemzeti Bank, the primary objective of Hungary's central bank is to achieve and maintain price stability. One of the main responsibilities of the Magyar Nemzeti Bank (MNB) as set forth in the Act on the Magyar Nemzeti Bank is to promote the smooth execution of payments and to facilitate the reliable and efficient functioning of the payment and settlement systems. The sound and smooth functioning of payments and the payment and settlement systems are essential for the execution of real economic and financial transactions.

The purpose of this Report is to present a comprehensive review of trends in the field of payments and the operation of the overseen payment and settlement systems, the main risks and the measures taken by the MNB to fulfil its above responsibilities. In publishing this report, the MNB wishes to contribute to enhancing the transparency of its activities in relation to payment and settlement systems and the execution of payments, while also endeavouring to enhance financial literacy and hence, 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 Dr Ferenc Gerhardt, Deputy Governor. Contributors to the Report included: Patrik Gergely Balla, László Bodnár, Éva Divéki, Miklós Fenyvesi, Tamás Ilyés, Miklós Luspay (Head of Department), Annamária Madarász, Henrietta Olasz, Beáta Papp Kovács, Cecília Pintér, Kristóf Takács (project manager), 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 17 March 2014 and 2 June 2014, and at the Monetary Council meeting on 13 May 2014.

The MNB staff relied primarily on information relevant to 2013, although in a forward-looking manner the Report also analyses the ongoing developments observed in the course of 2014.

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Key messages

Despite the increased costs engendered by the introduction of the transaction tax, there was no large-scale, rapid adjustment in the payment habits of economic agents in 2013.

The use of electronic payment instruments increased in line with previous trends. The slow increase in the use of electronic payment methods and the decline in the use of cash continued, but the rate of change remains below the desired level. The previous trends may have changed following the introduction of the transaction tax even over the short term, although an analysis of payment statistics for 2013 reveals that a rapid and pronounced adjustment to increased payment costs failed to materialise both in the case of household and corporate customers. Households' supply with payment instruments did not change considerably; thus it is unlikely that the ratio of unbanked increased significantly.

Despite the slow convergence observed in the use of electronic payment instruments, the efficiency of payments still lags far behind in a European comparison.

In Hungary, a considerable portion of the adult population has a bank account and the ratio of regular income transferred to the accounts is sufficiently high for the increased use of electronic payment instruments. The value of credit transfers, the payment method with the largest turnover, is 15 times larger than GDP, a ratio only slightly lower than the European Union average. As regards the use of electronic payment in retail and other purchase situations, and the electronic payment of utilities and other services, there is still ample room for improvement.

Regulatory developments in recent periods, in particular, the introduction of the financial transaction tax, have significantly changed the pricing practice of payment service providers, and further regulations may have additional effects this year.

As a result of the financial transaction tax introduced in 2013, the pricing of payment services has changed significantly. Banks passed on the tax gradually and following the increase in the rate, adjustment was complete by October 2013. Most providers passed on the tax directly and completely, but in case of card payments they priced in the tax indirectly in annual card fees. The pricing of payments is expected to change further as a result of the introduction of free cash withdrawals in 2014 and the reduction of interchange fees.

In 2013 the costs of payment services increased substantially for households, compensated partially by the option of free cash withdrawals from February 2014 and stronger measures on consumer protection.

The level of the price increases was different across payment services; in some cases the costs of cash withdrawal more than tripled in 2013. Previously, between April 2011 and the beginning of 2013, the general costs of payment transactions for households had remained largely the same, despite the increased use of electronic payment methods. Fixed items, the dominant element in payment charges, increased significantly last year, despite the direct pass-through of the transaction tax to transaction fees. The fee burdens borne by customers may ease as a result of the MNB's ongoing series of investigations in the field of consumer protection. In this regard, in March 2014 the MNB already obligated numerous payment service providers to repay the extra revenues from payment charges which were increased in an illegitimate way and to terminate their violations.

In 2013 real economy and financial transactions were executed safely and efficiently by the overseen systems.

Risks to overseen systems have not increased compared to the previous year. The operation of the overseen systems was highly reliable. The improvement in transaction execution time between participants and between customers exceeded expectations. Turnover of the payment systems and securities clearing and settlement systems increased slightly in value relative to the previous year. There was ample liquidity to cover these transactions both at the system level and at individual bank level.

Credit transfers through the Interbank Clearing System's intraday clearing are credited to the beneficiary's account within two hours on average instead of the legally required four hours.

The average duration of clearing and settlement is 10 minutes per intraday clearing cycle; processing time also depends on the number of transactions to be cleared in the given cycle. In 2013 this duration did not exceed 15 minutes even during the cycle with the highest volume. According to the analysis of the turnover of direct ICS participants, customers can expect to have a two-hour execution time during the five intraday clearing cycles of the ICS.

Following the introduction of ICS intraday clearing, by the middle of 2013 adjustment to the new system was complete. As a result of banks' adjustment, the launch of the Funding for Growth Scheme did not increase the clearing and settlement risks in VIBER.

Since the introduction of the multi-cycle ICS intraday clearing, in contrast to their previous practice, customers execute many payment orders through the ICS rather than VIBER. Another effect of the adjustment process was the timing of transactions by VIBER participants, which had shifted noticeably later during the day in the second half of 2012 and this practice became permanent in 2013. As a result of the Funding for Growth Scheme (FGS) launched in 2013, the ratio of securities pledged in favour of the MNB and available as an intraday credit line for payments has declined within the security portfolio. In order to retain the liquidity required previously for their payment transactions, from August 2013 banks continuously increased their stock of securities pledged in favour of the MNB.

Owing to the transformation of the MNB bill into a central bank deposit, banks must ensure sufficient liquidity for the execution of their transactions in the payment system.

As of 1 August 2014, the MNB bill will be eliminated and transformed into a central bank deposit. As opposed to the MNB bill, however, the new instrument will not be eligible as collateral accepted by the MNB. Since the two-week MNB bill constituted the bulk (nearly 40 per cent) of the securities pledged by banks as collateral, the new regulation requires adjustments both at the level of the payment system and at individual bank level. According to the MNB's calculations, in order to ensure the execution of payments on an individual bank basis, the banking sector must provide additional collateral of HUF 500 billion to replace the MNB bill.

If a smaller bank or a new market participant takes over the functions of a larger bank withdrawing from the Hungarian market, the risks arising in the payment and settlement systems will change only marginally.

Changes in the market structure of the banking sector exert an impact on the operation of payment systems and the market of payment services as well. The impact of a larger bank's exit on the payment systems depends on numerous factors; nevertheless, neither possible scenario is expected to generate a substantial increase in risks. Likewise, transformation of the cooperative bank sector in 2013 had no negative impact on the operation of the payment systems.

The Magyar Nemzeti Bank purchased the entire block of shares of GIRO Zrt, the operator of the Interbank Clearing System; consequently, the third basic element of the financial infrastructure has come under majority national ownership after the MNB-operated VIBER and KELER Group, the operator of the securities clearing and settlement system.

Essentially, the acquisition by the Bank served three goals. First, the MNB is determined to ensure that bank customers have access to payment services as inexpensively as possible compared to the expensive services offered by the previous, profit-oriented operational model of the Interbank Clearing System. Secondly, as an institution responsible for the operation and development of Hungary's financial infrastructure, by purchasing GIRO the MNB can more efficiently facilitate the required payment system developments that serve customers' interests. Thirdly, the MNB considers it important to have companies forming the background infrastructure of payment services in national ownership, similarly to other public utility companies in monopolistic positions.

Pursuant to the requirements of the EU regulation on central counterparties (EMIR), Keler CCP must renew the licences allowing it to perform central counterparty functions.

In line with the requirements of EMIR, on 13 September 2013 Keler CCP submitted its application for the renewal of its licence to the supervisory authority. The re-licensing process will be concluded in the third quarter of 2014 at the latest. In order for Keler CCP to meet the requirements of EMIR and the Regulatory Technical Standards as secondary regulation, the Keler Group underwent an organisational and structural transformation in 2013. In the context of this transformation, Keler transferred the clearing function of guaranteed markets to Keler CCP; furthermore, a capital increase was implemented at Keler CCP. In addition, the risk management model of Keler CCP was revised and new services were included among those offered by Keler CCP.

Owing to the increased payment audit spectrum resulting from the integration of supervisory functions into the MNB, as well as its more pronounced policy measures, the efficiency of the payment audits is expected to improve further from 2014.

Integration of supervisory functions into the MNB allows for the unified, high-quality auditing of payments legislation. All of this may help enforce payment service providers' compliance with regulations more efficiently, which should improve customers' confidence in the financial sector. According to the audits performed in 2013, payment transactions were basically executed in compliance with regulations; however, the MNB investigated non-compliance cases and imposed fines in the case of six credit institutions.

In a letter of intent, the MNB declared its commitment to including the forint in the CLS¹ system by which the foreign exchange settlement risk of foreign exchange transactions against the forint may be eliminated from the second half of 2015.

With a view to eliminating the substantial foreign exchange settlement risk borne by the Hungarian credit institution sector and strengthening the stability of the financial system, the MNB decided to include the forint, in cooperation with CLS, in the CLS clearing and settlement model operated by the CLS Bank. After the issue of the letter of intent by the Financial Stability Board in January 2014, the diligence phase of accession began. The stakeholders of the project will carry out the tasks identified and coordinate the operative processes in the framework of the implementation phase to be concluded in mid-2015. In order to facilitate successful accession, the MNB is cooperating with the Hungarian Banking Association, the Hungarian Forex Association and the banking sector as a whole.

Elimination of ICS overnight clearing may improve the efficiency of the system, and further acceleration of credit transfers may promote the widespread use of electronic payment methods.

Elimination of overnight clearing may improve the efficiency of the Interbank Clearing System and reduce the operating costs of the ICS which, in turn, may reduce service fees. Further acceleration in processing customers' credit transfers may also improve the conditions associated with the use of electronic payment instruments. This could also be facilitated by increasing the frequency of clearing cycles or, by the introduction of real-time credit transfer services, which could offer an alternative to cash usage in several new payment situations and mitigate the motivation for cash usage stemming from the lack of confidence among economic agents.

The fast technical progress in mobile devices seen in recent years may also foster the development of electronic payment services.

In several new payment situations mobile payment methods may open up the possibility for electronic payments besides cash; in addition, they may reduce the costs of implementing and operating the infrastructure required for the execution of transactions. Developments should ensure equal access for all participants concerned. Extensive cooperation of all market participants is required to ensure that domestic developments adequately support the improvement of the efficiency of payments.

¹ Continuous Linked Settlement

1 Introduction

One of the main responsibilities of the Magyar Nemzeti Bank (MNB) as set forth in Act on the MNB is to promote the smooth execution of payments and the reliable and efficient functioning of the payment and settlement systems. If fast, secure and cost-efficient electronic payment methods were more broadly used by economic agents, it would allow for significant savings of resources at the level of society. This requires, however, the possibility of the simple and safe use of electronic payment instruments besides cash usage in most payment situations, at low and transparent costs. In addition, it is also essential to ensure that the Hungarian payment and settlement systems support the execution of the real economic and financial transactions initiated by economic agents by providing high quality services in accordance with regulations. Consequently, oversight of the payment and settlement systems is a key responsibility of the 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 acts mostly 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 when making 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, to reduce the resource requirement of transactions and to combat the shadow economy, which may in turn promote economic growth. In addition to its role as a catalyst, the MNB also regulates the execution of payments and can thus influence the market of payment services via requirements laid down in decrees issued by the Governor of the MNB. Compliance with the requirements set out in decrees and in the Act on the Provision of Payment Services is monitored by the MNB.

The first part of this Report presents the trends in the development of Hungarian payment methods and instruments,

as well as the changes affecting the efficiency of payments, and developments related to the operation and oversight of the Hungarian payment and settlement systems. In addition, it addresses the audit experiences pertaining to the execution of payments, current issues in domestic and international regulatory activities, and the organisational and operational transformation of the securities clearing and settlement system. The Report subsequently provides a detailed description of three current topics relevant to domestic payments and the Hungarian payment systems.

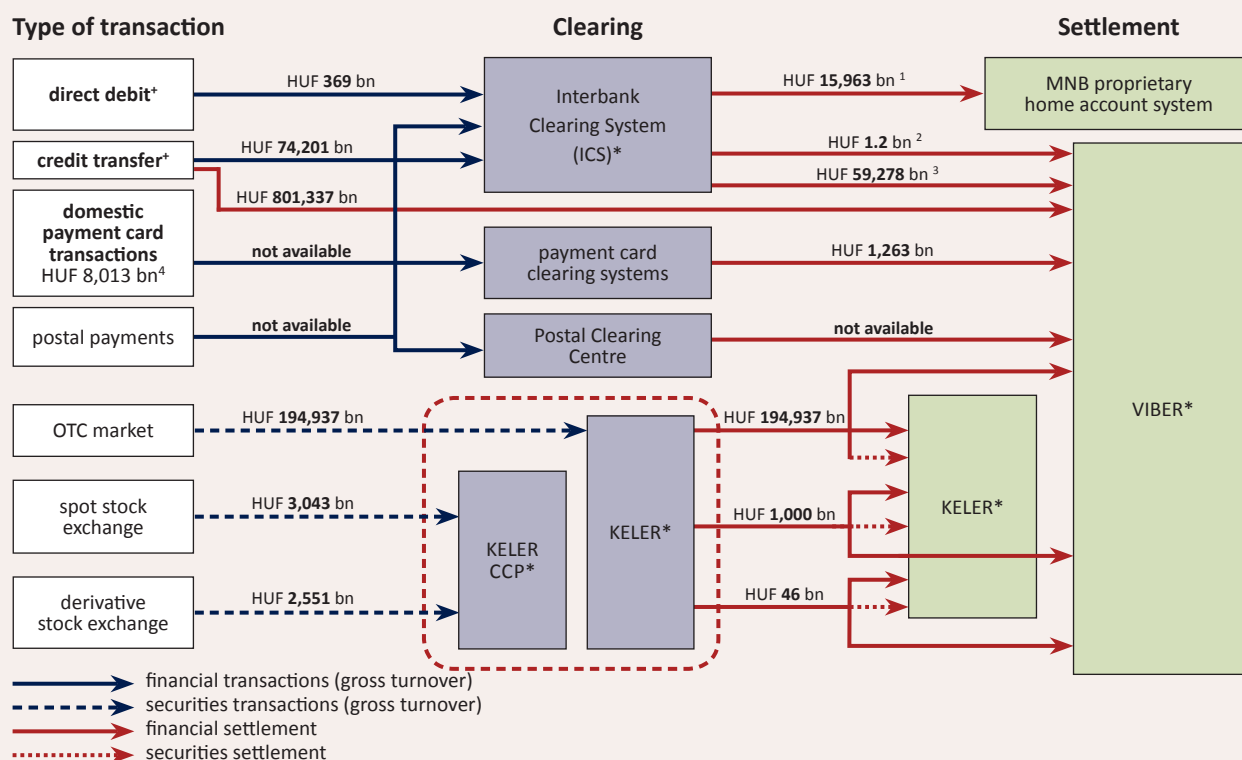
- In relation to the regulatory changes affecting payments in recent periods, the pricing of payment services have come into focus as a factor that may influence the use of electronic payment instruments over the long run. In addition to analysing the effects of regulations, it is essential to monitor the pricing of payments on a continuous basis, which will be made possible by the payment pricing monitoring system developed by the MNB in 2014.
- Monitoring the liquidity of payment systems is an important task in order to ensure the smooth execution of transactions and to maintain confidence in the financial intermediary system. The liquidity of the overseen systems was influenced, to a significant degree, by two factors in 2013: the launch of the Funding for Growth Scheme and adjustment to the intraday clearing system. Adjustment to the transformation of the two-week MNB bill is expected to have a substantial impact on the liquidity of the systems in 2014.
- Through the continuous enhancement of payment services and the payment and settlement systems the efficiency of the execution of transactions can be improved and services can become faster and cheaper. In respect of enhancements, however, the safety of payments and the risks related to new solutions should be constantly borne in mind. Accordingly, the MNB continuously monitors and encourages the development of payment services and, in numerous cases, it also participates actively in these developments.

2 The operation of the domestic payment system

The smooth execution of payments and the reliable and efficient operation of payment and settlement systems are crucial for the conduct of real economic and financial transactions. Account-based payments and securities transactions require centralised systems for the clearing and settlement of transactions. The payment system for large-value, time-critical HUF credit transfers is the Hungarian Real-Time Gross Settlement System (called VIBER). Small-value HUF credit transfers and direct debits are cleared in the Interbank Clearing System (ICS). 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. Capital market transactions are executed in the securities clearing and settlement system operated by KELER; in the case of guaranteed markets KELER CCP also participates as the central counterparty. If the clearing and settlement of payments and securities transactions are carried out separately, settlement generally occurs in central bank money, on accounts kept in the MNB (in the proprietary home account system of the MNB or in VIBER) (Chart 1). The oversight activity of the MNB covers the operations of the VIBER, the ICS, KELER and KELER CCP.

Chart 1
Overview of Hungarian financial infrastructure



¹Transactions settled in the overnight clearing system, in which transactions differ from direct debit and credit transfer are also settled.

²Transactions settled in the second cycle of the overnight clearing system (due to queuing or late submission).

³Electronic credit transfers settled in the intraday clearing system from 2 July 2012.

⁴Only the interbank part of total payment card transactions is cleared in the payment card clearing systems.

* = On-us transactions are not included.

* = Overseen systems.

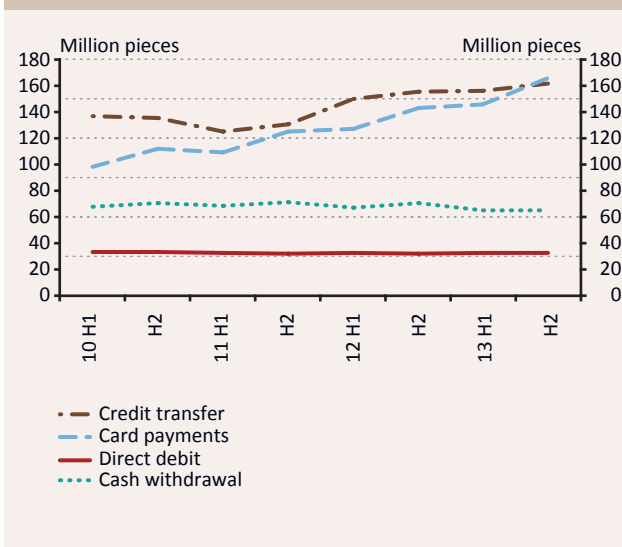
2.1 Development of payment methods and instruments

2.1.1 THE USE OF ELECTRONIC PAYMENT METHODS

Domestic payment methods and instruments developed in line with the previous trends in 2013 as well, and the slow spread of electronic payment instruments continued at roughly the same pace as seen before. Before the introduction of the financial transaction tax, several expectations were voiced in respect of the effect the changed cost structure would have on the execution of payments. According to one of the assumptions, the use of electronic payment methods may become more intensive due to the higher charges on cash withdrawal, while the other assumption expects a decline in the turnover of electronic transactions due to the general increase in the costs of payment transactions. Since customers using payment services faced increased charges in spring 2013 for the first time, only a small degree of adjustment was expected for the first half of last year. Based on the analyses of autumn 2013, neither households nor corporate customers adjusted their payment habits as a result of the changed cost structure in the first half of last year. In respect of households' payment habits, the previously observed trends continued and accordingly, the share of purchases made with cards increased within payment card turnover. In the first half of the year, the payment habits of corporate customers did not reflect any trend of relocating transactions abroad or merging transactions in order to reach the duty threshold.² Based on the payment statistics data pertaining to 2013 H2, the structure of Hungarian payment turnover did not change materially as compared to previous years³ (Chart 2).

Households' payment habits did not change significantly in 2013: the turnover of payment card purchases increased in line with previous trends and the number of cash withdrawals declined, while the total value of withdrawals increased slightly. Changes in the payment habits of households can be monitored adequately by tracking the changes in the turnover of payment card purchases and cash withdrawals. It can be assumed that any significant changes in the payment habits

Chart 2
Turnover of main transaction types related to payment accounts



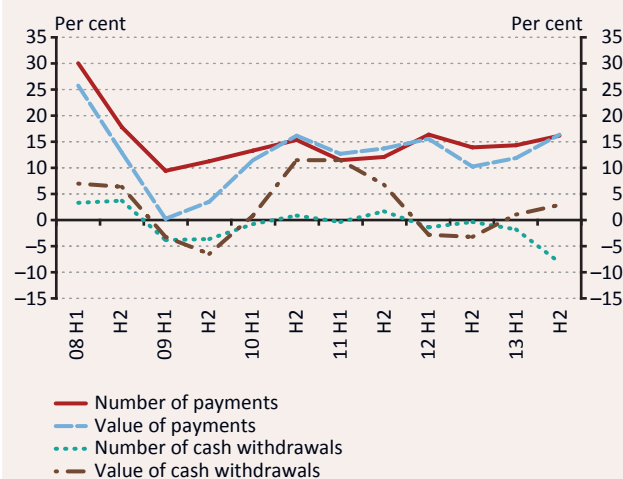
of household customers would be reflected primarily in the turnover of these two transaction types. There were 312 million purchases with payment cards in 2013, up 15.4 per cent compared to the previous year, while the total value of payments reached HUF 2,327 billion, up 14.3 per cent. In the case of card transactions, it is worth noting the turnover of remote – typically online – card purchases. The increase in the turnover of remote card purchases exceeded the increase in the turnover of traditional transactions substantially, with a 33 per cent increase in the number of transactions within a year. The number of cash withdrawals with payment cards decreased by 5 per cent in 2013, which is a larger decline than seen before. The total value of the 117 million transactions amounted to HUF 6,117 billion, up 2.1 per cent compared to the previous year. The average amount of cash withdrawn by card increased by HUF 4,000 in 2013 and now exceeds HUF 52,000. As regards regular payments, the number of core direct debits used primarily by household customers increased slightly by 0.7 per cent. Based on the changes observed in

² Turnover data for the first half of 2013 are analysed in detail in the March issue of the MNB Bulletin in Ilyés, Tamás – Takács, Kristóf – Varga, Lóránt: Changes in the fees on payment services and the structure of payments following the introduction of the financial transaction duty.

³ The detailed payment statistics are included in the payment table set available on the MNB's website: http://english.mnb.hu/Statistika/data-and-information/mnben_statistikai_idosorok/mnben_penzforgalmiadat_en/payment-data/payment-table-set.

respect of the use of payment cards, the turnover of card purchases increased further and accordingly, the efficiency of the execution of payments improved in this respect (Chart 3).

Chart 3
Annual growth rate of transactions made by payment cards



Developments in the turnover of payment methods used primarily by corporate clients did not reflect a significant adjustment to the changed cost structure stemming from the introduction of the financial transaction tax. In 2013 the number of forint-denominated credit transfers rose by 5 per cent, with a 4.7 per cent increase in total value compared to the previous year. The number of foreign currency transfers increased similarly, but their total value declined by 6.5 per cent. The number of credit transfers initiated in batch increased slightly last year. The number and value of cash withdrawals in bank branches, typically initiated by corporate clients, continued to decline in 2013, the rate of the decline surpassed that seen in the previous year. The number of cash withdrawals dropped to 12.5 million, down 11.6 per cent compared to 2012. The rate of decline in the turnover of cash deposit transactions decelerated last year: the 30.2 million transactions reflect a 4.6 per cent decline compared to the previous year, while the total value of transactions dropped by 6 per cent. In conclusion, corporate payment habits did not reflect a fast and significant adjustment following the introduction of the financial transaction tax.

Similarly, there were no significant changes last year in the payment instruments used by customers for the execution of payments, and customers did not appear to shift to the use of cash in large numbers. In addition to turnover data, it is important to examine changes in the payment accounts and payment cards of customers using payment services,

as the number of users of the services can be derived from these figures, and thereby conclusions can be drawn as to whether the changes in turnover resulted from a change in payment habits or a change in the number of users. Based on the regulatory developments of recent periods, this might be an important aspect in the case of households primarily, because of the risk that large numbers of customers may decide to terminate their banking relations due to the increase in payment charges. Re-channelling the former electronic payment turnover to cash usage is simpler and faster in the case of households than in the corporate segment. Following the increase seen in previous years, by the end of 2013 the number of payment accounts of natural persons declined by 150,000 year-on-year, but compared to the 10 million household accounts this change is not significant. Some of the cancelled accounts were presumably inactive accounts. The number of accounts of enterprises and other institutions did not change significantly. Based on the breakdown of accounts by denomination, the number of FX accounts decreased at a faster rate than that of forint accounts. In line with the trends of recent years, the number of payment cards did not change substantially in 2013; the slight increase observed can be primarily attributed to the rising number of cards held by household customers. As opposed to the increase seen in previous years, the share of debit cards within payment cards dropped to 84.7 per cent by the end of 2013, down 1 percentage point. The most important conclusion that can be drawn from this is that clients with more than one banking relation reduced the number of services used by them, while presumably, the share of those not having any banking relations at all did not increase.

The security of electronic payment services is ensured, and the ratio of payment card related fraud to total turnover remains low. The secure execution of electronic payment transactions and keeping fraud at low levels are crucial in maintaining confidence. In the first half of 2013, 0.003 per cent of domestic payment card transactions was related to fraud, while this ratio is one tenth within the turnover of the domestic acceptance network. Based on these figures, in Hungary the ratio of payment card related fraud is low even in international comparison. Two trends could be observed in recent years in respect of card related fraud. On the one hand, a substantial part of fraud transactions affects cross-border turnover; on the other hand, the ratio of remote payment fraud, particularly, on-line fraud events, is increasing. In order to curb cross-border fraud, especially foreign payment service providers should step up security levels and carry out developments aimed at improving security. In the case of on-line fraud, there is a possibility of using supplementary security services, where, besides data displayed on the cards, additional information is required for initiating a transaction. Such possibilities include

one-time passwords or the provision of supplementary codes only known by the cardholder. Payment service providers, including domestic providers, have already started to phase in these services.

2.1.2 DEVELOPMENT OF THE PAYMENT CARD ACCEPTANCE NETWORK

The development of the payment card acceptance network should remain in the focus of attention as in most retail trade transactions only card payment solutions can offer an efficient alternative to cash usage. In 2013, the rate of development of the payment card acceptance network decelerated somewhat compared to the trends seen in recent years and accordingly, at end-2013 the number of POS terminals enabling card acceptance exceeded 90,000 at a total of 74,000 acceptance points. Thus the 6.5 per cent year-on-year increase in the number of POS terminals lags behind the growth rate observed in previous years. While bank cards are accepted in most retail sales units with a larger turnover, numerous units with a smaller turnover still accept cash only, without offering any electronic payment option. Enabling the use of electronic payment in retail trade may improve the efficiency of payments and contribute to curbing the hidden economy. Based on payment statistics and international comparison, the expansion of the card acceptance network should be accelerated. With that in mind, options for subsidies encouraging development should be explored, and the possible ways in which new technical solutions could accelerate the expansion of the network over the short term should be studied.

The results of the POS terminal installation programme carried out in Fejér county in 2013 failed to meet the expectations of the participants; however, during the period of the programme the rate of installation nearly doubled in the county compared to the nationwide average. With the participation of the MNB, the Hungarian Banking Association, the Chamber of Commerce and Industry of Fejér County, two international card brands and six payment service providers, 2013 Q4 saw the implementation of a subsidy programme, in the context of which merchants located in Fejér county were offered preferential terms to obtain POS terminals. Payment service providers offering acceptance services installed a total of 114 POS terminals, with nearly half of the terminals installed at retailers with annual sales revenue under HUF 10 million. The failure to meet the earlier expectations may be attributed to numerous factors. Merchants' willingness to participate was restricted due to the numerous merchant tasks related to the purchase of on-line teller machines, the significant delays in the preparatory phase of the programme and thus the prolongation of the installation into the Christmas period.

It is important to note that some merchants declined the introduction of card acceptance even at a low cost, possibly because of a preference for less traceable cash usage. The motives of the stakeholders should be explored further based on the experiences of the installation programme along with possible public policy measures aimed at ensuring the more widespread use of efficient electronic payments in retail trade.

2.1.3 EFFICIENCY OF DOMESTIC PAYMENTS IN INTERNATIONAL COMPARISON

In Hungary, a considerable part of the adult population holds a bank account and the ratio of regular income transferred to the accounts is sufficiently high. A pre-requisite for the use of electronic payment services is the existence of a payment account and a credit balance on the account, to which electronic payment transactions can be debited. From the perspective of the efficiency of domestic payments, the number of payment accounts among Hungarian citizens and the value of wages, pensions and other regular income transferred to those accounts are crucial issues. The exact ratio of incomes transferred to the accounts is hard to establish; however, this ratio is available for several sub-items. In 2013, 68 per cent of Hungarian pensions were paid through electronic channels. There was a slight decline compared to previous years: in 2012 around 69 per cent of pensions were paid by credit transfers initiated in batch. For lack of detailed statistics, this ratio can be estimated only indirectly in the case of labour incomes, but a slightly higher ratio can be assumed based on the ratio of economically active Hungarian account holders and the turnover of credit transfers initiated in batch that are typically used for the payment of regular incomes. Based on estimates, the total ratio reaches 90 per cent in the European Union. While these estimates, apply to reported, legal incomes only, it can be established that Hungary's shortfall in this respect is insignificant compared to the EU average.

The number of households' payment accounts and cards, as well as the ratio of regular incomes transferred to the accounts would allow for the payment of most transactions by electronic means. The three indicators applied by the MNB to gauge the level of development of domestic payments suggest that, despite slow convergence, Hungary still lags significantly behind EU Member States in the use of electronic payment methods. The MNB uses three main indicators to examine the level of development of Hungarian electronic payment transactions in international comparison. These indicate the extent to which electronic payment methods are used in the three most frequent payment situations (Table 1). They are used to determine the extent to which electronic payment methods are used for the payment of utility bills, other service

charges and retail purchases on the one hand, and the ratio of credit transfers to GDP on the other hand.

The ratio of credit transfers – the electronic payment method used most frequently by economic agents – to GDP is close to the EU average. The annual amount of credit transfers initiated by bank customers in Hungary is almost 15 times larger than GDP and is thus only slightly lower than the EU average of 17.8 times. At the current growth rate, the Hungarian indicator may catch up with the current European Union average in the span of a few years. Consequently, it is clear that in Hungary the execution of payment transactions is intensive, with 15 times the amount of the gross national product being handled by the payment systems.⁴

As regards the use of electronic payment in retail sales and other purchase circumstances, there is still ample room for improvement. The indicator of electronic purchases compares the amount of payments made with payment cards or other card-based or electronic solutions (e.g. mobile payment) to total household consumption. Owing to the less widespread

use of innovative payment methods, this ratio is practically identical to the ratio of payment card purchases in Hungary. In 2013 this number was only slightly above 13 per cent in Hungary, whereas the European average is nearly triple this rate, at 37 per cent. Although less dynamic progress has been seen in this area, the ratio has increased over the past two years thanks to faster growth in card payments.

In respect of the electronic payment of utility bills and other service charges, Hungary lags significantly behind the European Union average. The payment of permanent, regularly due service charges⁵ is a special payment situation that affects nearly all households. In 2013 users of these services paid only 24.3 per cent of the estimated annual value of these account payments by means of electronic payment methods, while this figure may be as high as 70 per cent in the EU according to the MNB's estimate. Positive, albeit slow, developments can be observed in Hungary in the area of cashless payment of utility bills: the use of paper-based, cash payment services is gradually declining and being replaced by electronic payment methods.

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

Indicator	Calculation method	Hungary 2012	Hungary 2013	European Union 2012
Credit transfers	Annual value of credit transfers / GDP	14.5	15.3	17.8
Electronic payment of retail purchases	Annual value of payments made by payment cards or other electronic solutions / Annual household consumption	11.8%	13.0%	37.3%
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%	70%*

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

⁴ These figures do not include the value of interbank transfers initiated in the Hungarian RTGS, which amounted to 31.4 times the value of GDP in 2013.

⁵ Such charges include utility bills and the fees charged for telecommunications and insurance services, as well as any other regularly paid charges.

2.2 Operation of the payment and settlement systems

In 2013 real economic and financial transactions were executed safely and efficiently by the overseen systems. In respect of these systems (the VIBER, the ICS and the securities clearing and settlement system operated by KELER and KELER CCP) (Table 2), the improvement in transaction execution time between participants and between customers exceeded expectations. The turnover of the payment systems and securities clearing and settlement systems increased slightly in value relative to the previous year. There was ample liquidity both at the system level and at individual bank level. Risks in the overseen systems (risk of service continuity, clearing and settlement risk, system operational interdependency risks)⁶ have not increased since last year.

2.2.1 CHANGES IN THE TURNOVER OF PAYMENT AND SECURITIES SETTLEMENT SYSTEMS

In 2013 the turnover of payment systems and securities settlement systems increased slightly in value relative to

the previous year. On the whole, GDP-proportionate annual turnover amounted to 55.27 times the amount of annual GDP (Table 3).

Turnover in VIBER did not change significantly in 2013, as the value of turnover increased slightly, while the number of transactions decreased compared to the previous year. The value of VIBER's turnover increased only marginally in 2013 (by 0.36 per cent), mainly due to the increase in the settlement orders⁷ submitted by GIRO and KELER. The volume of transactions dropped by 8.9 per cent compared to the previous year, owing to a decline in customer transactions. This is partly due to the changed transaction initiation behaviour, as some of the VIBER transactions were re-channelled to ICS intraday clearing.⁸

In 2013 the number of ICS transactions rose by 3.3 per cent, while the value of turnover increased by almost 10 per cent.

The increase in turnover value was largely due to intraday clearing, as many large-value transactions are cleared through

Table 2
Typical payments performed by the systems overseen by the MNB

Overseen systems		Typical transactions
VIBER		– bank-to-bank items: financial market transactions (i.e. HUF leg of HUF FX transactions, HUF cash leg of securities transactions) – settlement of the ICS intraday clearing cycles – central bank operations (e.g. cash and monetary policy operations) – customer transactions: large value urgent corporate or household payments
ICS	overnight clearing	– paper based credit transfers (i.e. salary or pension payments) – direct debits (i.e. bill payments) – transactions of the State Treasury
	intraday clearing	– retail payments: electronic credit transfers submitted by clients
KELER		– clearing and settlement of (1) regulated market transactions not guaranteed by KELER CCP; (2) OTC transactions; and (3) international transactions. – settlement of regulated market transactions guaranteed by KELER CCP Settlement includes the delivery and payment of financial instrument related to the transactions
KELER CCP		– clearing of regulated market (guaranteed) transactions including derivative transactions Calculation of margining and collateral requirements

⁶ See Box 5 in the publication *Report on Payment Systems, 2012*.

⁷ Securities transactions settled on a DVP (delivery versus payment) basis and the intraday clearing of ICS are settled in the VIBER according to the settlement orders submitted by market infrastructures.

⁸ See Chapter 4.1 for more details.

Table 3
Turnover and main figures of the payment and securities settlement systems

Overseen systems	Volume (thousands)		Value (HUF thousand billion)		Turnover/GDP		Settlement agent	Clearing house	Central securities depository	Central counterparty	Participants	
	2012	2013	2012	2013	2012	2013					direct participant	indirect participant
VIBER	1556	1417	1242	1287	44	44.1	MNB	MNB	–	–	45	132
ICS	overnight clearing	178,384	158,288	36.7	16	1.3	MNB	GIRO	–	–	39	130
	intraday clearing	76,500	155,326	28.4	59	1						
KELER/ KELER CCP	646	699	263.3	266	9.3	9.1	credit institution: MNB, brokers: KELER	KELER KELER CCP*	KELER	KELER CCP	132 81**	✓

■ = Operator

✓ = There are indirect participants, however their number is not available

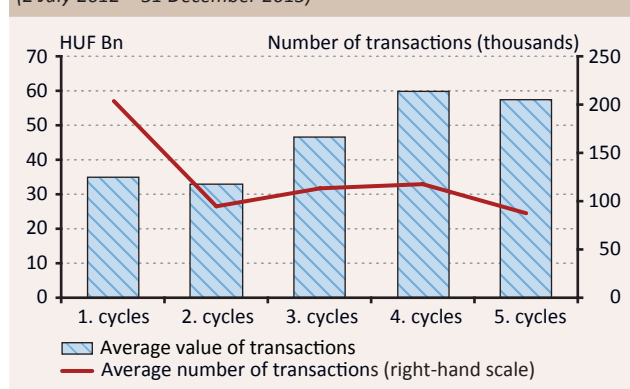
* = KELER transferred the clearing function of guaranteed markets to KELER CCP from 1 January 2013

** = *From this 31 clearing member participated in the capital market and 50 clearing member participated in the energy market (electricity and gas).

this system instead of VIBER. In intraday clearing, the bulk of the turnover value is concentrated in the last two cycles, while the number of transactions reaches its peak during the first cycle (Chart 4). The primary reason for this is the fact that small value household items received by banks after the closure of the previous day's intraday clearing are handled at the beginning of the day, while large value corporate transactions are typically executed in the last two cycles. In relation to changes in clearing turnover, it should be noted that the number of transactions rejected due to insufficient

KELER Zrt, as a central securities depository, recorded 699,000 transactions for 2013, reflecting 8.1 per cent growth over the previous year. This increase can be mainly attributed to Free of Payment transactions and securities origination. The number of transactions settled by KELER CCP rose by 4 per cent in 2013. The increase in the number of securities transactions was more moderate, amounting to 1.1 per cent compared to the previous year. This can be explained primarily by the fact that, other than transactions settled by the central counterparty and OTC spot transactions, the value of all transactions increased slightly.

Chart 4
Changes in the turnover of ICS intraday clearing by cycle
(2 July 2012 – 31 December 2013)



funds within direct debit transactions used typically for the payment of households' utility bills and regular service charges decreased by 15 per cent compared to the previous year.

Compared to the previous year, transactions settled and cleared by the securities market infrastructure increased both in terms of value and in terms of transaction number.

2.2.2 TRANSACTION EXECUTION TIME BETWEEN SYSTEM PARTICIPANTS AND BETWEEN CUSTOMERS

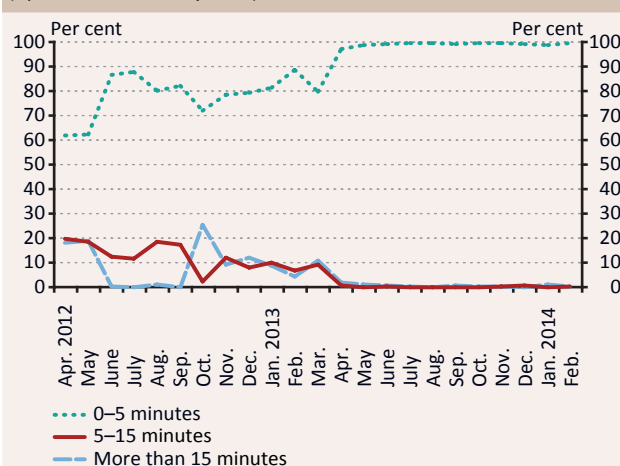
For the predictability of transaction execution, participants of the payment systems and their clients wish to know how long it takes for the payment transaction initiated by them to be credited to their partner or beneficiary account. Therefore, the execution time of transactions during the clearing and settlement process in the systems must be monitored and, based on the results, it is possible to estimate the length of the expected execution time between customers. In the payment systems, transactions are settled in VIBER in all cases; the transaction can only be credited to the payee's account by the payee's bank once this settlement takes place. Accordingly, one important element of the execution time for payment orders is how fast VIBER processes and settles the transactions submitted by participating banks, the ICS, KELER or the card settlement systems, and informs the participants of the result.

Starting from the second half of 2013, interbank transactions and transactions between customers are settled in VIBER faster than before, within 1 minute on average (Chart 5).

VIBER is a real-time system, which means that, in the case of sufficient funds, it settles the transaction immediately. The MNB has measured the execution time of VIBER transactions since April 2012, based on which the time requirement for the execution of transactions can be determined precisely. VIBER transactions move between the ordering bank, VIBER and the beneficiary bank via the network of SWIFT. The execution time of VIBER transactions – i.e. the time elapsed between the acceptance of the payment order by VIBER and the sending out of the message on settlement – is measured on the basis of the time stamps of SWIFT transactions.⁹ The measurement is valid for bank-to-bank and customer transactions and covers 75–80 per cent of VIBER transactions. Based on the data, 99 per cent of all transactions covered are settled within 5 minutes. The improvement in transaction execution time observed since April 2013 is due to the fact that the customer transactions of one of the participants which had caused significant congestion in morning processing were re-channelled to the ICS. The extended band width of VIBER and the expansion of batch sizes in early 2013 also contributed to the improvement.

Chart 5
Execution time of bank-to-bank and customer transactions in VIBER

(April 2012 – February 2014)



Transactions settled in VIBER can be executed between customers in a matter of minutes and the maximum execution time is now close to 2 hours. Most VIBER participants signed the interbank agreement which requires them to forward to VIBER, within two hours, all payment orders submitted by their

clients for processing in VIBER.¹⁰ Pursuant to legal regulation, funds must be credited to the client's account immediately after the crediting of the participating bank's account in VIBER; therefore, after it has been settled in VIBER, the amount transferred can appear on the beneficiary customer's account in a matter of minutes. This depends on when the bank can complete the immediately initiated crediting of the transaction to its client's account.

The amount transferred through ICS intraday clearing is credited to the beneficiary's account within two hours on average instead of the legally required four hours. The average duration of clearing and settlement is 10 minutes per intraday clearing cycle. This includes the time elapsed between the closure of transaction receipt for the given settlement cycle and settlement in VIBER. The processing time depends on the number of items settled in the cycle in question, but in 2013 processing did not exceed 15 minutes even during the cycle with the largest number of transactions. Pursuant to the rule defining the execution deadline of electronically submitted payment orders,¹¹ the maximum time between the debiting of the account of the payer and the crediting of the account of the payee's payment service provider may not exceed four hours. After the amount transferred has been credited to the account of the payment service provider, the payment service provider must credit the amount to the beneficiary's account immediately. According to the analysis of the turnover of direct ICS participants – which covered 92 per cent of ICS intraday clearing turnover – customers can expect an average 2-hour execution time during the five intraday clearing cycles of the ICS. This time may vary between cycles, but average execution times calculated for each clearing cycle varied between 1 hour and 40 minutes and 2 hours and 50 minutes. This means that in reality transactions between customers are cleared and settled within two hours on average instead of the four hours prescribed by legislation.

2.2.3 RISK DEVELOPMENTS IN OVERSEEN SYSTEMS

In overseen systems, the risk of service continuity, clearing and settlement risk, as well as system operational interdependency risk have not risen markedly since last year and continue to remain at a low level. The MNB continuously identifies, measures and monitors the functioning of the clearing and settlement systems in relation to these three risks. If necessary, it also makes proposals for risk mitigation and improving efficiency.

⁹ 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 the execution).

¹⁰ At the bank level, manual processing may occur more often when VIBER transactions are being sent to VIBER.

¹¹ Decree No. 18/2009 (VIII. 6.) MNB on Payment Services Activities.

2.2.3.1 Service continuity risk

In 2013 VIBER demonstrated a high degree of operational reliability, and the risk of service continuity decreased moderately. The monthly availability ratio of the core settlement service was below the internationally required 99.7 per cent level in only one month during 2013, as opposed to 2012, when two such instances were recorded (Chart 6). Compared with 2012, the average duration of individual incidents resulting in the outage of core settlement services also declined, while their aggregate duration remained unchanged.¹² In 2013 overall settlement unavailability time in VIBER was shorter than in previous years. In an additional four instances, while the settlement of transactions by VIBER participants did take place, modification of the intraday credit line or cash deposit transactions could not be completed. Besides the duration, the severity of core settlement service outage also significantly depends on the actual time of system disruption within VIBER business hours.¹³ In 2013, incidents resulting in the outage of the core settlement service did not prevent the completion of ICS intraday clearing cycles, even though there were two cases where intraday credit lines could not be modified during the ICS settlement period. Nevertheless, none of these instances led to participants experiencing liquidity issues.

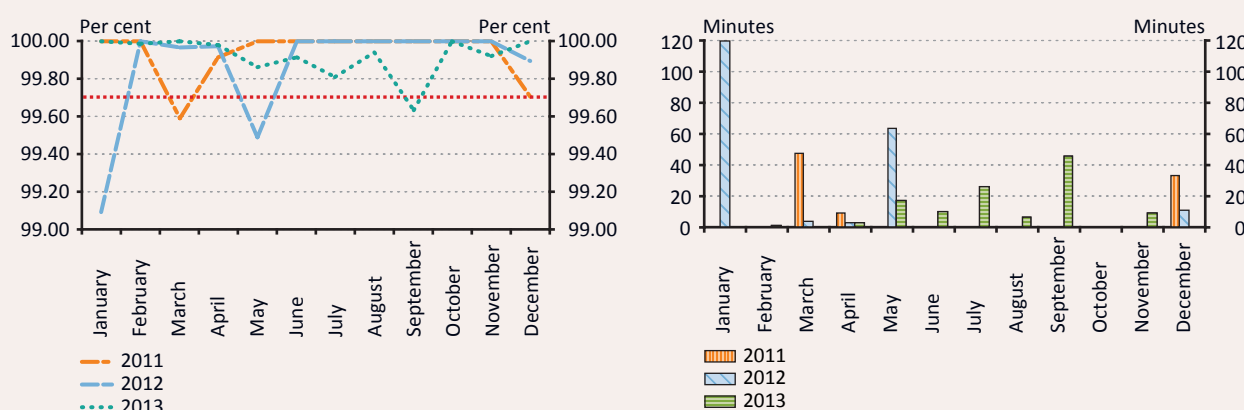
In ICS, both overnight and intraday clearing platforms functioned reliably. The risk of service continuity in overnight

clearing remained low in 2013. GIRO, the operator of ICS, was able to observe the time limits specified in its Business Rules on each settlement day,¹⁴ having particular regard to the completion times of sending and settlement phases. Intraday clearing – despite being subject to a tighter time frame as opposed to overnight clearing – processes the transactions efficiently and quickly. While several incidents leading to reduced availability of the intraday clearing system occurred in 2013, GIRO was able to rapidly recover operations on each occasion (Chart 7).

In 2013 the key securities clearing and settlement services generally demonstrated a high level of operational reliability, with availability rates indicating that the risk of service continuity remained unchanged since the previous year. In the context of these services, outage of the core settlement service means the duration of an incident affecting clients. Service outage only involving internal processes – which clients only perceive as a slowdown, rather than actual downtime – is referred to as reduced service level. In the securities clearing and settlement system, there were a total of 13 system disruptions lasting for more than 10 minutes each in 2013, with three of these causing an outage of the core settlement service. Compared to 2012, even though the number of incidents rose, the duration of outage affecting clients declined. Consequently, operational risks remained virtually unchanged compared to 2012 (Chart 8).

Chart 6
Monthly availability ratio of the core settlement service in VIBER (left chart) and aggregate duration of outages of the core settlement service in minutes (right chart)

(2011-2013)



¹² The aggregate duration of incidents leading to core settlement service outages dropped by 4 minutes in 2013. The time between the start and end (recovery) of incidents has been reduced since 2012, with the longest downtime lasting 46 minutes compared to 95 minutes in 2012.

¹³ Of particular importance is the settlement period of the five intraday clearing cycles in ICS, as well as the period between 4:00 and 6:00 PM. While 70 to 85 per cent of intraday transactions are settled by 2:00 PM, availability becomes particularly important after 4:00 PM – especially after the last ICS intraday clearing cycle and following the closing of customer transactions at 5:00 PM – due to participants adjusting their own end-of-day liquidity positions.

¹⁴ Pursuant to the Business Rules of the ICS, the deadline for sending out the results of the first phase is 11:00 PM, for the second phase, 6:00 AM and for the extraordinary phase, 12:00 AM.

Chart 7
Availability of ICS overnight and intraday clearing
(2012-2013)

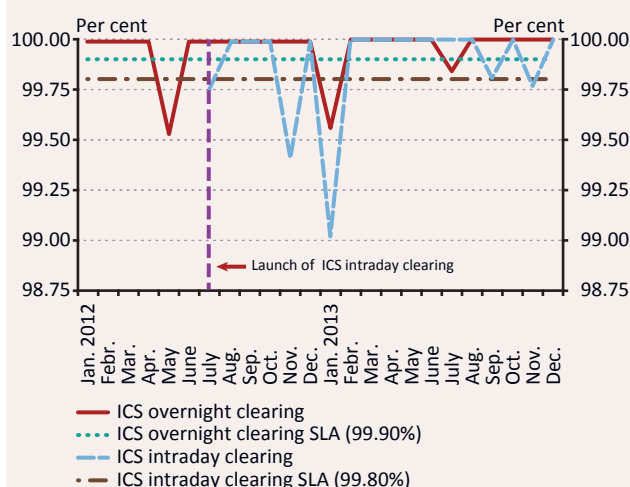
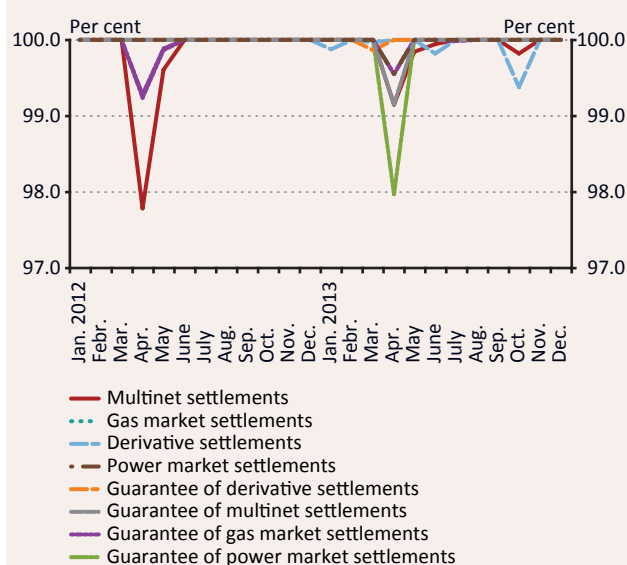


Chart 8
Availability of the key services of the securities clearing and settlement system
(2012-2013)



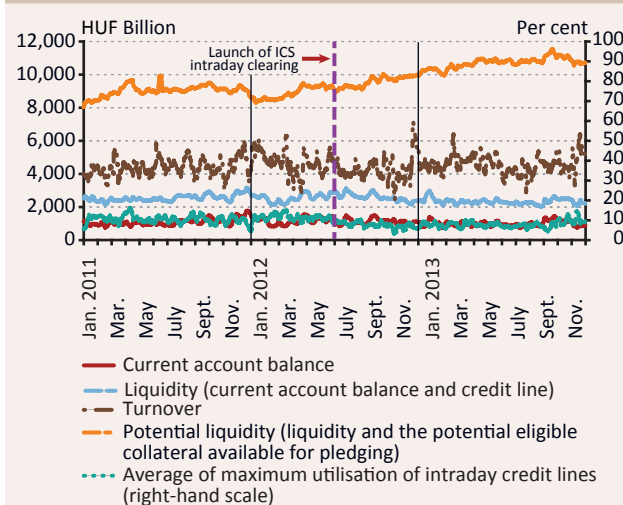
2.2.3.2 Clearing and settlement risk

From a liquidity standpoint, 2013 was an unremarkable year for both VIBER and ICS. At both the systemic and individual bank level, liquidity remained abundant, and, compared to the previous year, significant changes took place neither in current account balances nor in the utilisation of credit lines (Chart 9).

The current account balances of participants constitute one of the components of liquidity in payment systems. Under the reserve requirement regime, credit institutions are required to maintain a balance (funds) of their current accounts held with the MNB, which is fully available for payment transactions. As a general rule for VIBER participants, credit institutions with a high turnover relative to their total assets tend to opt for a 5 per cent reserve requirement ratio in the flexible reserve requirement ratio regime. This is because a relatively higher current account balance facilitates liquidity management. Major participants did not modify their reserve ratios during the year. The abundance of liquidity was well illustrated by the fact that, at the systemic level, the maximum usage of the other component of liquidity – intraday credit lines (MICL)¹⁵ – remained at the extremely low rate of 14 per cent in 2013 (Chart 9). At the individual level, however, the MICL figures are widely distributed. Some participants regularly had MICL values exceeding 90 per cent. This, however, does not represent a liquidity risk as individual institutions' balance sheets continued to have sufficient eligible securities available for pledging, through which intraday credit lines could have been increased. During the year, the tight liquidity position of participants improved, and the frequency of MICL exceeding 90 per cent declined by 31 per cent relative to 2012.¹⁶

Since its introduction, the first complete calendar year of intraday clearing did not result in tighter liquidity at systemic level. Intraday clearing turnover varied between

Chart 9
Turnover, current account balance, actual and potential liquidity of VIBER participants, and maximum utilisation of intraday credit lines (MICL) in the system
(2011-2013)



¹⁵ Credit line utilisation quantifies the bank's rate of utilisation of its available credit line, whereby its negative account balance is compared to the available credit line.

¹⁶ In 2013, there were a total of 326 instances where the MICL rose above 90 per cent.

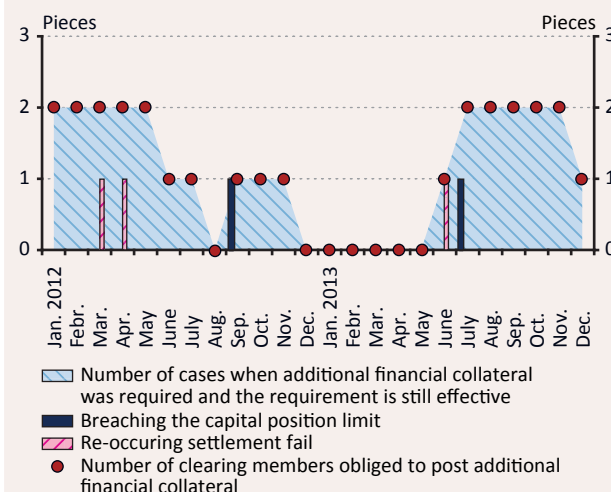
individual cycles, but on aggregate, the transactions arising from intraday clearing only amounted to an average of 4 per cent of the liquidity available at any given moment in the system. Only in the last months of the year, which traditionally have higher turnover rates, as well as on tax return due dates, was an increase in liquidity demand for the settlement of ICS transactions noticeable. On these occasions, this ratio rose as high as 15 per cent of total liquidity.

During 2013 there was one credit risk event in the securities clearing and settlement system that called for the mobilisation of collateral. This, however, left collective guarantee elements – including KELER CCP's dedicated own resources and its guarantee callable on first demand – unaffected.¹⁷ The credit risk event occurred due to human error. A clearing member failed to make payment for the transactions concluded, and therefore, in accordance with KELER CCP's General Business Regulations, the member's individual collateral was mobilised to cover the payment obligation. The applicable payment was granted the next morning. In the securities clearing and settlement system, financing risk originates mainly from the central counterparty function, because KELER CCP as the central counterparty guarantees the settlement of transactions if the counterparties to the transaction fail to fulfil their obligations. Consequently, the role of the central counterparty becomes significant if a credit risk event occurs, since that is when additional elements of the guarantee system operated by KELER CCP (such as collective collateral, own assets) may be activated.

In 2013 no clearing and settlement risk emerged in the securities clearing and settlement system due to insolvency by capital market participants. In guaranteed capital markets, there are several lines of defence for managing the clearing and settlement risks stemming from the insolvency of a clearing member. In extreme cases, the clearing right of the affected clearing member may be suspended, while in less extreme cases it may be ordered to provide additional financial collateral. In 2013 there were no instances of additional financial collateral being imposed in the capital markets due to non-compliance by clearing members with applicable capital requirements. In the past two years, additional financial collateral was not required due to a breach of market position limits, whereas a breach of capital position limits led to such measures on two occasions involving the same clearing member. In 2013 the frequency of settlement fails showed a notable decline compared to the previous year, but the aggregate value continued to increase. For the purposes of mitigating increased risks, KELER CCP imposed additional financial collateral requirements on one clearing member due

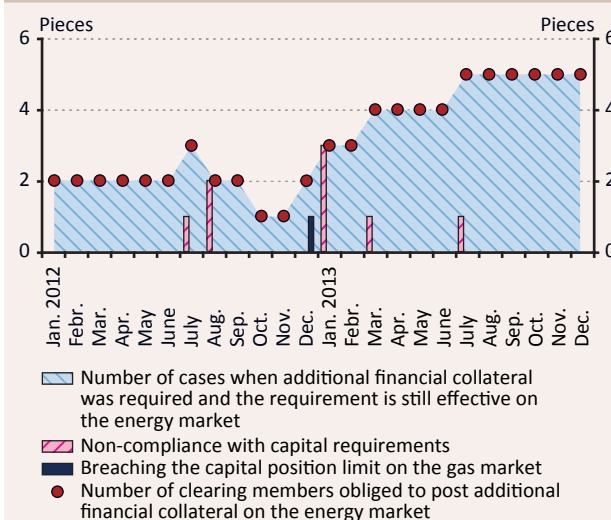
to repeated settlement fails in the cash market. The required additional financial collateral was provided in each case (Chart 10).

Chart 10
Additional financial collateral required by KELER CCP in guaranteed capital markets
(2012-2013)



In energy markets, clearing and settlement risks moved on an upward trend in 2013. As in the case of guaranteed capital markets, the central counterparty is entitled to impose additional financial collateral requirements or suspend clearing memberships in energy markets as well. In 2013 the

Chart 11
Additional financial collateral required by KELER CCP in guaranteed energy markets
(2012-2013)



¹⁷ In 2012, no credit risk events occurred and no collateral was mobilised.

requirement of additional financial collateral due to non-compliance with capital requirements was imposed on a total of five members, three of which were power market sub-clearing members and two of which were gas market clearing members (Chart 11).

For liquidity-related current issues in clearing and settlement systems, see Chapter 4.

2.2.3.3 System Operational Interdependency Risk

In 2013 inter system operational interdependency risk remained at a low level for all three overseen systems compared to the previous year, due to their robust operation. Assessing system operational interdependence risks is important because fundamental liquidity-related interdependencies between payment systems may give rise to contagion; oversight monitoring is therefore indispensable in this regard. System operational interdependency risk typically

arises between institutionally separate clearing and settlement service providers, although it may also occur within a single institution due to the integration of clearing and settlement functions. In the ICS, there was only one occasion when the MNB caused a GIRO incident, by sending out an erroneous Routing Table.¹⁸ Due to the incident, the first intraday clearing cycle was completed beyond the maximum deadline originally specified. Settlement of intraday clearing suffered no delay due to any MNB or KELER incidents. In 2013 a modest increase of operational interdependency risk was observed in VIBER to be originating from the ICS, compared to the previous year. GIRO requested one-hour extensions of the bank-to-bank operating hours on a total of five occasions during 2013, once due to technical problem within its own system and four times at the request of ICS participants. System operational interdependency risk did not emerge in VIBER due to KELER's technical issues. In the securities clearing and settlement system, operational interdependency risks remained at a negligible level in 2013.

¹⁸ The Routing Table contains the data of participants in payment systems.

2.3 Findings from payment inspections

Compared to previous years, 2013 saw a record number of payment inspections carried out by the MNB. Compliance with the provisions of the MNB Decree on the execution of payment transactions¹⁹ was inspected at 19 credit institutions: 18 of these were scheduled and one was an unscheduled inspection (Table 4). Findings from the on-site inspections conducted during 2013 indicate that, while compliance was generally observed at the credit institutions inspected, in certain cases grave violations were also revealed.

Following the inspections, the MNB imposed a total of 107 tasks and 6 fines in its resolutions issued to remedy the deficiencies identified and to conclude the inspections. In most cases, non-compliance typically involved delayed crediting and the use of the inappropriate value dates (Chart 12). In consideration of the gravity, nature, magnitude and business impacts of the deficiencies identified, fines amounting to a total of HUF 23.6 million were issued to six credit institutions last year, one of which failed to meet its obligations on time, prompting the MNB to impose an additional HUF 400,000 in sanctions. Findings from payment inspections contribute to improving financial consumer protection and

enhancing payment efficiency, as well as to the development of payment regulation.

Chart 12
Types of non-compliance cases in payments at inspected credit institutions
(2010-2013)

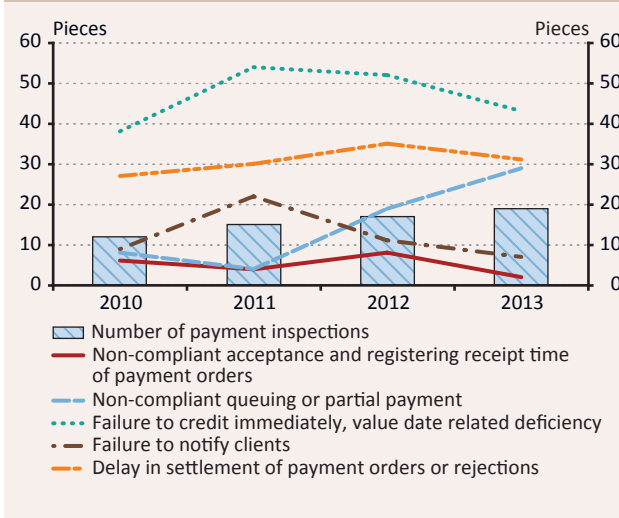


Table 4
The MNB's payment inspection activity in numbers
(2010-2013)

		2010	2011	2012	2013
Number of payment inspections	Bank	8	9	8	11
	Cooperative credit institution	4	6	9	8
Number of findings*		113	134	125	118
Number of measures*		67	78	113	107
Number of fines	Bank	2	2	—	2
	Cooperative credit institution	2	5	4	4
	Total:	4	7	4	6
Amount of fines (in million HUF)	Bank	14	17	—	3.2
	Cooperative credit institution	1	4.4	3.2	20.4
	Total:	15	21.4	3.2	23.6

*The row 'Number of Findings' refers to deficiencies described in the inspection reports; whereas the 'Number of Measures' indicate actions prescribed for addressing these deficiencies.

¹⁹ MNB Decree No. 18/2009 (VIII. 6.) on the execution of payment transactions

As a result of the integration of supervisory functions into the MNB, the spectrum of inspections broadened and more stringent sanctioning policies became available, thereby improving the efficiency of payment inspections even further.

The integration of supervisory functions provides for the oversight of payments legislation at a high level of standards. In October 2013 the Bank's range of activities in payment inspections was expanded to add monitoring compliance with the provisions of the Payment Services Act.²⁰ Previously, the MNB's scope of authority in payment inspections only entailed monitoring compliance with the MNB Decree, in parallel with which the Hungarian Financial Supervisory Authority was in charge of payment legislation. Before integration, overlaps

between the two institutions' inspection activities were unavoidable. As a major impact of the integration of payment inspections, the supervision of the European Union's Directive on payment services in the internal market²¹ is now assigned to a single competence centre. As a result of the integration, the methodology used by the MNB in its payment inspections to determine fine amounts has been revised, with the hopes that these amounts can better act as deterrents themselves, thereby encouraging compliance among market participants. Taken together, these measures could provide for a more effective enforcement of payment legislation, which in turn might also strengthen clients' confidence in the financial sector.

²⁰ Act LXXXV of 2009 on the Provision of Payment Services.

²¹ Directive 2007/64/EC on payment services in the internal market.

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

Adoption of the Payment Accounts Directive may help consumers receive better and comprehensive information, while also reinforcing competition between payment service providers. Moreover, the regulation may also pave the way for the introduction of basic accounts that can contribute effectively to the process of financial convergence. In May 2013 the European Commission proposed a draft Directive on payment accounts, the finalised version of which was adopted by the European Parliament on 15 April 2014. The Directive stipulates the instances and conditions under which payment service providers operating in EU Member States are required to ensure access to basic payment accounts. Thanks to the provisions on basic payment accounts, service packages offering low-cost access to payment accounts and allowing citizens to make a designated number of payments each month – adjusted to household payment habits – can become widely available. Basic accounts can contribute to financial inclusion by making payment services required for electronic transactions available, at low fees and without ancillary services, to citizens who, under current market conditions, are unable to or not interested in opening accounts. The Directive establishes rules as regards the comparability of fees linked to payment accounts, as well as the conditions and underlying process of switching between accounts. As a result of the rules of the Directive, clients of payment service providers will be able to obtain more transparent and consolidated information on applicable service fees and charges, and websites operated independently from service providers will allow consumers to easily compare conditions for payment accounts offered on the market. The rules on payment account switching make it easier for consumers to switch between payment service providers, by requiring the affected service providers to cooperate on a number of issues to ensure a smooth transition. In order to ensure that the Directive can sufficiently facilitate the development of payments in Hungary, it must be transposed into national law with due care.

Following the regulation on interchange fees that went into effect in 2014, interchange fees on card payments have been significantly reduced in Hungary. The underlying reasons and the background of the regulation jointly initiated by the MNB

and the Hungarian Competition Authority are presented in detail in the 2013 publication *Report on Payment Systems*. Under the regulation, interchange fees charged on domestic card payments shall not exceed 0.2 per cent of the overall purchase amount for debit cards and 0.3 per cent for credit cards. These limits are in line with commitments on the fee rate applicable to cross-border transactions by the two largest card companies present in Hungary, in accordance with the European Commission's competition proceedings. As a result of the regulation, acceptance-related fees payable by merchants are being decreased; meanwhile unambiguous provisions allow for long-term predictability and thus facilitate the growth of Hungary's payment card market. Furthermore, the regulation creates level playing field for the two major card companies, which in turn can boost competition between them. By regulating interchange fees at European level and rewriting the business rules of the European card market, the European Commission's proposed regulation may further improve the efficiency of payment card systems, which could have positive impacts on the Hungarian payment market as well. Thanks to the draft regulation published by the European Commission in July 2013, it will be possible to establish harmonised rules on interchange fees at the European level, which, according to the plans, will be in line with the fee caps that are currently in place in Hungary. In addition, the business rules on the operation of card systems are also likely to undergo several modifications in the future, enabling the many participants in the card market to compete with one another under transparent rules and on equal terms. The planned regulation facilitates competition both at the level of service providers and card products, and promotes the creation of a single EU card market.

With the review of EU regulation on payment services, it will be possible to establish a Directive supporting the development of the European payment market and aligned to recent developments in technology and changes in markets. On 24 July 2013 the European Commission published on its website a proposal for the revised Payments Services Directive (PSD2) on payment services in the internal market. Above all, the PSD2 would introduce significant changes in terms of scope, as the regulation would extend to third-party service

providers offering, as a new category of service providers, payment initiation services and account information services as well. Furthermore, the scope of application of most liability and allocation of losses rules would be extended to one-legged payment transactions,²² as well as to payment transactions in non-EEA currencies. Nevertheless, the PSD2 does not allow Member States to exercise discretion as to the application of surcharges by the payee to the payer. Under the proposal regulation, such surcharging is generally permitted; however, any charges applied shall not exceed the costs borne by the payee for the use of the specific payment instrument – the only exception being transactions initiated in card systems where interchange fees are regulated by way of Regulation.

The European Commission has set the objective of harmonising regulation on trading and post-trading infrastructure. The legislative package comprises three parts: a review of the MiFID Regulation that regulates the trading infrastructure (MiFID II and MiFIR) as well as codification of two new Regulations – EMIR²³ and CSDR²⁴ – that will provide an operational framework for the post-trading infrastructure. Following adoption by the European Parliament, the European Market Infrastructure Regulation (EMIR) on Central Counterparties and related technical standards were published in 2013.²⁵ February 2014 marked the approval of the draft Regulation on Central Securities Depositories (CSDR), with its announcement scheduled for the second quarter of 2014 and publication of pertaining Level 2 Technical Standards expected at the end of the year. The CSDR will stipulate the operational conditions of central depositories and applicable terms of

access, the clearing and settlement cycles and the various matters relating to securities issuance. As a key rule, the CSDR prohibits central securities depositories from providing any banking type of ancillary services.²⁶ However, in countries²⁷ whose central securities depositories are still entitled to provide limited banking services, this may be permitted in connection with their core services.

On the basis of the regulatory efforts aimed at deepening the integration of financial markets and enhancing competitiveness and efficiency, in October 2011 the European Commission put forth a review proposal for the Directive on Markets in Financial Instruments²⁸ (MiFID) and related regulations. The proposal called for the establishment of a new regulation (MiFIR) and a revision of the 2004 Directive. The European Parliament approved the final text on 15 April 2014. The MiFID II reform means that organised trading of financial instruments should shift to regulated trading platforms and strict transparency rules ensure that trading practices undermining fair price formation will no longer be allowed. With the introduction of a trading obligation for derivative contracts and by limiting commodity derivative positions, derivatives markets can be made safer and more efficient; meanwhile non-discriminatory access to central counterparties, trading venues and benchmarks is expected to drive efficiency-increasing competition within the European Union. Furthermore, MiFID II reinforces investor protection and ensures that changes in trading arising from technological progress do not jeopardise the functioning of markets, while also providing for a consistent application of sanctions for infringements.

²² One-legged transfers refer to payment transactions to third countries, where only one of the payment service providers is located within the European Union. Provisions of the PSD2 would apply to the parts of these payment transactions which are carried out in the European Union.

²³ Regulation 648/2012/EU on OTC derivatives, central counterparties and trade repositories.

²⁴ The European Parliament and the Council adopted the draft Regulation on settlement and Central Securities Depositories (CSDR) in the first quarter of 2014, with its publication expected during the second quarter of the year.

²⁵ For the regulation's impacts on the Hungarian securities clearing and settlement systems, refer to Section 2.5.

²⁶ Settlement of the cash leg of securities transactions.

²⁷ Austria, Belgium, Germany, Hungary and Luxembourg.

²⁸ Directive 2004/39/EC on Markets in Financial Instruments.

2.5 Organisational and structural transformation of the KELER Group

The organisational and structural transformation of KELER Group, the operator of the securities clearing and settlement infrastructure, took place during 2013, in accordance with the latest European regulations (EMIR). However, full transformation is not yet complete, as compliance with CSDR provisions may require additional organisational reforms. KELER CCP fulfils the capital requirements set forth in the EMIR, which stipulates that risks must be managed by the institution in which they actually arise. Depending on the degree of risks assumed, EMIR specifies capital requirements for the central counterparty, at a minimum of EUR 7.5 million. In order to comply with this provision, the owners of KELER CCP decided on a risk-proportionate recapitalisation in the amount of HUF 4 billion and opted for the phasing out of the callable guarantee model.²⁹ At the end of 2013 KELER CCP held a total of HUF 4.583 billion in available funds.³⁰

In line with EMIR provisions, the risk management model used by KELER CCP has also been reformed.³¹ Based on the stress tests completed during 2013 in the market subject to the EMIR, guarantee funds would have continued to provide sufficient coverage for any exposure arising, under extreme yet plausible conditions. The EMIR specifies a stringent stress testing methodology for determining the lines of defence provided by guarantee funds. As a new service, segregation of dedicated securities accounts is now available at the individual client level, as is the transfer of positions and collateral assets between clearing members.³² At KELER CCP, mechanisms for the continuous monitoring of liquidity risk have been established, as has the methodology for back tests, sensitivity analyses and reverse stress tests. Risks inherent to ordinary market fluctuations are managed by KELER CCP through individual clearing member collateral (e.g. initial margin, variation margin), whereas various financial assets

(e.g. collective guarantee funds, own resources) are employed to mitigate risks arising from extreme, but plausible market scenarios.

The provisions of EMIR only mitigate the effects of spillover risk between the central counterparty's services for capital and energy markets, without eliminating the risk completely. Besides its services for capital markets, since July 2010 KELER CCP has also been in charge of clearing and guaranteeing transactions on the gas and power markets (together 'energy markets'). As energy markets continue to expand (also across borders) they open up a new market segment for KELER CCP; however, none of these markets can be regarded as risk free. With energy market turnover on the rise and in view of the consequences of the EMFESZ case,³³ it has become an oversight requirement to ensure the legal separation of energy market risks from those applicable to the capital market, thereby preventing a possible credit exposure arising on the energy markets from also exhausting guarantee elements available for the capital market. While the EMIR does reduce the probability of spillover risk between services on the capital and energy markets to a notable degree, it does not eliminate it completely. The last guaranteed lines of defence, KELER CCP's additional guarantee capital – and, until 31 May 2014, KELER's guarantee callable on first demand – are set at an equal level for both markets. From an oversight standpoint, the separation of central counterparty operations into capital market and energy market functions would represent the only risk-free solution, but that mostly falls into owner competence.

Under the European Market Infrastructure Regulation (EMIR), all central counterparties operating within the European Union – thus including KELER CCP – must have their licenses renewed. On 13 September 2013 KELER CCP submitted its

²⁹ Under the callable guarantee model, KELER, as the majority owner of KELER CCP, uses its own funds to provide financial collateral, to the extent determined by its General Meeting, in case KELER CCP's own funds were at risk of being depleted due to a credit risk event.

³⁰ Available funds comprise the following elements: minimum required capital (HUF 2.480 billion), dedicated own resources (allocated to guarantee fund markets of KELER CCP, amounting to HUF 564 million), other financial resources (HUF 1.539 billion).

³¹ This affects the default waterfall, the stress tests used, the margin requirements and the calculations used to determine the guarantee fund.

³² In the event that a clearing member is subject to insolvency or bankruptcy proceedings, those of its clients that have resorted to the service of position transfer may be entitled to having their positions and related collaterals transferred to another clearing member with virtually immediate effect. As a precondition, parties must conclude a relevant agreement in advance, which must be submitted to the central counterparty.

³³ See Box 8 in the publication *Report on Payment Systems, 2012*.

application for authorisation to the competent supervisory authority, which is required to evaluate said application within six months of the application being declared complete. However, decisions are ultimately made not by the regionally competent supervisory authority but a college that is in charge of the authorisation and supervision of central counterparties. Similarly to other central counterparties in Europe, KELER CCP's

Supervisory College has also been established, with the central bank of Hungary, the Financial Services and Markets Authority of Belgium, the central bank of Ireland, the Financial Conduct Authority of the United Kingdom and the European Securities Markets Authority (ESMA) as its members. The re-authorisation procedure of KELER CCP is scheduled to complete in the third quarter of 2014 at the latest.

2.6 The last key actor in the payment and clearing infrastructure has been brought under national ownership

After its launch of its own-operated VIBER in 1999 and the 2004 acquisition of a majority stake in the KELER Group (KELER and KELER CCP) that operates the securities clearing and settlement system, the MNB has now purchased from the banking sector GIRO, the operator of Hungary's Interbank Clearing System. Up until April 2014, GIRO had a total of 21 banks and the MNB among its owners, with the latter possessing an 8.09 per cent share and the top five shareholders controlling 78.12 per cent. In February 2014, the MNB submitted an offer to said shareholders for the purchase of GIRO, a monopolistic financial service provider primarily engaged in the processing of credit transfers and direct debits in the retail and corporate segments. Consequently, the MNB's stake rose to 86.21 per cent in the first round. Thereafter, smaller shareholders of GIRO received a similar offer at the same price, which they all accepted. As a result, the MNB acquired a 100 per cent stake in the company together with BISZ Zrt., a subsidiary wholly owned by GIRO. The acquisition took place at an overall sale price of HUF 9.5 billion, which the MNB determined based on a business assessment by an internationally recognised, independent financial advisory firm.

The acquisition was driven largely by the Bank's three aims: to facilitate the lowering of charges payable by clients, to enhance the efficiency of developments in the payment system, as well as to keep fundamental financial infrastructures in national ownership. The MNB is working vigorously to provide bank clients with the possible cheapest access to payment services, the rates of which have until now been kept at higher levels due to the profit-oriented business model of the clearing house. Each of the company's 21 bank owners had high profit expectations for GIRO, which is well illustrated by the fact that, despite the crisis that recently plagued the banking sector, GIRO has been able to deliver a steady return on equity in excess of 20 per cent, with shareholders enjoying a 95 per cent dividend payout ratio. This model primarily benefited major shareholders; meanwhile smaller owners with higher turnover rates, as well as the Hungarian State Treasury, were worse off than if charges

had been lower in the first place. And while the situation did improve somewhat after the redistribution mechanism³⁴ was launched in 2006 upon the MNB's initiative, a permanent solution was lacking. So long as private property-induced expectations of profit exist, they must be met – and that leads to fees being fixed at a certain level. If, however, there would be no such profit expectations, charges could be lowered. The MNB's plans include cutting back on profit expectations from GIRO and devising a minimal profit scheme that is sufficient to sustain stable operations, which will lead to fee reductions. Furthermore, the MNB will monitor whether banks will pass on the benefit of these fee cuts to their clients. Another important reason behind the MNB's decision is to ensure more efficient implementation of developments in the payment system. Looking at the developments that took place over the past 10 to 15 years, one can conclude that only those that received significant backing by the MNB have actually been brought to completion. It was upon the MNB's recommendation that the direct debit scheme became available; it was the MNB that set up VIBER and assisted in the establishment of GIRO and KELER, and, as the most recent achievement, intraday credit transfers via the ICS were also launched at the MNB's initiative. Given the networked structure of the payment market, none of these developments went smoothly: banks offering payment services were prone to hesitate. With its acquisition of GIRO, the MNB now has a much stronger control over developments in the ICS that mostly involve retail and corporate payments and are easier to implement without resorting to the most powerful regulatory tool. Finally, the third objective behind the acquisition can be derived from a national strategy that is aimed at bringing, where possible, utility-like companies offering basic services into national ownership. As regards financial services, VIBER, GIRO and the KELER Group are considered providers of basic services and enjoy monopolistic powers. This situation is not peculiar to Hungary alone, as these companies represent the types of infrastructures that do not necessarily need to exist in duplicate. There are several countries in Europe where the central bank owns a certain share in such systems.

³⁴ Under the redistribution mechanism, earnings above expected profits defined for the clearing activity are redistributed between participants in the system.

3 The pricing of payment services

3.1 Factors affecting the pricing of electronic payment methods and instruments

Due to the transformation of the financial services market, the role of financial institutions' revenues from payment services will rise in the future. The reason for this is that, while lending activity is curtailed and interest rates are low, continuous growth in revenues from payment charges and fees has been seen in Hungary's banking sector in recent years. In theory, the pricing of payment services is influenced by competition between payment service providers and the costs incurred in transactions and in the operation and enhancement of the infrastructure necessary for payment transactions. Since the pricing of payment services has a significant impact on clients' payment habits, it could also greatly affect both the rate and extent of the spread of electronic payment instruments. Obtaining a more thorough understanding of pricing and regularly analysing such can therefore help estimate the impacts of intended future developments and regulations on pricing. To that end, besides assessing the pricing mechanisms of financial services,³⁵ keeping continuous track of service prices is just as important. This allows for a better diagnosis of changes in the pricing or pricing structure of individual services or service packages, as well as those occurring in the fees charged to various client groups. Furthermore, by linking pricing information to the payment habits of affected clients, the estimated fee burden of individual client segments and the changes taking place therein can also be appropriately identified.

The complex and less transparent pricing of payment service packages typically used by households makes it very difficult to accurately assess the impacts of events related to the payment market; therefore, an extensive fee monitoring system must be set up. In general, the service packages offered by payment service providers include a number of payment services, as well as transactions at a reduced fee or

at no charge. Given the cross-pricing between services and the various types of discounts applied, the pricing of services becomes less transparent; therefore, valid conclusions cannot be drawn simply by looking at individual services on their own. In addition, an analysis of the pricing of payment services must also take into account the facts that service fees may vary significantly from one service provider to the other, and major differences may be possible both in terms of service features and pricing structure.

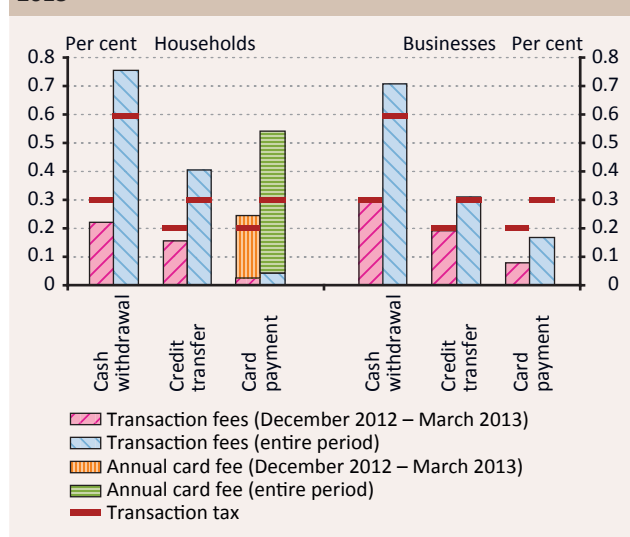
3.1.1 DEGREE OF PASS-THROUGH OF THE TRANSACTION TAX

Since the 2013 introduction of the financial transaction tax, the pricing of payment services has changed significantly. Hungary introduced a financial transaction tax in January 2013. There has been debate ever since regarding how and, most importantly, to what extent payment service providers pass on the tax to their clients. It is all the more difficult to answer the latter question because banks incorporated the tax into their payment fees only gradually (owing in part to the statutory 60-day term for disclosures) and because the rate of the tax also changed in the meantime. As of 1 August 2013, the tax on electronic transactions was raised from 0.2 per cent to 0.3 per cent and the tax on cash withdrawals from 0.3 per cent to 0.6 per cent, with the HUF 6000 per transaction cap also removed in the latter category.

Nevertheless, the timing and extent of fee increases show that by October 2013 all banks had, in one way or another, passed on the increase in costs stemming from the introduction of the transaction tax to their retail clients; moreover, in some instances the fee increase was higher than the rate of the tax itself. In the entire period under review (December 2012

³⁵ Éva Divéki – Henrietta Olasz (2012): 'A pénzforgalmi szolgáltatások árazása' [Pricing of payment services], *MNB Occasional Papers*, 101.

Chart 13
Changes in payment fees in the period from December 2012 to March 2013 and December 2012 to October 2013



through October 2013) changes in fees were significantly higher than warranted by the transaction tax.³⁶ The gap is wider in the retail segment than in the corporate segment, where banks tended not to raise their fees in excess of the transaction tax (Chart 13). Most banks passed on the tax applicable to card purchases by raising their fixed annual card fees, with only a few examples of fees proportional to transaction value. As this latter practice was more prevalent in the corporate segment, we did not examine the changes in fixed charges for this segment. While this might have a slight downward effect on the calculated pass-through, it is offset by the fact that transaction fees applicable to companies with a high volume of payment transactions are typically lower than those published in the terms and conditions, causing such companies to underestimate the true extent of the tax pass-through. It is important to emphasise that, from early 2013 onwards other factors may have also affected the changes in fees over the entire period under review, such as the regular annual inflation-indexed rise in fees, as well as the impacts of other events and government measures. In the period up to March 2013, the transaction tax on cash withdrawals and bank transfers was only partially passed on to retail clients, whereas card payment charges rose at a rate exceeding the tax. Over the same period, the tax was passed on almost entirely in the corporate segment.

After introduction of the transaction tax, banks' practices in passing it on to clients varied, with a number of institutions only implementing smaller fee hikes. However, once the rate was increased, a complete pass-through became standard practice at all banks. The data of individual banks demonstrate strongly diverging adaptation processes in the first phase of introduction of the tax and in the period following its raise. Analysis of the individual figures reveals that most banks passed on the transaction tax at a below-average rate in early 2013, with the sector average being pushed upwards by the extremely high fees of only a few banks. However, banking practices differed considerably as to the actual method and extent of pass-through applied, but there was less variation over the entire time horizon under review. In the second half of the year, banks typically adjusted their pass-through rates that were lower than the tax during the first phase, and their total fee increases were much closer to the actual extent of the tax. This means that banks which fully passed on the tax in the first half of the year raised their fees further to reflect the new tax rate, whereas providers that had only applied a partial pass-through of the transaction tax also passed on almost the entire tax, steeply raising their fees as the tax was increased.

3.1.2 CHANGES IN THE PAYMENT CHARGES OF RETAIL CLIENTS

Recently enacted regulations have had a considerable impact on the pricing of payment services and can therefore affect the use of electronic payment methods over the longer run. As a result of these regulations, the fees of payment services have drastically increased – a phenomenon that is only partially offset by the option of free cash withdrawals, available since February 2014. In its supervisory decision of March 2014, the MNB found the methods of fee hikes on payment services applied by a total of 35 payment service providers to violate the prevailing legislation. For their increases implemented in a non-compliant manner, affected market participants were ordered by the MNB to refund the relevant excess revenues to their clients. In the wake of the decision, the spring of 2014 brought additional reductions in the costs of payment service usage, meanwhile the refunded excess fee revenues can also lower the overall 2013 fee burden of clients using such services to below what otherwise would be payable according to the published terms and conditions. Inspections launched in connection with the fee and charge increases – which encompass the entire banking and savings co-operate sector – are expected to be concluded by the end of August.

³⁶ Our analysis did not extend to the consequences of the one-off supplementary transaction duty liability as stipulated under the 1 August 2013 amendment to the Act on Duties, nor did we look at the changes in monthly account management fees. For a detailed description of the methodology and results, refer to the *MNB Bulletin*, March 2014 (Tamás Ilyés – Kristóf Takács – Lóránt Varga: 'A pénzforgalmi szolgáltatások díjainak és a pénzforgalom szerkezetének alakulása a pénzügyi tranzakciós illeték bevezetését követően' (Changes in fees on payment services and the structure of payments following the introduction of the financial transaction tax)).

Box 1**A brief overview of the methodology of the fee monitoring system**

Payment costs that are discernible by retail clients essentially depend on two factors: the pricing of payment service providers and changes in household payment habits. Under the monitoring system, banks' publicly available lists of payment conditions are linked to payment statistics and to the results of household payment surveys. In this way, average payment costs can be determined for each payment instrument and transaction type. After aggregation of these costs, time series can be set up detailing the monthly average costs of payment paid by the average client based on payment habits. Assuming that such habits remain unchanged, the cost index can be used to generate an aggregate price index, which, once it is cleaned of increases in turnover, only shows the average change in bank fees. The MNB's payment monitoring system contains the lists of the terms and conditions of the 10 largest retail banks in Hungary, for the period dating from the first quarter of 2014 back to mid-2011. At present, the monitoring system can be used for presenting pricing developments in payment services over the past three years for two types of payment instruments – accounts and payment cards – as well as for the four payment methods – credit transfers, direct debits, card purchases and cash withdrawals – that retail clients most frequently use. Even disregarding other methods that are less frequently used by the household sector, as well as payments via postal money orders – a payment method not incurring any direct charges from a customer standpoint – calculations can demonstrate changes in average payment fees with sufficient accuracy. For the purpose of calculations, costs were always taken into account converted into monthly expenses.

As regards account products, distinctions were made between basic and regular accounts. Basic accounts are accounts offered by the banks under review that are widely available and to which no requirements apply. Regular accounts include products that can be obtained by average net income earners and are not specifically targeted at high-income clients. For each bank reviewed, the category of payment cards features the details of three card products: unembossed debit cards, embossed cards with standard conditions, and premium – typically gold – cards offering discounted fees and a larger number of ancillary services. Estimates on the payment habits of Hungarian retail clients have been made based on the MNB's payment statistics and other ad-hoc assessments.³⁷ In our calculations, distinctions were made between transactions according to submission channel (paper-based, electronic or over-the-phone) and destination (intra- or domestic interbank transfers), as these services typically involve different fees and charges in the banks' pricing practices. For cash withdrawals, the monitoring system contains both discounted and free-of-charge transactions, thus the generated price index also reveals the impact of changes in discounts. The analysis focussed on the fee burden of Hungary's population aged above 15 years and with a payment account,³⁸ with changes in costs plotted separately for below and above the average income.

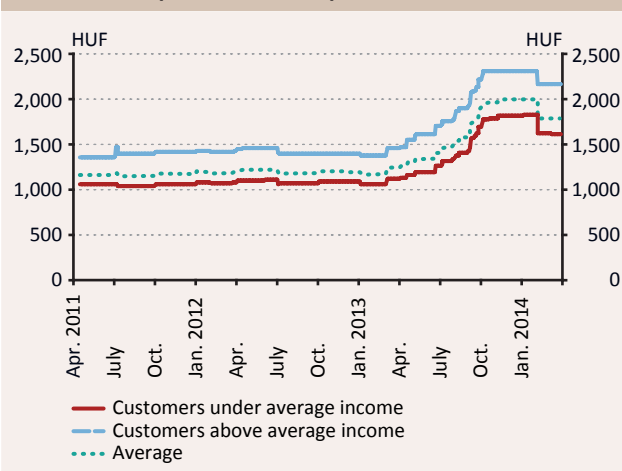
Between April 2011 and the beginning of 2013, the average payment costs of retail clients remained virtually unchanged – and even decreased in real terms, despite the growing turnover of electronic payment instruments – after which an average increase of 60 per cent was registered during the end of 2013 (Chart 14). The growing turnover rates of electronic payment instruments have an upward effect on average payment-related costs, as an increasing number of transactions are moving from cash into electronic systems, and the applicable fees are charged directly to the payer's account. However, in the case of credit transfers, this cost-increasing effect was offset by the spread of electronic submission channels. The growing share of electronic and over-the-phone submission channels, which are subject to lower bank charges,

have caused average payment-related costs to decrease in the same proportion that the growing turnover of electronic payments has increased them. After introduction of the transaction tax, a slow adjustment procedure followed which, in light of the 1 August 2013 rate increase and the imposition of a one-off supplementary transaction duty, picked up speed and was complete by October 2013. In the period since then, the introduction of free cash withdrawals was the only item having an impact on payment costs: for the average client, this meant a significant reduction in charges, amounting to approximately HUF 200 per transaction. As regards payment charges other than those applicable to cash withdrawal, it can be established that the upward effects of this regulation on fees and charges have yet to be detected.

³⁷ Calculations take into account the long-term aggregate processes of change in payment method use, as well as the observed value distribution of individual payment methods. Moreover, thanks to the detailed breakdown for value bands used in the calculations, the generated index includes the impacts of changes in not only fixed and value-proportional charges but also in minimum and maximum fees.

³⁸ The population aged above 15 years and with a payment account is estimated at slightly above 6 million.

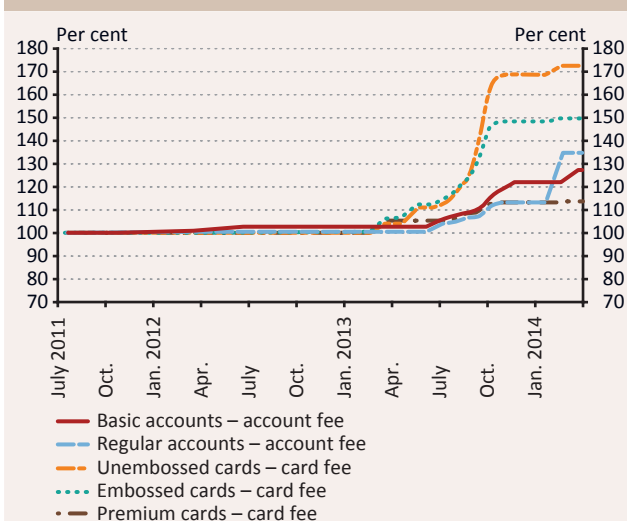
Chart 14
Changes in average monthly payment costs of retail clients from April 2011 to the present



The transaction tax impacted the pricing of different services to varying degrees, with some items reflecting increases well above the recorded average of 60 per cent.³⁹ For other payment methods, average account management fees also increased in 2013, along with a complete pass-through of the proportional transaction tax. The fees on payment services had been virtually unchanged prior to the introduction of the transaction tax, and a brisk increase was observed afterwards. Consequently, monthly account management fees rose by 20 to 30 per cent. The gradual elimination of discounts only partially explains this increase. Fees relating to regular accounts increased proportionally at a more substantial rate than those associated with basic accounts. This was due to the levels effect, because, in nominal terms, the rate of increase was nearly identical for both types of accounts, but regular accounts entail lower fees. Periodical card fees also rose at a significant rate during the period under review, particularly during the second half of 2013. The higher average price index of lower-end cards is also primarily due to the levels effect – that is, in nominal terms, periodical card fees for all three card categories rose at an equal rate (Chart 15).

Following introduction of the transaction tax, in some cases the costs of cash withdrawal rose more than threefold during 2013. However, the entry into force of the regulation on free cash withdrawals has offset the effects of such fee hikes and the first quarter of 2014 saw a notable reduction in the costs associated with cash withdrawal. After the transaction tax was first introduced, banks initially implemented relatively smaller increases in their fees on cash withdrawal; however, the increase in the tax rate triggered a faster and more pronounced adjustment process. The rate of increase was completely identical regardless of card type, as payment

Chart 15
Price index of periodical fees for payment accounts and cards



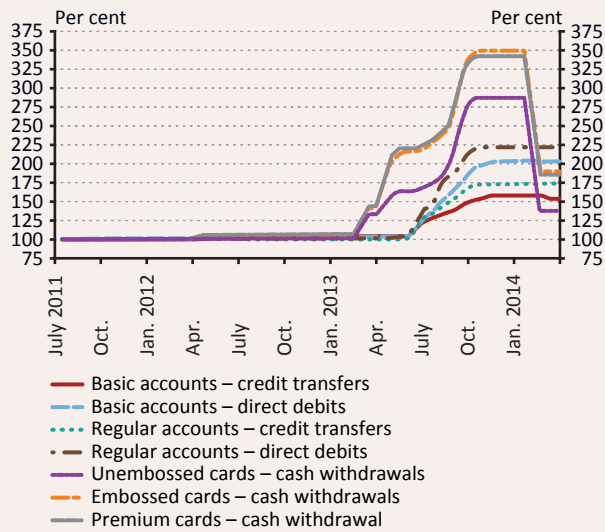
Note: 18 July 2011 = 100 per cent, values weighted with payment habits during Q1 2014, smoothed using a 30-day moving average. The significant increase in fees for basic accounts towards the end of the review period was caused by one bank's cancellation of discounts.

service providers only dispensed with the pass-through of the tax to a minor extent, in the case of gold card holders. Despite certain banks having gone as far as to charge the transaction tax directly also on the purchase amount, on average these costs are negligible compared to other items given the small weight of such institutions. The 2014 introduction of free cash withdrawals has caused significant changes in the price index, which – notwithstanding the notable reduction in the average fee burden – has yet to return to its level before the transaction tax took effect (Chart 16).

A segmented analysis reveals that payment costs are dominated by fixed charges such as monthly account management and annual card membership fees, with transfer fees representing the only significant turnover-specific cost item. The relatively low cost of direct debits is due to the small number of transactions: compared to other items, direct debits account for a much smaller share of the overall transaction volume, which keeps the related per-client costs low. However, when looking at several demographic groups with different payment habits, these costs can vary to a great extent. Clients with a preference for electronic payment who actively engage in a large number of transactions may agree that the costs of direct debits can be significant, meanwhile a notable portion of clients do not use these services at all, and typically pay their bills via postal money orders. The negligible direct costs of card purchases can be explained by the extremely rare practice of related direct debits. With the introduction of free

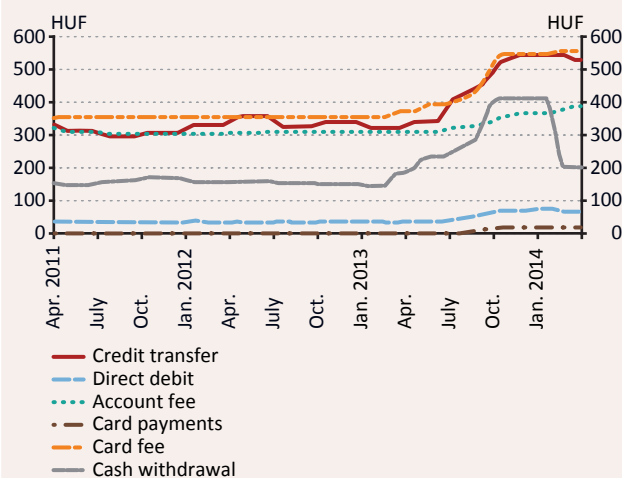
³⁹ It is important to note that due to the low number of services reviewed, individual changes in fees might have more pronounced impacts.

Chart 16
Price index of payment methods under review



Note: 18 July 2011 = 100 per cent, values weighted with payment habits during Q1 2014, smoothed using a 30-day moving average.

Chart 17
Average payment fees per client for various types of services



Note: Figures smoothed using a 30-day moving average.

cash withdrawals, and payment habits remaining relatively unchanged, cash withdrawal charges have dropped close to their pre-transaction tax level, the difference only being HUF 40 approximately. Monthly card fees have risen at an equal rate for each card category, by an average of close to HUF 200. Despite the fact that, for major payment methods, payment service providers passed on the transaction tax in proportion to the transaction amount, 2013 also saw a marked rise in the fixed costs of payment (Chart 17).

3.1.3 POSSIBLE IMPLICATIONS OF THE REGULATION ON FREE CASH WITHDRAWAL INTRODUCED IN 2014

As a result of the regulation providing retail clients with the availability of free cash withdrawals for up to HUF 150,000 per month, changes in the structure of retail payments might be expected in the short term already. Looking ahead, the spread of electronic payment methods could be affected to an even greater extent. The regulation's short-term impacts can also be deduced from changes in currency in circulation, whereas developments in the volume of electronic payments and cash withdrawals can reveal its long-term implications. Since a number of factors may be at play and impacts may vary across different demographic groups, the regulation's influence on the execution of payments cannot be accurately forecasted. However, even in the short term, the cash withdrawal regulation may lead to increases in the volume of both retail cash withdrawals and household cash holdings. The actual consequences of the regulation can also depend, besides the adjustment of households, on the behaviour of businesses, who typically decide on the further use of cash spent by households in the corporate segment. Whether it gets channelled back to the banking system or used by firms in additional payment transactions can also cause changes to currency in circulation.

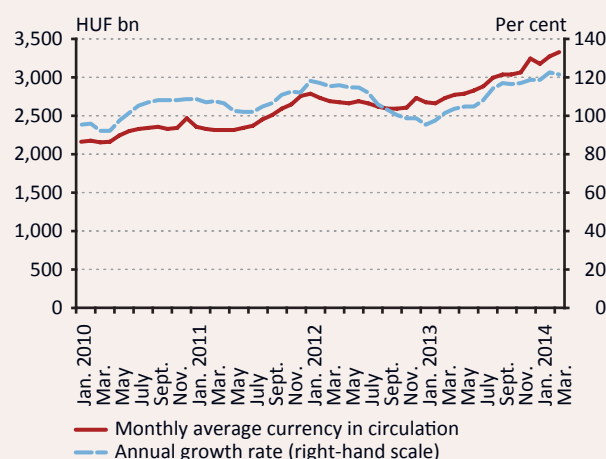
At the individual level, the availability of a retail cash withdrawal amount at no cost or at a reduced charge greatly influences cash withdrawal habits. Payment statistics suggest that retail clients still have significant leeway for adjustment, and thus for increasing the volume of cash withdrawals. Based on previous analyses, it can be concluded that there is a direct correlation between the number of transactions offered by payment service providers to their clients, either at a discounted fee or at no cost, and the number of cash withdrawals executed by the clients. It can be observed that, to avoid higher costs, clients adapt to the number of transactions offered at a discount and adjust their cash withdrawal habits accordingly. Given that, following the introduction of the transaction tax, the range of discounts offered by payment service providers narrowed while cash withdrawal fees increased, in the short term clients were faced with higher costs, which they could have reduced primarily by adapting their payment habits and shifting towards electronic payment methods. However, as free cash withdrawals become available, there is the possibility that retail payment habits can be adjusted faster in order to cut payment costs, prompting certain client segments to make utmost use of the available free cash withdrawal amount. In order to

estimate the regulation's possible impacts, cash withdrawal data for previous years should be considered. According to estimates on the number of retail payment accounts and the share of account holders in relation to the total population, consumers could be eligible for free cash withdrawal linked to an approximate 6 million accounts. On average, an eligible client made one and a half cash withdrawals totalling HUF 75,000 per month in 2013. Therefore, previous payment habits would have only led to a 50 per cent utilisation rate of the free cash withdrawal limit. Since retail clients previously spent a part of their income, transferred to their accounts, in electronic transactions and another portion in cash withdrawn from their accounts, a higher utilisation rate of the free cash withdrawal amount is only possible to the detriment of electronic payment volumes, assuming that disposable income remains unchanged. To estimate the impacts of such an adjustment, it is worth taking into account the transaction volume of payment methods that people can easily substitute with cash. These primarily include payment card purchases and direct debits. In the majority of cases, these payment methods can be substituted with either cash or any of the alternative methods available for paying bills at the post office (yellow and white cheque). In an extreme scenario where all of these transactions were substituted with cash, the utilisation rate for cash withdrawals would reach 77 per cent. Nevertheless, it is important to note that for a certain part of retail clients, the income that is regularly transferred to their accounts does not allow for a full utilisation of the free cash withdrawal limit. Higher-income earners can only offset this with their possibly larger volume of cash withdrawals to a limited extent given the 150,000-forint monthly limit, therefore, the above-mentioned utilisation rate of free cash withdrawals cannot be attained for society at large.

Changes in cash in circulation only allow for limited conclusions on short-term changes in cash usage habits; analyses must also take into account the impacts of additional factors affecting currency in circulation. The volume of cash in circulation is fundamentally determined by three factors of demand: demand for cash for transaction purposes, demand for cash for savings, and demand for cash in the shadow economy. Alongside seasonal fluctuations, changes in overall currency volume have recently included spike values as well, which could be due to shifts in the forint exchange rate just as much as to interest rate developments. Under a weaker exchange rate – assuming a temporary setback – economic agents' exchange of their foreign currency holdings into forint can increase the volume of currency in circulation, and in a lower interest rate environment the same agents would be less compelled to cut back on their savings or cash holdings, as the interest loss on cash holdings could also be lower in this case. Furthermore, a pick-up in retail trade can also increase the volume of currency in circulation.

In contrast to previous years' trends, sharper increases could be observed in the volume of currency in circulation during the summer of 2013 and in February 2014. Besides the weakening of the forint exchange rate, the growth last summer may have also been driven in part by the increase in

Chart 18
Monthly average volume and annual growth rate of currency in circulation



the transaction tax rate. That is, before the tax rate on cash withdrawals was doubled in August 2013, certain economic agents might have resorted to advance withdrawals in an attempt to see their payment costs reduced, if only on a temporary basis. However, this scenario implies a one-off effect, with neither currency volume data nor payment statistics providing any information as to whether there was any profound, lasting change in economic agents' payment habits. February 2014 also saw an increase in the volume of currency in circulation, in excess of what previous trends would have suggested. To a certain degree, this may have been due to the introduction of free cash withdrawals, but the impacts of exchange rate fluctuations might further complicate the picture. In view of the regulation taking effect, payment service providers were likely to have prepared for an upsurge in the volume of cash withdrawals, and therefore their cash holdings were increased compared to previous periods. On a similar note, retail clients are also likely to have increased their withdrawals from payment accounts after the regulation went into effect. In the short term, the regulation has therefore brought about increases both in the demand for cash and the volume of currency in circulation (Chart 18). Nevertheless, when it comes to assessing the impacts on payment structure and payment habits, the extent to which such excess currency outflows will actually remain in the economy over the long term must also be taken into account. If the proportion of income transferred regularly to payment accounts does not decrease over the long term and the cash that is directed

into the economy via retail cash withdrawals is periodically channelled back into the banking system, retail clients can continue to use electronic payment methods at a rate higher than the current even if the volume of cash withdrawals were to increase.

3.1.4 PRICING IMPACTS OF THE REGULATION OF INTERCHANGE FEES ON PAYMENT CARD PAYMENTS

Due to the regulation of interchange fees, fees have decreased on transactions with the most common types of cards, resulting in a short-term fall in revenues from merchants accepting card payments collected by payment service providers issuing payment cards. The regulation is likely to have two types of impact on the pricing of payment services. First, on the merchant side, the fees payable on card acceptance must decrease, allowing merchants to accept card payments with lower fees in the future. Second, in the short run, if card issuers compensate for their loss of revenues in the wake of the regulation, the price of services to their clients may increase. This may entail a rise in card payment related costs. The practice applied by banks in passing on the transaction tax will likely primarily trigger a further increase in annual card fees, but other service fees may also increase through cross pricing. Directly adding charges to payment transactions will presumably not be applied by many issuers, as this could hold back the rise of card payment turnover over the long run and may, in conjunction with the other recently introduced regulations, stimulate increased cash use among consumers.

In the wake of the pricing developments in 2013, payments service providers are likely to increase card fees to a far lower extent than suggested by lost revenues, and to try to offset these lost revenues by other ways. Another option for offsetting the revenue shortfall besides raising card fees is to

reduce the number of additional services associated with cards or to scale back service levels. This could transform services other than payment and cash withdrawal functions into real additional services available for cardholders under transparent pricing terms. In the coming months, an increase in card related costs and scaling back of additional services are expected occur in parallel. An analysis of the pass-through of the transaction tax revealed that annual card fees already rose at a higher rate than the tax in 2013, while the tax was directly passed through for the majority of transactions. On this basis, can be assumed that the impact of the revenue shortfall stemming from falling interchange fees has already been priced into payment cards by market participants. The rise in card purchase turnover in past years may offset the revenue shortfall incurred in 2014 due to interchange fee cuts over the span of a few years for card issuers, and thus a sharp increase in fees on the grounds of such cuts in 2014 is not warranted.

Lower merchant-side costs in the wake of lower interchange fees could foster the development of the acceptance network and contribute to the faster spread of card payments by providing an incentive through the regulation for larger merchants to promote card usage. By cutting fees, the difference in the cost of card acceptance and cash management may already be reduced to a minimum within this segment in the short run. If the substantial difference between the processing costs of these two transaction types is eradicated on the merchant side, merchants gain an incentive in promoting card usage, which offers them the advantage – in addition to the immediate cost-cut – of streamlining administrative processes and speeding up service, which in turn present additional benefits. In this case, a more dynamic rise in card usage than before could see the revenue shortfall compensated earlier on the issuer side as well thanks to the regulation, and thus the fee cuts may also yield benefits for card issuers in the long run.

3.2 Possibilities for transforming the pricing of the retail payments clearing system

One of the potential development directions for the ICS may be to transform service pricing and introduce a more efficient and internationally more competitive pricing structure. Such a transformation of the current ICS fee structure could enable payment service providers to render electronic payment services at lower, and thus more competitive prices than at present. The volume of electronic payment transactions is continuously rising in Hungary, and the number of transactions cleared within the ICS is also increasing in conjunction with growing nominal GDP, creating greater demand for efficient and low cost clearing of payments transactions among banks.

Due to the cost structure of executing electronic payment transactions, as the number of transactions continues to rise, the price of clearing services can be scaled back, which must fully be reflected in the pricing of services rendered to the customers of payment service providers. As electronic payment infrastructure typically has elevated fixed costs

but far lower variable costs, transaction processing costs do not increase in proportion to the number of transactions. In addition, it should be noted that the ICS has the capacity to handle a far higher number of transactions than at present, and could therefore accommodate even a substantial increase in turnover without any capacity expansion necessary. Therefore, the higher the number of transactions within the system, the lower the cost per transaction, meaning that a rise in turnover could pave the way for cutting fees following their review. Lower fees could also narrow the gap between the fees of large European clearinghouses and those of the ICS, making the latter's services more competitive both on the international scene and compared to other electronic payment solutions. Thanks to its acquisition by the MNB of a majority share in GIRO, the operator of the ICS, steps resulting in fee reduction can now be implemented more easily, enabling cost reduction and payment efficiency gains that are also felt by bank clients.

4 Factors affecting the liquidity of payment and securities clearing and settlement systems

One of the most important characteristics of the payment systems is the volume of liquidity required for settlement. Smooth execution of transactions is pivotal in maintaining the efficiency of the Hungarian money and capital market and confidence in its financial infrastructure. A substantial part of settlement of the cash leg of customer and financial transactions takes place in VIBER (also both KELER and GIRO submit their cash-side intraday settlement requests to VIBER).

The liquidity of VIBER participants consists of two elements: the current account balance and the intraday credit lines backed by collateral. The liquidity of payment systems was essentially shaped by two factors in 2013: the adjustment to ICS intraday clearing and the Funding for Growth Scheme. As of August 2014, another factor will come into play in shaping the liquidity of payment systems: the elimination of MNB bills and their removal as an instrument of eligible collateral.

4.1 Impact of intraday clearing on the liquidity of systems

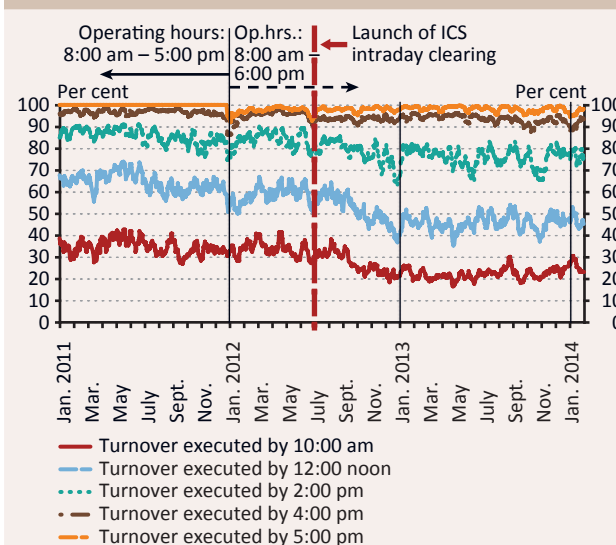
Following the introduction of intraday clearing, adjustment to the new system was complete by mid-2013. Adjustment can be measured through changes in the behaviour of system participants and their clients. This measurement covers the choice between VIBER and ICS in the case of payment transactions, the re-channelling rate between the systems and developments in the intraday timing of VIBER transactions. In addition, the reasoning behind participants' choice of a liquidity parameter also bears relevant information. The reasons behind the roll-over of transactions between clearing cycles illustrate the successful change in liquidity management behaviour.

Since the introduction of multi-cycle ICS intraday clearing, as opposed to their previous practice, customers execute numerous payment orders through ICS rather than through VIBER.⁴⁰ The rise in the number and proportion of transactions of over HUF 100 million within ICS continued in the first half of 2013. This was driven by the migration of a portion of VIBER customer transactions to intraday clearing, resulting in a nearly HUF 600–800 billion increase in ICS turnover. This migration may have been driven by the fact that VIBER is no longer needed to complete all time-critical customer transactions due to intraday clearing, which now can be used as an equivalent option in certain cases. The different pricing of VIBER and ICS transactions by banks presumably largely impacts the choice between the two systems, as banks generally apply far lower transaction fees for ICS as compared to VIBER.

Another effect of the adjustment process to the new clearing system was the timing of transactions by VIBER participants, which had shifted significantly to later hours during the day in the second half of 2012 before this practice became permanent in 2013. The timing of transactions has been one of the liquidity management tools used by banks, allowing them to define within certain limits the initiation time of their transactions within the ten-hour operating hours of VIBER. Stricter control on sending is linked to the management of time-critical transactions, such as the provision of collateral for intraday clearing. This means that some banks deliberately set

aside liquidity during the day and do not initiate transactions immediately before the collection of collateral linked to intraday clearing cycles. After the launch of intraday clearing, the adjustment in liquidity management, and thus in the timing of transactions, was concluded for the most part by 2012. In the first half of 2013, turnover shifted to slightly later in the day, but had returned to its original level by the end of the year. On an annual level, 75–80 per cent of VIBER transactions are settled by 2:00 pm. Only five per cent of VIBER turnover was left for the last hour, as only bank-to-bank transactions can be executed at that time, mainly allowing participants to close their daily positions (Chart 19).

Chart 19
Timing of turnover in VIBER
(2011–2013)



The intraday forecasting of exogenous transactions flowing out from the ICS on tax payment days shows great uncertainty, which can be managed by VIBER and ICS participants by changing the timing of transactions and with tighter liquidity management. On tax payment days, substantial payment transfers, and thus liquidity transfers, are made by participants via ICS intraday clearing towards the

⁴⁰ Miklós Luspáy–Annamária Madarász (2014): The effects of the introduction of intraday clearing on turnover in Hungarian payment systems *MNB Bulletin*, March.

Hungarian State Treasury (MÁK), which basically temporarily exits the payment systems, as this liquidity is not available for participants during the day. If banks fail to duly assess in advance the value of outgoing transactions (payments initiated by their clients) that can be expected until the end of the day, they are left with only 1-1.5 hours to ensure the necessary liquidity during and after the last ICS intraday clearing cycle, until VIBER closes. If they do not have enough liquidity at the end of the day, MNB provides an overnight collateralised loan up to the utilised and unrepaid intraday credit line. Due to higher turnover on tax payment days, banks need to ensure additional liquidity in most cases.

The number and value of transactions rolled over between ICS intraday cycles increased in 2013 compared to the previous year. This fact does not jeopardise the stability of the system in itself, but could point to a temporary problem in the liquidity management of certain system members. If a participant has insufficient funds to settle its transactions during a specific clearing cycle, the transaction is automatically transferred to the next clearing cycle for execution. This is referred to as a rolled-over transaction. In 2013 the majority of rolled-overs stemmed from liquidity shortages of individual banks, which could have been prevented with the due circumspection by increasing liquidity by pledging a portion of the eligible collateral on their balance sheets. If system participants continuously monitor their liquidity and ICS turnover, and identify any potential liquidity shortages, they can increase liquidity using intraday pledging of collateral

at any time. According to the MNB's findings, in 2013 one system member did not have sufficient eligible collateral on its balance sheet to be pledged, meaning that an actual liquidity shortage was the cause of transaction roll-over, but this did not impact the other participants. Another system participant's transactions were rolled over in two consecutive cycles despite the fact that its liquidity could have been increased by pledging additional collateral. As a consequence of that, payment orders submitted in the first cycle were rolled over two times, and the four hour execution time rules required under legislation⁴¹ were probably breached.

The liquidity impact of intraday clearing turnover in ICS on the entire payment systems (its liquidity need) is highly dependent on the choice of liquidity parameters by the participants.⁴² In 2013 one system member opted for the net+basis, while two opted for the net funds parameter. Executing intraday ICS turnover did not cause any difficulties for most participants opting for the gross funds parameter, due to ample intraday liquidity. The significance of the net funds parameter could increase in the event of a potential bank (individual or systemic) liquidity shortage, as the choice of the net funds parameter could make the execution of payment turnover for participants easier in the context of providing collateral, due to the incorporation of the funding impact of incoming items. According to the MNB's findings, the roll-over of transactions between cycles in 2013 would also have taken place if applying the net funds parameter.

⁴¹ MNB Decree 15/2010 (X. 12)

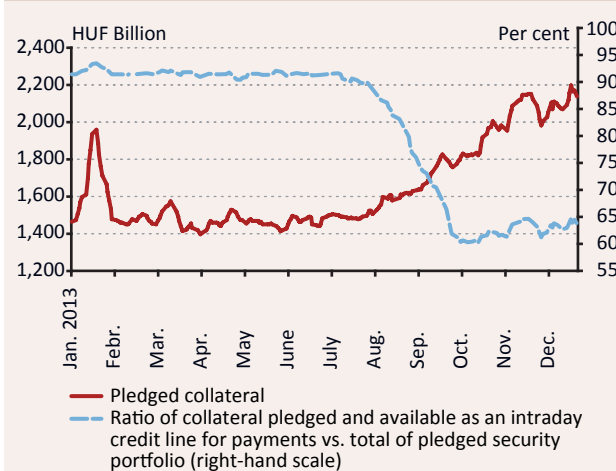
⁴² In the intraday clearing introduced on 2 July 2012, participants are required to have sufficient funds on their account with the MNB for settling the transactions in the given clearing cycle. Each month, participants can select whether they wish to provide the funds on the basis of (1) their net position vis-à-vis participants, as calculated by GIRO Zrt. for each cycle; or (2) their total debit/outgoing turnover (on a gross basis) or (3) as a combination of the aforementioned two options, on a net plus a given amount (net+) basis. If the gross funds parameter is set, then the transactions will be definitely cleared, regardless of the collateral of the other participants, whereas in the other two cases clearing will be dependent in part on the funds of the other participants.

4.2 Impact of the Funding for Growth Scheme on payment system liquidity

As a result of the Funding for Growth Scheme (FGS) launched in 2013, the ratio of collateral pledged to the MNB and available as an intraday credit line for payments has declined within the security portfolio, but this did not increase the clearing and settlement risks in VIBER, because of adjustment by participants. Payments system participants are able to fulfil payment orders up to the limit of the intraday credit line received in exchange for their securities pledged to the MNB and the account balance available on their current account kept at the MNB. However, the various collateral pledged to the MNB not only serve as cover for the intraday credit line available for use in payment systems, but also as cover for overnight and long-term loans provided by the MNB. In the second half of 2013 an increasingly large portion of the stock of securities pledged to the MNB were allocated to provide cover for FGS loans, leading to a reduction in the collateral pledged to payments. While the first half of the year 90-95 per cent of pledged collateral was available for payment purposes prior to the introduction of the FGS, this ratio fell to 60-65 per cent by the second half of the year, following the FGS's introduction. In order to retain the liquidity required previously for their payment transactions, starting from August 2013 banks continuously increased their stock of securities pledged to the MNB (Chart 20). The higher volume of securities pledging caused a minor shift in the composition of securities, with the rise in the ratio of Treasury bills (5.5 percentage points) and government bonds (5 percentage points) compared to 2012. Due to the adjustment of banks (in the form of additional pledging of securities), the liquidity available for payments remained essentially unchanged (Chart 9).

The number of intraday credit line modifications within the VIBER rose markedly in 2013. The intraday credit line is one of the elements of payment system participants' liquidity which can be increased or decreased at any time during VIBER operating hours. Participants can ensure sufficient liquidity

Chart 20
Impact of the Funding for Growth Scheme on payment systems
(2013)



through the intraday pledging of collateral if they hold eligible securities not yet pledged to the MNB. Securities can be pledged and unpledged (modifications of credit line) with the cooperation of KELER, where securities collateral is kept on record, and the MNB's systems. Banks can initiate modification of the credit line with KELER, and KELER forwards the request toward the MNB following verification of the securities leg, where the new credit line is set in VIBER. The tests conducted during the year revealed that the process required 5 minutes on average. In case of various pledging of securities by an individual VIBER participant, processing does not take place in parallel, but consecutively, and therefore the 5-minute execution time applies per security type. The higher number of credit line modifications stems mainly from FGS, but intraday pledging of securities was needed for executing ICS intraday clearing cycles in several cases.

4.3 Potential impact of the transformation of MNB bills on payment systems liquidity

Owing to the transformation of the MNB bill into central bank deposits, banks must ensure sufficient liquidity for the execution of their transactions in the payment system by pledging securities, assuming they maintain their previous behaviour. Based on the MNB's decision, as of 1 August 2014 the MNB bill will be eliminated and transformed into a central bank deposit. As opposed to the MNB bill, however, the new instrument will not be eligible as collateral accepted by the MNB. Since the two-week MNB bill constituted the bulk (nearly 40 per cent) of the securities pledged by banks as collateral, the new regulation requires adjustments both at the level of the payment system and on an individual bank basis.

According to the MNB's calculations, in order to ensure the execution of payment transactions in payment systems on an individual bank basis, the banking sector must pledge other collateral worth around HUF 500 billion to replace the MNB bill. If the stock of pledged collateral is insufficient on an individual bank basis once MNB bills have been removed from providing cover for the largest negative account balance, the new regulation requires adjustment by the banks. Bank-side adjustment can take place according to four scenarios:

- 1) Banks can ensure additional liquidity by pledging additional eligible securities, if available.
- 2) If they do not have sufficient eligible securities, they can purchase government securities to create additional coverage for pledging.
- 3) If their available reserve ratio is below the maximum 5 per cent, they can increase it, taking advantage of the liquidity

flexibility offered by the reserve ratio. If they wish to manage the situation using higher excess liquidity than the liquidity provided by their reserve ratio, this could cause the increase of the stock of overnight deposits.

- 4) If they do not have sufficient eligible securities, banks can adjust by changing the timing of their outgoing transactions, thus shifting the initiation of their transactions later or holding transactions waiting for incoming payments.

The MNB's preliminary study has revealed that the exclusion of MNB bills from eligible collateral will require 20 banks to adjust in terms of payments. Based on historical data,⁴³ the MNB examined the turnover of specific banks in the payment systems if the entire stock of MNB bills were removed from both pledged and eligible stock. Approximately 59 per cent of VIBER participants are not expected to require any adjustment, as they have enough liquidity for executing payments even without MNB bills. The other roughly 41 per cent of banks, however, do need to adjust to the new situation as the MNB bills were necessary for executing their payments in the past. Sixteen per cent of VIBER participants held other eligible securities on their balance sheets to substitute the MNB bills, while 25 per cent did not. These VIBER members would not have had sufficient liquidity to execute their payments, substantially increasing the clearing and settlement risk in the payment systems. The MNB examined historical turnover data and daily liquidity *ceteris paribus* in the context of its calculations. The system's liquidity requirements can only be higher due to the aforementioned impact of the FGS, as utilisation of the entire FGS volume would substantially impact the excess liquidity available for payments.

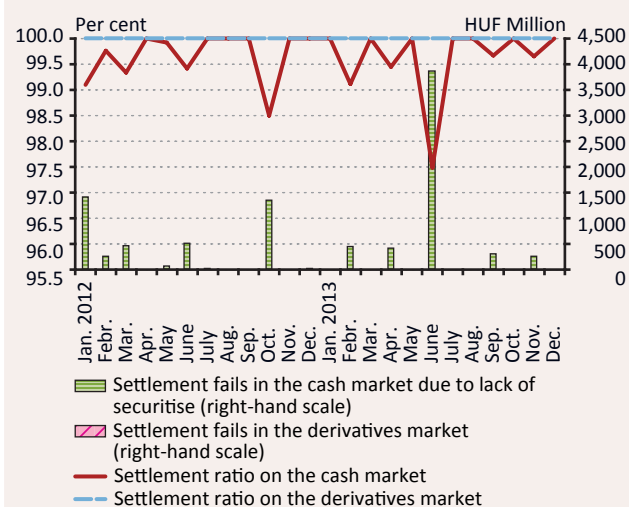
⁴³ The study covers the period between 1 January 2013 and 31 March 2014.

4.4 Fails in the securities clearing and settlement system

While no fails occurred on the derivatives market in 2013, similarly to the previous year, the rise in the value of fails on the cash market compared to previous years led to an increase in clearing and settlement risk. Fails in the securities clearing and settlement system suggest clearing and settlement risk within the system. The value of fails on the cash market continued to rise in 2013, but their quantity (i.e. occurrence) decreased significantly (Chart 21). In 2012, in order to reduce the number of fails, KELER CCP extended the settlement deadline on the spot market from 11:30 am to 2:00 pm. This measure was partially successful, as the number of fails decreased. Their value, however, rose markedly by 30 per cent. One large fail was one of the factors contributing to the increase, coupled with the more than doubling of the average value of other fails. Fails occurred due to securities-side liquidity shortages in every case, caused by fails along the counterparty chain, presumably due to sudden spikes in market turnover. In 2013, similarly to the previous year, fails mainly occurred among government bond transactions, with only a minor portion linked to shares. The concentration of settlement fails is high on the cash market, with two of the 31 KELER CCP clearing members responsible for them in 2013. Clearing members explained that the fails resulted from the clearing member or non-clearing member expecting the delivery of securities from a client in a short position, and the client failing to meet its obligation on time. This corroborates our assumption that clearing members and non-clearing

Chart 21

Value of settlement fails and the settlement ratio on CCP cleared capital markets



Note: No fails occurred on the derivatives market during the period under review.

members were also in a short position, i.e. transferred the securities without actually being in their possession, preventing them from closing their short selling transaction on time due to delays across the counterparty chain.

Box 2

Fails in the securities clearing and settlement systems

On the markets guaranteed by KELER CCP, a settlement failure occurs if the clearing member does not fulfil its financial, collateral or securities obligations relating to the clearing of transactions and positions in the required manner or on time, i.e. fails to provide the funds or securities necessary for settling the transaction on time. The rules of procedure for handling fails differs for each market. Management of the risk of default concentrated within the central counterparty is ensured by a guarantee system, emergency measures and complex default management rules of procedure. The latter has been sufficient in the past for addressing default prior to the utilisation of the guarantee system.

4.5 Impact of the changes in the banking system's market structure on payment systems

Changes in the market structure of the banking sector exert an impact on the operation of payment systems and on the market of payment services as well. Recently, there have been reports of certain financial institutions exiting the Hungarian market that are active banks within payment systems. This exit could occur in several different scenarios, but one in which they suddenly cease all operations in Hungary is not plausible. The least probable form of exit is a gradual one extending over several years, while a more probable one is the sale of banks in one or several portions. A combination of the two is also an option, with banking activities separated into two distinct parts. One would be the good portion, and the other the bad portion, the latter written off by the original owner as loss and gradually unwound. The following section presents the impact on Hungarian payment systems of four exit scenarios for a bank situated in the upper third of the market in terms of size.

The impact of a larger bank's exit on the payment systems depends on numerous factors; nevertheless, neither potential scenario is expected to generate a substantial increase in risks. Changes in payment system participants could impact system turnover, system concentration, the group of critical participants,⁴⁴ the degree of clearing and settlement risk and systemic risk, depending on to whom the exiting bank

transfers its payment operations. Besides a gradual exit, three sales scenarios are possible. In the first scenario, one of the large banks remaining in Hungary would acquire the exiting bank, while the second scenario would consist of a small or medium-sized bank, or possibly cooperative society financial institutions acquiring the exiting bank. In the latter scenario, these participants would presumably be able to acquire portfolio portions and smaller units. In the third sale scenario, a new banking actor would turn up on the Hungarian market and take over the operations of the exiting bank (Table 5).

a) Unwinding

In a scenario of gradual unwinding of activities in Hungary, the bank's payments will also gradually shift to the other participants remaining in the financial market. In this case, the decisions of clients of the exiting bank would determine where payments would be channelled depending on their choice of payment service provider. Two extreme cases are possible. In one scenario, all clients choose the same bank; in the other, they choose equally among all the remaining banks. The most probable scenario is one where the clients of the exiting bank choose among the remaining payment service providers consistently with their prevailing market share. This could lead

Table 5
Impact on Hungarian payment systems of the exit of a bank situated in the upper third of the market in terms of size

Scenario	Turnover of the payment systems	System concentration	Group of critical participants	Risks (clearing and settlement risk and systemic risk)
Unwinding	turnover will decrease slightly	concentration of large banks will increase slightly	individual liquidity needs of the remaining banks would not rise materially	risks would not be increased
Sale to a large bank	turnover will decrease significantly	concentration of large banks will increase significantly	probably would not need to increase liquidity	clearing and settlement risk could increase, systemic risk will increase
Sale to small or medium-sized banks	turnover could decrease slightly	concentration will not change in the short term	liquidity need to be increased, change in liquidity management	clearing and settlement risk will increase, systemic risk will not change
Sale to a new market participant	turnover will not change in the short term	concentration will not change in the short term	will not change	risk level will not change

⁴⁴ The group of critical participants includes the clearing system participants the default of whom could substantially increase systemic risk.

to a portion of the payments executed vis-à-vis the exiting bank being internalised among the remaining participants. However, this cannot amount to a substantial volume, meaning that payment systems turnover will not decrease significantly. For one, because a gradual re-channelling of clients could unfold over several years, and secondly, the concentration of clients changing to a different the bank would be low among the remaining market players. This would not have any significant impact on critical participants, and the individual liquidity needs of the remaining banks would not rise materially in the wake of the exit. This scenario would not have any marked upside impact on clearing and settlement risk or systemic risk.

b) Sale to a large bank

If a larger bank acquires the exiting payment service provider, the impact on Hungarian payments would be more substantial. This is due to the fact that the interbank turnover previously conducted between the two banks would exit the payment systems by becoming intrabank items, which could result in a decrease in payments turnover, coupled with the rise in the market concentration of payment service providers. The group of critical participants would lose a major participant, and the acquiring bank would have to entirely assume all banking operations. Despite the decrease in payments across the entire sector, the acquiring bank would see a rise in its payments turnover, which would require sufficient collateral for these transactions. The higher turnover of the acquiring bank could increase clearing and settlement risk in the payment systems, especially in the period immediately following the acquisition. The acquiring bank would need to adjust its liquidity management to the new situation, which could even give rise to temporary liquidity shortages in extreme cases,

leading to delays in clearing and settlement and thereby further increasing clearing and settlement risk. The acquiring bank's higher market share would increase its market significance, thus exacerbating systemic risk.

c) Sale to small or medium-sized banks

In the event of acquisition by small or medium-sized banks, payments turnover would decrease to a far lesser degree than in the previous scenario. The increase in banks' internal turnover would also be smaller, and their payments made vis-à-vis large banks would remain within the payment systems. These smaller participants, however, would increasingly become critical participants within the system, requiring the transformation of their intraday liquidity management prior to the acquisition. Inadequate preparation for the acquisition could give rise to clearing and settlement risk, but not systemic risk.

d) Sale to a new market participant

In the event of acquisition by a new participant, the turnover of payment systems would remain largely unchanged, assuming that the new participant conducts banking operations similarly to its predecessor. The new owner could apply a new strategy that could affect payment services, but these impacts would only materialise gradually over a longer time span following the acquisition. Payment system concentration would also remain largely unchanged in the long run, as the entry of a new participant would not increase the risks of payment systems.

Box 3

Impact of market participants exit on the payment services used by clients

In examining the impact of a bank exit from the Hungarian market in terms of payments, we must assess the changes in the usage of payment services used by clients, in particular payment accounts and cards. As an exit is executed in a controlled manner in the above scenarios, these services are not likely to be affected by any obstacles. If a bank cuts back its operations gradually over the course of several years, it leaves ample time for clients to open payment accounts at other payment service providers and request various related services and means of payment. Following this, they can then transfer their balance managed by the earlier bank to their new service provider. If the exiting bank is acquired either fully or broken down into parts, the former's clients automatically become clients of the acquiring bank. This means that their accounts and cards are also transferred to the new participants, and therefore in the short term no changes can be expected in the terms of the services used. In the longer run, the services provided could undergo unification, for which the new owner can announce new terms and conditions in line with the deadlines defined in legislation. The acquisition of the exiting bank by a new market participant would have the least short-term impact on the payment services used by clients, as the new owner would take over the entire client and service portfolio of the exiting bank.

4.6 Impact of changes in the payment system membership

Changes in the membership level can impact the turnover, liquidity and risks of payment systems, the degree of the impact depending on the volume of payments executed by the financial institutions changing their membership level.

Banks can choose from two membership levels in payment systems, opting to either join the systems directly or indirectly. Direct system participants execute payment through their own accounts, while indirect participants execute payments through the accounts of direct participants. Direct participants can increase the clearing and settlement risk of payment systems by enabling the accession of indirect participants executing excessively high turnover in the payment systems. This could entail a situation where the direct participant encounters a temporary liquidity shortfall for meeting the needs of higher turnover. The operators of payment systems must therefore collect basic information from direct and indirect participants to duly identify, monitor and manage the risks arising from this tiered membership system. They must identify the interdependencies between direct and indirect participants, as well as the indirect participants accounting for large portions of system turnover or of the turnover of individual direct system members. Participants decisions on their membership level are primarily shaped by business policy considerations, as there are currently no statutory requirements (except for cooperative society financial institutions) imposing the choice or change of membership level depending on specific indicators.⁴⁵

Due to the transformation and reorganisation of the saving cooperatives sector in 2013, the group of direct and indirect participants of the payment systems has changed, but this did not have any significant impact on the operation of the systems. As of 1 November 2013, pursuant to the government

decree⁴⁶ 15 saving cooperatives and credit unions which were formerly direct participants in the Hungarian payment systems – i.e. ICS and VIBER – became indirect participants through the Magyar Takarékszövetkezeti Bank (Takarékbank). Their turnover in the payment systems were significantly lower than that of Takarékbank: between November 2012 and March 2013 their aggregate VIBER turnover amounted to 5.82 per cent, while their ICS intraday clearing turnover amounted to 8.26 per cent of that of Takarékbank, and thus no significant liquidity dependency materialised between the new indirect participants and Takarékbank. This change in membership level could entail a channelling of a portion of interbank payments into quasi-systems, such as the internal accounting system of Takarékbank, reducing payment systems turnover. The transactions and payments executed between indirect participants, and naturally between their clients and transactions with Takarékbank would be channelled into these quasi-systems. Between November 2013 and March 2014 compared to the corresponding periods of the previous years, the aggregate VIBER turnover of these new indirect participants and Takarékbank – taking into account bank to bank and customer transactions – fell by 7.2 per cent in terms of value and 16.9 per cent in terms of transaction number, while their aggregate ICS intraday clearing turnover increased by 13.14 per cent. The latter was also driven by improving real economic performance and the resulting rising turnover trend of intraday clearing. As a direct participant in both systems, Takarékbank was able to execute both its own turnover and that of the indirect participants joining through it. In light of these figures, the indirect participants did not entail a rise in the clearing and settlement risk of either Takarékbank or the payment systems.

⁴⁵ Such as size of the capital or market share, for instance.

⁴⁶ Decree on the transformation and reorganisation of the saving cooperatives sector and the provision of necessary funding.

5 Development trends and directions of payment services and payment systems

5.1 Developments affecting the clearing of retail payments

One of the primary objectives of the MNB is to move the clearing of all payment transactions initiated within ICS to the intraday system within the foreseeable future, and to close overnight clearing system in ICS. One of the key medium-term objectives of the introduction of intraday clearing in 2012 was to move the clearing of all payment transactions initiated by bank clients in ICS to the intraday system. This would make the overnight clearing system unnecessary, which has already seen a substantial decline in usage of capacity since the introduction of the intraday clearing system. The MNB expects to lower the operating costs of the ICS once the overnight system is closed down, which not only boosts competitiveness, but also makes clearing services cheaper for clients. The overnight clearing system is currently used for clearing of transactions submitted by clients on paper, transactions initiated by the Hungarian State Treasury (MÁK), core direct debits and other debit-type payment methods. One key point is that channelling clearing of the above-mentioned payment transactions to the intraday system is essentially a technical change, and with the exception of Hungarian State Treasury transactions, does not entail any change in execution time for financial institution. The successful technical migration calls for the completion of two important tasks. First off, a process for handling transaction processing peaks during public sector wage and pension payment periods for transactions initiated by the Hungarian State Treasury must be elaborated, and secondly, the interbank standard for direct debits must be transformed to allow their processing within the intraday clearing system.

Among the developments in the conditions of use of electronic payment options, special emphasis must be placed on developing GIRO services to allow them to contribute to further accelerating transfers between clients in the near future. One possible solution could be to condense

the intraday transfer clearing cycles, another one may be to introduce instant credit transfers. As the use of the VIBER allowing real-time credit transfer is mainly a possibility for larger corporations due to its higher costs, expanding electronic payment options by accelerating the execution could also yield a positive impact for the number of transactions. At the time of introduction of intraday credit transfers in 2012, the possible need for condensing intraday cycles later on had already been identified, with several clearing houses using 30-minute clearing cycles across the European Union. Based on the structure, capacity and operating experiences of the Hungarian clearing system operated by GIRO, there is leeway for condensing cycles which would allow transfers to be executed in under two hours, cutting the currently mandatory maximum four hour execution time in half.

With the introduction of instant credit transfers, many retail cash transactions could be replaced by electronic payments among individuals, and many payment situations at merchants could be completed using cheaper and faster solutions than payment card payments. Cash payment is currently the most practical means of payment in many situations, having no suitable electronic alternative. These include time-critical transactions, the transfer of small values among individuals and payment situations where a lack of trust calls for the use of cash, such as online purchases or purchases of property or other high-value movables. Many of these payment situations could be managed electronically in an instant credit transfer system. Payment transactions carried out in an instant credit transfer system would be completed in seconds, any time of the day, 24/7, including weekends and transferred from the payer to the payee. This would give customers greater flexibility and freedom than the currently available services, freeing them from the constraints of bank

business hours and the need to submit payment orders adapting to the operation of clearing systems, as the transfers could be completed at any time. Instant credit transfer systems could therefore be used in any payment situation where the fastest possible availability of the paid amount is key, and immediate execution can circumvent issues arising from lack

of trust among economic agents and the ensuing cash usage. Before the introduction of instant credit transfer services in Hungary, however, development costs for GIRO and banks must be assessed, as well as the costs arising from changes in liquidity management by banks and consumer-side demand for such a service.

Box 4

Instant credit transfer systems in Europe

A key element in the operation of instant credit transfer systems is that the transferred amount is made available to the payee and the settlement is performed between payment service providers at a separate time. Once the payer has initiated the credit transfer, the transferred amount is shortly received by the payee, sometimes in a matter of seconds, and the credited amount can be immediately used by the payee for other payments. As the amount is immediately credited to the payee's account, payment service providers do not need to undertake guarantees within the system, as used in payment card payments. Payment service providers subsequently settle any outstanding amounts at a later time, even using the current intraday clearing systems. This gives rise to credit risk within the system, which can be duly managed by restricting the transaction amounts and setting aside liquidity in advance, or applying a strict collateral system.

Instant credit transfer systems have been deployed in several countries in Europe: the first of these was the Faster Payments Service in the United Kingdom. The Faster Payments Service, rolled out on 27 May 2008, was one of the largest payments developments in recent decades in the United Kingdom, and allows customers to make payments by telephone or on the internet 24 hours a day received almost instantaneously by the payee. Faster Payments can be primarily used for retail transactions within payment systems, with transaction value limits ranging from GBP 10,000 to 100,000 (HUF 3.7 to 37 million) depending on the bank. Single instant payments, standing orders and value dated payments, as well as bulk payments of corporate customers can be made via the Faster Payments system. Faster Payments is currently a premium service in essence, available at the ten largest British financial institutions. Based on the services of the system, a mobile payment service was launched in April 2014 allowing clients to make transfers from practically anywhere with their mobile device, using mobile telephone number based identification.

The Polish instant credit transfer system, Express ELIXIR, was launched in June 2012 and is operated by the Polish clearing house KIR SA. Transfers under the PLN 100,000 value limit (HUF 7.4 million) can be made via the system, a limit which may be further lowered by payment service providers. Sweden introduced its instant credit transfer system in late 2012, developed by Bankgirot in cooperation with the Swedish central bank. Various payment services can be linked to the system, with the Swish mobile payment solution being the first associated service, owned by six Swedish banks. The new payment solution allows customers to make immediate payments between accounts using a mobile device. Each bank defines its own charges for the Swish service, with transaction fees typically being around SEK 1-2 (HUF 35-70). The number of transactions processed within the system has been rising slowly but steadily after a more dynamic initial upswing. The instant credit transfer system is open to all payment service providers meeting the accession criteria. An instant credit transfer service is scheduled to be introduced in Denmark in 2014.

5.2 Introduction of the forint into the Continuous Linked Clearing and Settlement model

The Continuous Linked Settlement (CLS) model eliminates foreign exchange settlement risk, and thus by introducing the forint into the CLS system, the stability of the domestic financial intermediary system may further increase. The MNB pays special attention to the regular assessment and mitigation of risks affecting payments. In this spirit, the central bank twice performed an analysis based on the methodology of the Bank for International Settlements (BIS) to survey the domestic methods of managing foreign exchange settlement risks. The most important lesson from the surveys was that the level at which the settlement risk is perceived is not sufficient; therefore, the MNB and the supervisory authority must encourage banks to improve their risk management methods and measuring procedures. In light of all these results and in search for a solution to the difficulties seen in the financial crisis of the past years, the possibility of introducing the forint into the CLS system arose several times. The system connects the two parties to the foreign exchange transaction within the framework of a Payment-versus-Payment (PvP) mechanism, and thus eliminates foreign exchange settlement risk.⁴⁷ Currently 17 currencies from all over the world can be cleared in CLS and according to estimates, 68 per cent of the foreign exchange transactions concluded in these currencies was settled through the CLS system. The relevance of the CLS mechanism is indicated by the fact that in its supervisory guidance published in February 2013, the Basel Committee on Banking Supervision⁴⁸ called on central banks and supervisory authorities to encourage the widespread use of such settlement methods.

Having considered the opinions of the banks and the domestic foreign exchange settlement risk exposures, the Financial Stability Board of the MNB issued a letter of intent for CLS Bank on performing the necessary preparations and will endeavour to introduce the forint into the CLS system. Prior to the decision, the MNB had several rounds of consultations with the largest players on the Hungarian foreign exchange market during which it obtained information on the banks' position

on the introduction of the forint and participation in the CLS clearing. The letter of intent issued by the Financial Stability Board for CLS Bank is not binding, while at the same time it is a necessary condition for the progress of the accession process. The diligence phase, which primarily involves the studying of the local legislation on payment systems by CLS, the analysis of the FX payments by CLS and the review of the operation, procedures and message types of VIBER, started with the sending out of the letter of intent. The diligence phase is followed by the implementation phase which includes resolving the tasks identified during diligence, the harmonisation of the operative tasks and the development and testing of VIBER. CLS and MNB plan to complete the diligence phase by the end of August 2014, and to finish the project by the middle of 2015. Based on all this, the foreign exchange transactions concluded in the second half of 2015 against the forint are expected to be settled free of FX settlement risk.

In addition to creating the CLS compatibility of central bank processes and systems, it is particularly important that participating banks prepare for the accession in their liquidity management and undertake the necessary developments. In order to facilitate a successful accession as soon as possible, the MNB is cooperating with the Hungarian Banking Association and the Hungarian Forex Association. This cooperation increases the transparency of the project for Hungarian banks and thus helps to ensure their active and supportive participation in the project. CLS offers two accession opportunities for the Hungarian market: direct and indirect memberships. Direct members are in a contractual relationship with CLS, they have their own accounts at CLS Bank and communicate with the clearing and settlement system directly. Direct members place the collateral for the foreign exchange transactions submitted to the system on CLS's cash accounts according to the rules of CLS and, depending on their individual risk rating, they may enjoy the advantages of the liquidity management tools provided by CLS. However, the condition for obtaining direct membership is that the given

⁴⁷ The publication titled *Report on Payment Systems 2013* includes further information on the advantages and operation of the system.

⁴⁸ Supervisory guidance for managing risks associated with the settlement of foreign exchange transactions (BIS, February 2013).

institution should become an owner of CLS Group Holdings AG through the purchase of shares. As opposed to this, indirect membership does not represent a contractual relationship with CLS since the institution that wishes to join this way has to build up the partnership with a direct member. The internal rules of their counterparties are applicable for indirect members so

they have to comply with the settlement deadlines and the fee schedule set by the direct member. Accordingly, during the selection of the accession method, primarily that fact has to be taken into account that out of the direct members providing intermediary services and the conditions raised by CLS which ones meet the expectations of the given institution the most.

Box 5

Liquidity management in the CLS system

CLS ensures the usability of the Payment-versus-Payment (PvP) procedure it applies between any two time zones of the world through strict pay-in and pay-out schedules and settlement that is connected to a set of conditions. Transactions submitted for a given day are always settled between 7:00 am and 9:00 am (CET) and the direct members of the CLS system receive a notification on the necessary pertaining collateral, i.e. the final individual multilateral net banking positions at 6:30 am. The notification sent by CLS includes by what time the direct participant must provide the collateral for the submitted transactions, along with the currency and the amount. In the case of the forint, due to the country risk rating, the collateral of the direct member has to arrive on the VIBER account of CLS between 7:00 am and 9:00 am, while in the case of other foreign exchanges with a more favourable country risk rating, the direct member is allowed to provide the necessary collateral by a later date (by 12:00 pm at the latest). The latter opportunity is derived from the fact that in the case of foreign exchanges with a more favourable rating, liquidity providers ensure that the temporary inadequate coverage arising in the given currency is bridged at the system level. Thus, it actually means a line of credit in the case of certain foreign currencies. It must also be emphasised that the balance of the multicurrency account of a direct member managed by CLS, where such balance equals the total value of the collaterals transferred to CLS's accounts managed in the concerned large-value payment systems, expressed in dollars and reduced according to CLS's risk management principles, cannot be negative at any point of time during the settlement. This means that a settlement member can only have inadequate coverage in a given foreign exchange if it has an offsetting balance in another currency at the same time.

Payments from the settlement performed by CLS can take place between the start of the settlement phase and the closure of the large-value payment system enabling the settlement of the given currency, so in the case of VIBER it is between 7:00 am and 6:00 pm. However, in the overwhelming majority of the cases, the process is expected to close by 12:00 pm at the latest. It also has to be mentioned that if the bank joins the CLS mechanism as an indirect member, the pay-in and pay-out deadlines defined for it may deviate from those defined by CLS since the direct member used as an accession point may require an individual liquidity management schedule. In a given case it may mean that the indirect member must already provide the adequate coverage for the clearing and settlement of its transactions on the day preceding the settlement.

5.3 Risks arising from the unregulated nature of virtual instruments usable for payment

The decentralised operation of bitcoin and similar virtual instruments significantly differs from that of the electronic payment instruments currently used by the economic agents, and the lack of supervision and oversight by authorities and of liability rules protecting consumers as well as consumer protection and indemnification rules considerably increases the risks related to the use of these instruments.

The virtual instruments usable for payment have typically appeared in the past few years, during the crisis, to provide an alternative to the legal instruments used in the execution of financial transactions, avoiding the banking system. It is a basic characteristic of these instruments that they can only be used electronically, they do not have issuers supervised by authorities. In order for the transactions to be valid, they have to be authenticated by the network of the given virtual instruments usable for payment i.e. execution of the transactions does not take place through systems supervised by central banks. Typically, the number of a given instrument is limited, it can be generated by virtual mining. This means that with an open source software that requires a large calculation capacity (today of industrial extent), anybody can create more and more units anonymously until the upper limit coded into the system is reached.

In the case of problems with access and the operation of the virtual instruments usable for payment as well as misconduct committed to the detriment of the owners, the participants of the system may suffer significant damages and typically the possibility of indemnification or the mitigation of damages is not ensured by legislation. As for traditional electronic payment instruments, the accounts holding the money electronically are managed by payment service providers, and their safe and legal operation is supervised and regularly checked by the authorities; thus the usability of the customers' electronically saved money is ensured. In the case of the bitcoin and the rest of the similarly operating virtual instruments usable for payment, there are no issuing and intermediary institutions operating in a regulated framework but the participants of the system create the virtual instrument usable for payment and they operate the recording of the clearing units along with the system that performs the execution of the transactions. Thus, if during the recording of the bitcoin or the execution of the transactions any problem

arose, there is no authority or market participant that would assume responsibility for the users' money placed into virtual instruments. In the case of transactions initiated by using electronic payment methods, transactions are executed in systems where typically the oversight activity of a central bank ensures the safe, efficient and legally compliant operation of the systems performing the clearing and settlement of the payment transactions. Due to this, transactions are executed within the required time limits, in the method prescribed by legal regulations and safely. As opposed to this, the system enabling the exchange of bitcoins operates without central parties, where transactions are executed using the resources provided jointly by the participants of the system, and the final approval of the execution of the transactions is based on the confirmation of the system participants. Due to this, no institution guarantees the execution of the transactions for the owners of the virtual instruments usable for payment, nor do they compensate for any damages suffered by the customers. In addition, the requirements that define the rules of the execution of the payments and the protection of the customers in the case of electronic payment transactions do not apply to the trading systems that enable the exchange of the instruments.

In the case of virtual instruments, the owners face significant risks during the possession and usage of the instruments because of the lack of consumer protection, while the problems that arise from this may have a negative impact on the traditional electronic payment instruments on the long run. Traditionally, the users of the electronic payment solutions are protected by several legal provisions from the negative consequences of any misconduct and the interruptions occurring during the operation of the payment service providers and the payment systems. Among others, in the case of unauthorised access to the funds electronically stored in the systems of the payment service providers and the execution of transactions not approved by the customers, if the abuse did not take place because of the customer's fault, the service provider shall restore the account's original state thus protecting customers from the negative impacts of misconduct. However, the owners of bitcoins or the rest of the virtual instruments that are usable for payment may fall victim to misconduct in several ways. Misconduct may occur when

unauthorised persons gain access to the wallet on the owner's computer and transfer the bitcoin that is stored there to another account, or even when unauthorised parties access the owner's bitcoins by hacking the system of an electronic trading place that provides bitcoin wallet services. In such cases, the owners are not insured against the losses they have suffered, and thus they have to bear all the losses. In addition, in the case of purchases made with electronic payment instruments, both the payer and the payee are protected by rules with which it can be ensured that buyers really pay the value of the goods they purchased and the services they used and that the value of the goods sold really reaches the merchants. If the payment provider did not charge the appropriate amount to the payer's

account, the transaction can be reversed in certain cases and thus the customer will not suffer any losses, either. In the case of the bitcoin, there are no similar consumer protection rules, thus in a payment transaction neither the buyer, nor the merchant can be sure that the payment transaction will take place according to the contract. Both the seller and the buyer have to assume a significant exchange rate risk since in the case of the bitcoin, a significant change was observed in the exchange rate in the past period. As a result of this, the price of the purchased goods or services expressed in a real payment instrument at the time of the purchase can only be established with greater uncertainty.

Box 6

Purchases through the Internet with bitcoin and debit cards

In the short term, payment with bitcoins can primarily appear in purchases made through the Internet where, out of the traditional payment solutions, currently bankcard payments can represent the most efficient electronic payment method. Thus, it is expedient to compare the major characteristics of these two solutions (Table 6).

Table 6
Differences between purchases made on the Internet by debit cards and bitcoins

	Bitcoin	Debit card
How can one acquire amounts usable for payment?	– by virtual mining – by purchasing against legal tender – by accepting as counter value of goods or services	– by credit transfer or cash deposit to payment account – by accepting as counter value of goods or services
Where are the amounts usable for payments stored?	in a virtual wallet on the user's own computer or at a wallet service provider not supervised by authorities	on a payment account operated by a payment service provider supervised by the competent authority
Who is the issuer of the payment instrument?	There is no central issuer, it can be acquired by virtual mining or on trading platforms	A payment card linked to a payment account is issued by the payment service providers operating the payment account.
What are the security features to reduce the chances of fraud?	It is necessary to enter the security code ensuring access to the virtual wallet to initiate transactions.	In a growing number of cases is necessary to enter other information or a one-time password beside the data found on the card.
How are the transactions executed?	At the moment of payment the change of bitcoin between the virtual wallets is realized. Afterwards each bitcoin-transaction must be confirmed by the bitcoin network to be valid. In case of multiple spending of the same Bitcoin the transaction recognized at the first time by the majority of the network will be the final one.	At the moment of payment the merchant gets a confirmation from the card issuing payment service provider about the availability of the funds. On the payment account of the cardholder and the amount used is blocked on the payment account of the cardholder. Afterwards the merchant receives the amount of the transaction in a few days through the card settlement system overseen by the central bank.
How is the loss of the participants in the transaction limited in the case of a system failure or fraud?	The bitcoin-holder bears all the losses, at most it is possible to reduce the loss only in judicial procedure.	Rules of liability and allocation of losses laid down by law, supervision and oversight activity ensure to minimize the losses of the stakeholders.

5.4 Developments related to mobile payments

In past years, due to the rapid technical progress observed in the area of mobile phones and other portable communication devices, the options to use mobile devices have increased significantly which may incentivise the development of electronic payment services. According to the 2012 survey of the MNB, 89 per cent of those aged between 15-69 years have mobile phones which significantly exceeds the ratio of those holding payment accounts or payment cards. Additionally, based on the statistical data published by the National Media and Infocommunications Authority, the number of mobile internet subscriptions approached 3.2 million at the end of 2012. All solutions where the payment order is given through a mobile device can be listed under mobile payment services except for the cases when Internet banking services are used on the device through a browser.⁴⁹ Currently, several development paths can be seen for mobile payment solutions all over the world, a significant number of market participants are experimenting with various technical solutions and business models but so far only a few services managed to reach a larger number of customers. Mobile payment solutions can be grouped based on several aspects. In the case of payment situations, there are examples for proximity and remote payments. Mobile payment services cannot be considered as independent, new payment methods because typically, the services that enable the initiation of orders through a mobile device are based on an already operating payment method. Basically, there are three development paths in this area solutions based on payment card systems, credit transfer-based services and solutions based on mobile purchases. While in the case of the first two, the transaction is debited to the payer's payment account held at the payment service provider, in the case of a mobile purchase, the customer initiates the payment to the debit of the mobile phone account held at the mobile service provider. The replacement of the traditional financial intermediary system may be a goal for mobile payment developments, primarily in developing countries, along with the provision of supplementary services, mainly in countries with a more developed financial culture, and financial inclusion. Mobile devices can also gain space in the area of the acceptance of electronic payment transactions either by replacing traditional POS terminals in the case of payment card transactions, or in the case of other payment

methods, by conveying the confirmation of the execution of the transaction to the beneficiary.

The newly appearing mobile payment services can only support the improvement of the efficiency of local payment system if they become widely available and usable. To this end, it is useful to establish mobile payment services using the already existing and operating payment infrastructure, as a supplement thereto. The necessary additional infrastructural elements have to be established in a way where the costs of their installation and operation are low and access is available for all affected participants. As part of the developments, the situation should be avoided in which some of the solutions and their participants compete with each other in the area of access to infrastructure by creating either technical or regulatory elements that limit access. Owing to the mobile devices, the costs of the construction and operation of the infrastructure necessary for the execution of electronic payments may become lower. With these devices, extra services and information can be provided for the customers with which the financial awareness of those using the services and trust in the electronic payment instruments can be increased. The spread and usability of the services may support financial inclusion. However, the safe execution of the payment transactions and the appropriate management of the customers' personal data always have to be borne in mind.

In order to spread mobile payment developments in Hungary on a wide scale, market participants should cooperate intensively and extensively. Recently, several mobile payment developments have been realised in Hungary and some of these operate with the usage of payment card systems, where access and the possibility of the wide-ranging use of the system are enabled by a payment card-based identification. In addition, several credit transfer-based services appeared on the market which typically enable the identification of the payees based on mobile phone numbers. In such cases, however, the spread of these services may be slowed down by the fact that by using the phone numbers, the simple and quick execution of the transactions is only possible between the customers of the operator bank. When the payee of the credit transfer is the customer of another payment service provider, further

⁴⁹ In such a case, by using mobile devices, users give a payment (e.g. credit transfer) order or enquire account information through Internet banking services.

identification may be necessary. In the case of credit transfer-based mobile payment services, the establishment of wide-ranging usability may be promoted by the central recording of the mobile phone numbers where registered customers may

connect their phone numbers with their payment accounts and they can accept credit transfers by giving their phone numbers. The central records can be kept even by the GIRO which operates the ICS.

Glossary

4-hour rule	Pursuant to MNB Decree 15/2010. (X. 12.), starting from 1 July 2012, in accordance with the so-called '4-hour rule', 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.
ATM (Automated Teller Machine)	Automated Teller Machine through which cash withdrawals as well as other transactions (e.g. credit transfers) can be executed using payment cards.
Interchange fee	A fee calculated as proportion of the purchase price and paid by the acquiring payment service provider to the issuer in respect of purchases made with payment cards.
BSE	Budapest Stock Exchange Ltd.
BÉTa	Multilateral trading facility (MTF) operated by the BSE, as a platform for trading foreign stocks in Hungarian forints. The stocks purchased in the BÉTa market are identical with the stocks listed on foreign stock exchanges.
ICS	Interbank Clearing System, a deferred time gross clearing system operated by GIRO Zrt., offering two types of clearing: overnight clearing and, since 2 July 2012, intraday clearing.
Blue-chip stocks	The most liquid and most traded stocks in a market.
CEEGEX	Central Eastern European Gas Exchange
CLS (Continuous Linked Settlement)	A clearing and settlement model facilitating the elimination of FX settlement risk relying on a multi-currency PvP mechanism. The CLS is operated by the CLS Bank.
CSDR	Regulation on improving securities settlement in the European Union and on central securities depositories
Chip migration	The equipping of payment cards bearing only a magnetic stripe with chips, and simultaneously the enabling of devices handling payment cards to accept chip cards.
DvP	Delivery Versus Payment. The settlement method which links the cash and securities legs of orders for the settlement of securities transactions; it assures that the settlement of securities leg occurs only after the settlement of cash leg has been completed, or conversely, the settlement of cash leg occurs only if the securities are available and settlement is assured.
EBPP	Electronic Bill Presentment and Payment
ECC	European Commodity Clearing AG, a Leipzig-based clearing house acting as a central counterparty mainly for clearing in the energy market.

Individual guarantee elements	Collateral required by net clearing systems, which are part of the guarantee system and can be used only if the clearing member providing the security fails to settle (in case of the KELER CCP: basic financial collateral, variation margin, initial margin, additional financial collateral, liquidity FX security deposit).
Acquirer (payment card)	The payment service provider that the merchant accepting payment for purchases by payment card enters into an agreement to execute transactions. In the course of the clearing and settlement of transactions the acquirer collects and forwards to the merchant the value of card transactions.
Clearing	The acceptance, formal and substantive verification of orders followed by the calculation of the bilateral or multilateral liabilities of clearing members. Liabilities may be calculated on a gross or net basis.
Gross settlement	A clearing mechanism whereby only entirely funded transactions are cleared.
Net settlement	In the process of netting, the conversion of the payables and receivables of clearing members vis-à-vis one another into a single payable or receivable by deducting the receivables from the payables. Netting may be bilateral or multilateral. Then the net debit positions thus calculated are settled. If funds are insufficient, the guarantee system of net clearing must be activated.
Clearing and settlement risk	A delay or failure of clearing or settlement in the payment or securities clearing system, despite the fact that the clearing or settlement service is uninterrupted. The term 'clearing and settlement risk' is justified by the separation of the two phases (clearing and settlement) in some systems. Depending on the structure of the system, the realisation of clearing risk does not necessarily result in the failure of settlement and settlement risk may occur even if the clearing phase goes smoothly. Clearing and settlement risk may crystallise from the insufficient liquidity or insolvency or operational problems of participants.
Clearing house	The entity performing the processing, clearing and, in the absence of a settlement agent, settlement of transactions.
EMIR	Regulation on OTC derivative transactions, central counterparties and trade repositories
ESMA	European Securities and Markets Authority
EuroMTS	A multilateral trading platform mainly for secondary market trading in government bonds, where government bond series in excess of EUR 5 billion issued by most European countries are traded.
Payment system	In the case of the overseen systems, the form of cooperation based on the agreement between cooperating parties to run the system specified in point 18 of Chapter I of Annex 2 to the CIFE Act. Part of the financial infrastructure. It includes the different means of payment, bank procedures as well as interbank payment systems, which in combination facilitate the execution of payments.
Payment account	An account held in the name of one or more customers of a payment service provider which is used for the execution of payment transactions, including bank accounts.
GIRO	Giro Elszámolásforgalmi Ltd.

Third-party, external service provider	A party not directly involved in the process of clearing and settlement. Mostly performs communication services, supply of software and hardware, other support or outsourced services.
HHI (Herfindahl–Hirschman-index)	Indicator measuring market concentration, calculated by summing the squares of the percentage market shares held by the various market participants. Its value may be between 0 and 1. A value close to 0 means the absence of concentration, while 1 indicates a monopolistic market structure.
CIFE Act	Act CCXXXVII of 2013 on Credit Institutions and Financial Enterprises
Information asymmetry	A (decision) situation where one of the parties to a transaction has more, or more accurate, information than the other party. This upsets the balance of power between the parties and in the worst case scenario may lead to market failure.
Cooperative credit institutions operating with an integrated model	Cooperative credit institutions signing the ‘agreement on the integration of cooperative credit institutions’. They participate in the payment and settlement systems indirectly, through Magyar Takarékszövetkezeti Bank Zrt. as their correspondent bank and they execute their payment transactions through the correspondent bank.
Eligible collateral	The scope of collateral that the MNB accepts as cover for the secured credit transactions it enters into (including intraday credit lines). The types of eligible collateral are listed in the ‘Terms and Conditions of the Bank’s Operations in Hungarian Forint and Foreign Exchange Markets’.
System operational interdependency risk	It may arise if the various interdependent steps in the clearing and settlement process are performed by different service providers. The mostly liquidity related interdependencies of systems may give rise to contagion.
KELER	Központi Elszámolóház és Értéktár Zrt. (Central Clearing House and Depository Ltd.)
KELER KSZF	KELER KSZF Központi Szerződő Fél Zrt. (KELER KSZF Central Counterparty Ltd., or KELER CCP)
Trading	The mutual contractual agreement between trading members with the purpose of the sale and purchase of financial instruments. Settlement may be through physical delivery or cash settlement.
Post-trading infrastructure	The group of institutions performing clearing and settlement functions after the conclusion of a transaction.
Guarantee callable on first demand	For transactions guaranteed by KELER CCP, in addition to the protection offered by the individual and collective guarantee elements, KELER also provides a guarantee to KELER CCP up to a certain percentage of its capital. If in the course of the management of settlement fails KELER CCP needs, over and above the use of individual and collective guarantee elements, to resort to the guarantee callable on first demand, KELER is obliged to make available to KELER CCP funds up to the amount of the guarantee callable on first demand.
CGF	Collective Guarantee Fund
Issuer (payment card)	The payment service provider that makes the payment card available to the card holder and in the course of the settlement of transactions, forwards the value of the transactions to merchants through acquirers.

KID system	A system that ensures electronic communication between KELER and its clients.
Additional financial collateral	Surplus collateral required by KELER CCP from clearing members and power market non-clearing members for guaranteed capital market, gas market and power market transactions.
Settlement	Execution of payment and securities delivery obligations between system participants. Settlement occurs through accounting records on the accounts kept at the entity functioning as settlement agent.
Designating authority	The Magyar Nemzeti Bank pursuant to the SFA.
Designated system	The payment and settlement system which the Magyar Nemzeti Bank as the designating authority designates as being covered by the SFA as well as a system operated by the Magyar Nemzeti Bank pursuant to the provisions of the SFA.
Collective guarantee fund	Collateral required by net clearing systems, which is part of the guarantee system and can be used if any of the members of the risk community fail to fulfil their obligations. Its purpose is to reduce losses arising from transaction settlement fails and delays through a jointly owned guarantee fund.
Gridlock	Gridlock may emerge if orders submitted by one or a few participants in the payment or securities clearing system are not settled due to the lack of funds or securities. As a result, the orders of a number of other participants remain unsettled.
Batch processing	Simultaneous collective processing of items received at different points in time which are put in the same group if specific features are identical.
Central securities depository	Its main responsibility is the safekeeping of printed (physical) securities, the registration of immobilised or dematerialised securities (existing in the form of electronic signals) and the registration of the owners of securities by main account. Central securities depositories operate securities settlement systems, in which securities transactions are settled by book entries (that is, without physical movement of the securities).
Central counterparty	The central actor that interposes itself between the counterparties and guarantees the settlement of the transaction even if either party fails to fulfil its obligations.
Direct submitter	A customer who has an agreement with the clearing house exclusively for the direct submission to the clearing house of payment orders relating to its own economic management, pursuant to the authorisation of a direct participant and under a clearing arrangement with such participant, who is not considered a participant in the payment system.
Liquidity	The totality of financial instruments that can be used to settle orders in payment and settlement system.
Maximum usage of intraday credit lines	An indicator calculated for the usage of the central bank's intraday credit line which shows the maximum percentage used in a given business day for the settlement of orders.
MiFID, MiFIR	Markets in Financial Instruments Directive and Regulation
MNB	Magyar Nemzeti Bank (the central bank of Hungary).

MTF	Multilateral (alternative) Trading Facility.
MTS	The multilateral trading facility operated by EuroMTS.
Intraday credit line	Given sufficient collateral, the settlement agent (mostly the central bank) provides intraday credit lines to system participants to facilitate the prompt execution of the payment orders cleared in the system. The scope of eligible collateral is determined by the settlement agent. The credit line and the current account balance of participants together result the liquidity available as collateral for payment orders.
NFKP	Daily Natural Gas and Capacity Trading Market
FGS	Funding for Growth Scheme
OTC	Over the Counter market (including MTF and OTF platforms).
OTF	Organised Trading Facility
Payment service provider	A credit institution, institution issuing electronic money, institution operating the Postal Clearing Centre, payment institution, the MNB and the Treasury offering payment services.
PSA	Act LXXXV of 2009 on the Pursuit of the Business of Payment Services.
POS terminal	Devices facilitating the execution of payments by payment card (occasionally also the withdrawal of cash) in merchant locations. Information relating to the transactions is collected in electronic or paper formats; the former is the electronic POS (EFTPOS: Electronic Funds Transfer POS), the latter the imprinter.
PSD	Payment Services Directive, Directive 2007/64/EC on payment services in the internal market.
PvP	Payment versus Payment. Simultaneous execution of interbank and customers payment orders of two participants in a payment system, which assures that they are settled when and only when the other party has sufficient funds for the settlement and both orders can be settled.
Participant	An entity entitled to send orders to the payment or securities clearing system in its own name or on behalf of its customer. Participants can be direct or indirect, depending on whether they are connected on their own or through another participant.
Queue management	A central procedure whereby the system does not reject temporarily uncovered orders in the payment or securities clearing system, instead, they are put in a queue, then processed automatically when sufficient funds are available.
Optional reserve requirement ratio	Since the reserving period of November 2010, credit institutions subject to a reserve requirement have been able to choose their reserve requirement ratio. They can change their ratio twice a year (in April and October), and choose between rates of 2, 3, 4 and 5 per cent.

Risk of service continuity	The disruption or downtime of the clearing or settlement service in the payment or securities settlement system. This is generally attributable to some operational irregularity at the service provider or it may arise from its financing or commercial problems.
TEA	Exchange Settlement Fund
T2S (TARGET2-Securities)	Pan-European settlement infrastructure for the settlement of transactions in European securities markets.
Social cost	It includes the entire resource requirement of the payment chain, that is, the expenditures of all the participants in the payment chain excluding the fees paid by the parties to each other within the chain.
Performance:	See under settlement.
Settlement agent	An organisation that maintains the settlement accounts of the entities participating in the payment and securities settlement system and the account of the central counterparty, providing the execution of orders and, if necessary, grants credit to an entity or the central counterparty for the purpose of facilitating settlement.
Capital position limit	Quantity of the open derivative positions which a clearing member or client may have as a percentage of equity. At KELER CCP the position limits are calculated by dividing the initial margin requirement calculated by KELER CCP by the equity.
SFA Act	Act XXIII of 2003 on Settlement Finality in Payment and Securities Settlement Systems.
Customer payments	Payment orders generated by customers of system participants.
VIBER	Real time gross settlement system, a payment system primarily for the purpose of settling large-value and time critical transactions. Clearing and settlement occurs in real time, upon the verification of cover (gross settlement), in a single step. If in the course of the processing immediately following the submission of the transaction there are sufficient funds available, the order is executed finally and irrevocably.

King Louis I ('the Great')

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

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

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

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

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

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

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

PAYMENT SYSTEMS REPORT

2014

Print: Prospektus–SPL consortium

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