

László Bodnár, Miklós Luspay and Annamária Madarász: The effect on payments of the conversion of MNB bills into deposits*

In April 2014, a decision was made at the central bank to convert the two-week MNB bills into deposits as of August 2014 with the objective of “channelling HUF liquidity from the two-week MNB bills to government securities”.¹ This also means that this short-term instrument is removed from the pool of eligible collateral accepted by the MNB, and thus credit institutions will no longer be able to use it for the execution of payment transactions; i.e. as collateral for fulfilling their clients’ payment orders. Since the two-week MNB bill comprises the bulk (nearly 40 per cent) of the securities pledged by banks as collateral, the central bank decision will definitely require some adjustment on the part of credit institutions if they wish to maintain the level of liquidity previously available for them in the payment systems. In our paper, we examine the possible adjustments of banking sector participants in response to the conversion of the MNB bill into deposits in terms of liquidity and, based on historical data, we attempt to analyse the impact on credit institutions resulting from the removal of the MNB bill from the pool of eligible collateral.

LIQUIDITY

Components of liquidity: account balance and overdraft facility

In Hungary, credit institutions basically use two payment systems to execute their payments and the payment orders of their clients. The real-time gross settlement system (VIBER or Hungarian RTGS) is used for high-value, urgent forint transfers, while the Interbank Clearing System (ICS) is used for small-value forint transfers. In the settlement of VIBER transactions, collateral is secured on a gross basis; in other words, the bank involved must provide collateral for the entire outgoing transaction. In addition to high-value, time-critical transactions, the intraday turnover of the ICS is also cleared in VIBER, along with those transactions of night-time turnover, which are settled in an extraordinary settlement cycle due to the queuing of items lacking coverage. Furthermore, VIBER is also used for settling the cash leg of credit institutions’ securities transactions executed in the securities clearing and settlement system operated by the Central Clearing House and Depository (KELER) Group.

Credit institutions must have sufficient liquidity so that they can execute their payment orders in VIBER. This liquidity is ensured by the account money (account balance) held on

their accounts with the MNB and by the overdraft facility provided to them. Payments are executed primarily by utilising the account balance of the VIBER participant. The account balance is affected by several factors, including the required reserve ratio chosen by the credit institution. Multiplying the required reserve ratio – which can be freely chosen between 2 per cent and 5 per cent – by the reserve base of the credit institution gives the reserve requirement. This is the minimum amount that must be held by the specific credit institution on its MNB account. Banks must meet this mandatory minimum as a monthly average; i.e. they must ensure that the average of their end-of-day closing balances reaches this statutory minimum in the given month. Hence this mechanism provides banks with a certain flexibility in a sense that they have more freedom in determining their account balances (and therefore the liquidity available for their payment transactions) over the course of a given month. Some banks, for example, hold a higher account balance than their selected reserve ratio (i.e. run a reserve surplus) at the beginning of the month, and adjust this surplus in the second half of the month (run a reserve deficit). Obviously, these behaviours affect banks’ liquidity as well.

If a bank has insufficient funds on its MNB account to execute its payments, it may automatically obtain an intraday credit line (overdraft). In such cases, the bank’s most important task

* The views expressed in this article are those of the author(s) and do not necessarily reflect the official view of the Magyar Nemzeti Bank.

¹ http://english.mnb.hu/Root/Dokumentumtar/ENMNB/Sajtoszoba/mnben_sajtokozlemlenyek/Banks_can_contribute_to_Hungary_s_self-financing_through_government_security_purchases_-_Background_material.pdf

is to settle the overdraft by the end of the day; otherwise it will become an overnight loan. And while the intraday credit line is practically free of charge with its price effectively being the opportunity cost of the pledged collateral, overnight loans are more expensive, and the bank in question incurs extra costs.

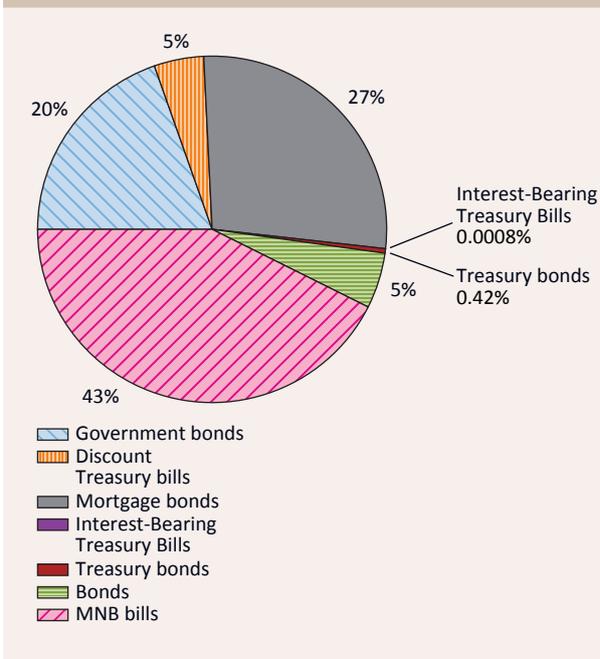
Banks may modify the available overdraft – and increase the level provided they still have sufficient amount of securities in their balance sheets to pledge – during the daytime VIBER business hours or, after the closure of VIBER, until 6:30 p.m. under normal business circumstances. Banks must initiate the modification of the overdraft facility with KELER – where the security register is maintained – and, following the verification of the securities side, KELER forwards the request to the MNB. This, however, is a time-consuming process, as the request for modification must run through the systems of both KELER and the MNB, which takes an average of 5 minutes per security type. This is particularly important when a VIBER member wishes to pledge different types of securities as the relevant processing takes place consecutively rather than concurrently, for each individual security type; consequently, the 5-minute lead time could in fact take much longer. Banks should bear this in mind especially if they are more overstretched from a liquidity management perspective. Still, by means of this mechanism, banks have an opportunity to supplement the liquidity needed for the execution of their daily turnover during the course of the business day if they have failed to estimate the required level of liquidity correctly.

If a bank does not have sufficient coverage – based on its account balance and overdraft facility – to execute a certain transaction, VIBER will place the payment orders in a queue. Verification of coverage takes place after the submission of financial transactions. During such verification, both the account balance and the intraday credit line are examined and checked whether these provide adequate amount of coverage for the execution of financial transactions. A bank may encounter a problem when liquidity management is unable to secure this coverage for the outgoing transaction during the clearing process, and thus the item is not settled immediately. In such cases, VIBER places the items in a queue. The order of these queued items can be modified by the VIBER participant though and as soon as the required coverage is available, the system begins to settle the items. If VIBER perceives a gridlock, it activates the automated gridlock resolution mechanism. Due to the complexity of the system, however, participants may be subject to network effects; i.e. if a credit institution fails to execute a transaction/transactions in time, the payments of another credit institution may also be subject to disruptions.

Main features of the overdraft facility and its collateral, the pledged securities

Coverage for the overdraft is provided by the securities pledged to the MNB. However, it is important to distinguish between the total pledged portfolio and the portfolio which can actually be used as coverage for the overdraft facility available for payment transactions. As a matter of fact, the pledged portfolio serves as collateral not only for the overdraft but also, among others, for the monetary loans provided by the MNB and for a part of the loans disbursed under the Funding for Growth Scheme (FGS). In other words, the pledged portfolio is the full (hence, broader) set, and its subset provides actual coverage for the intraday overdraft facility. Various (eligible) securities can serve as central bank collateral, such as government securities of a suitable grade, mortgage bonds and MNB bills. As Chart 1 indicates, the MNB bill currently plays a crucial role in the composition of the security portfolio pledged by the banking sector at the aggregate level. In certain cases, the collateral pool may also include other items besides securities, such as loans disbursed under the FGS. These items, however, are disregarded for the purposes of our paper, which focuses solely on securities.

Chart 1
Pool of currently eligible collateral by security type
(January 2013 – March 2014, average values calculated based on daily data)



Securities pledged in favour of the MNB are accepted at a pre-determined discount price. For example, if a participant wishes to apply for a loan of 100 units, it will need to pledge

securities of 100 + x units in order to avoid potential risks. The difference between these two (i.e. the “x”) is referred to as haircut. It is also important to note that the Hungarian collateral management practice works on a consolidated (“pool”) basis, which means all eligible securities accepted by the MNB are pooled into a single portfolio and banks may take out a loan against this collateral; in other words, the pledged securities are not labelled separately based on what they have been used for. An important condition from the central bank’s point of view is that the total value of collateral pool should reach the required total collateral value.

By determining the pool of eligible collateral the central bank can regulate and influence banks’ liquidity. In response to the crisis of 2008, the central bank expanded the scope of eligible collateral by accepting, among others, mortgage bonds and municipal bonds, providing further support for banks’ liquidity management. The pool of eligible collateral has not recently been affected by any significant changes except for the aforementioned municipal bonds, which were removed from the pool of eligible collateral at the end of February 2014 after the state took over their financing. This, however, had no significant impact, given that only two banks pledged notable amounts of such bonds. Moreover, these two members were prepared for the phasing-out of these bonds and were able to substitute them by pledging other securities.

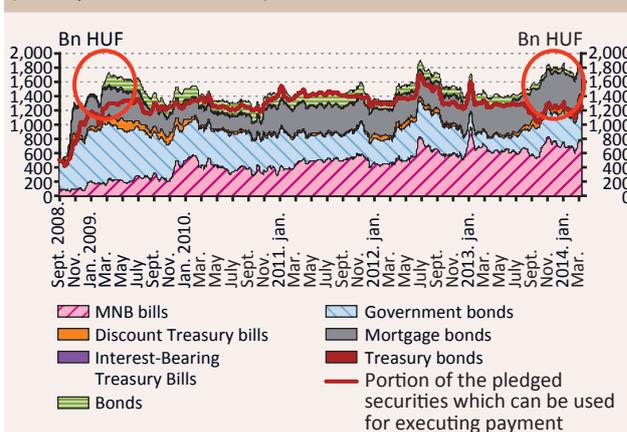
Impact of the 2008 crisis and the Funding for Growth Scheme on the liquidity of the payment systems

Banks’ failure to access sufficient liquidity for the execution of their payments may have a significant liquidity effect, including spillover to other participants. Since the entire payment system operates as a coherent network, even one participant’s failure to fulfil its payment obligations might have a ripple effect through the entire market. The central bank faced this threat during the crisis in 2008. The global recession substantially transformed banks’ liquidity management habits in Hungary. Confidence in interbank markets was shaken and lending practically halted, which hindered banks in obtaining the intraday liquidity required for the execution of their payment orders. In response, banks raised their pledged collateral levels and their account balances. Owing to the fact that account balances increased above the reserve requirement, banks accumulated a substantial overnight deposit portfolio during the same period.

Following the crisis, pledged security holdings, and within this the ratio of MNB bills in particular, increased substantially both at the aggregate and individual bank level. At the aggregate level, the pledged amount of collateral, which was

typically at around HUF 500 billion in September 2008, tripled and rose to an average HUF 1,400–1,800 billion by the end of the period under review (Chart 2). In particular, the ratio of two-week MNB bills rose quite sharply within the pledged portfolio: by the beginning of 2014 it had shifted to 40–45 per cent from the 10–20 per cent level typically seen in 2008–2009. This is no accident as government transactions following the 2008 crisis (disbursement of IMF loan) substantially increased central bank foreign currency reserves. The public sector expenditures financed from the state’s borrowings generated growth in the banks’ account balances and hence in the liquidity of the banking sector. Banks then deposited this increased liquidity with the central bank in the form of MNB bills. It is apparent that systemic level liquidity and the level of the two-week bill portfolio move roughly in tandem.

Chart 2
Changes in pledged amount of collateral by security type
(January 2008 – March 2014)



Note: 10-day moving average.

As a reaction to the 2008 crisis, individual credit institutions paid far more attention to their liquidity management. Along with raising their MNB bill portfolios pledged to the central bank, they also significantly increased the intraday credit line available for them. In September 2008 the aggregate amount of intraday credit line was around HUF 500 billion. By mid-2009 this had increased to an average HUF 1,300–1,500 billion, which banks have been working to maintain ever since.

In the second half of 2013, an increasing portion of pledged securities was used as collateral for loans granted under the Funding for Growth Scheme (FGS), and hence the share of the overdraft facility available for payment purposes gradually declined within the total pledged portfolio. Trends in the intraday credit line and its collateral, the pledged securities, have been continuously changing since 2008 (Chart 2). In 2008–2009, the overdraft facility comprised 80 per cent of the pledged portfolio on average. This indicates that, besides the overdraft facility for payments, banks may have

pledged securities for other reasons as well, such as recourse to other central bank loans. In subsequent years, however, no significant difference could be observed between the total pledged portfolio and the credit line available for payment purposes, with the latter accounting for nearly 100 per cent of the pledged security portfolio. This trend lasted up until the introduction of the FGS in mid-2013. Credit institutions may take recourse to the MNB's fiscal stimulus package only against the coverage provided by eligible securities accepted by the MNB. In the second half of 2013 – since an increasing part of security holdings was used as collateral for loans granted under the FGS – the share of the overdraft facility available for payment purposes declined gradually within the total pledged portfolio. While 90–95 per cent of the pledged collateral was actually available for payment purposes in the first half of the year, by the second half of the year this rate dropped to 60–65 per cent following the introduction of the FGS. In order to maintain the earlier level of liquidity, from August 2013 onwards banks started increasing their pledged security levels, primarily by pledging discounted treasury bills and government bonds. If banks continue to actively borrow FGS loans, payments participants are expected to pledge further securities if they are to maintain the level of their liquidity. Consequently, the gap between the overdraft facility and the security portfolio is likely to open up further in the coming period.

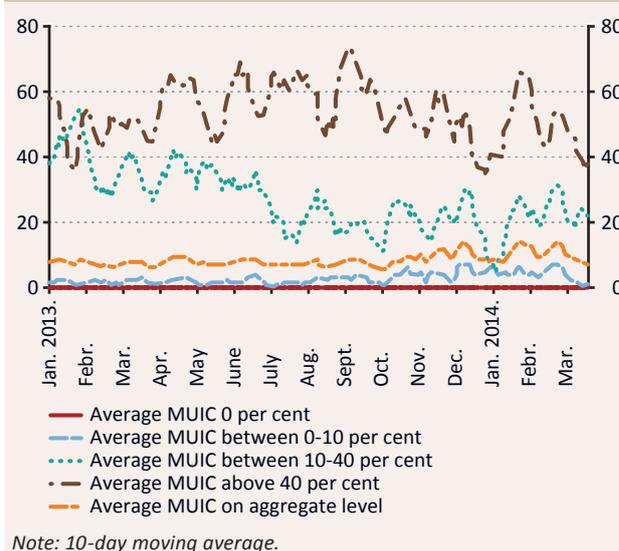
Utilisation of credit line: aggregate versus individual level

Despite the increase observed at the beginning of 2014, the utilisation of the credit line remains low at the systemic level. Previously, we described the recent increase in total pledged securities and thus the available intraday credit line (overdraft) at the aggregate level. The absolute size of the overdraft, however, does not tell much about its “necessity” in itself. The extent to which individual credit institutions utilise the credit line is also important to understand, as this is the information that demonstrates the level of excess liquidity actually available in the banking sector. The utilisation of the credit line is measured by the maximum usage of intraday credit line indicator (MUIC), which compares the lowest intraday account balance (largest negative account balance) of a credit institution to the total available credit line.² On the one hand, the utilisation of the credit line depends on the size of the pledged security portfolio available for the payment transactions of the credit institution, and on the other hand, it also depends on the proportion of payment transactions executed from the account balance and from the intraday

credit line. Several VIBER participants do not take recourse to the credit line for the execution of payments, or their use of the credit line is very limited. The utilisation of the credit line remains low in the banking system as a whole. Its level is only at around 14 per cent, although there was a slight increase by the end of 2013 and early 2014 compared to the prior year's similar data. One reason for the slight increase may have been the launch of the FGS as it led to a decline in the pledged amount of securities available for payment transactions, which simultaneously increased the degree of utilisation (Chart 3).

Chart 3
Time series of maximum credit line utilisation at the systemic level and for groups formed on the basis of the average MUIC values of individual banks

(January 2013 – March 2014)



There are marked differences between banks in respect of credit line utilisation. In order to gain a deeper insight into individual banks' credit line utilisation habits, we need to examine their specific features. With this in mind, we divided VIBER members into four groups based on their average MUIC values (Chart 3). The first group included credit institutions which do not use the intraday credit line at all (average MUIC: 0 per cent). Banks belonging to this group typically have a smaller share (3 per cent) in total VIBER turnover (Chart 4, left-hand chart). The second group is composed of banks that use the credit line available for them, but only to a minimal extent. The average MUIC value of this group ranges between 0 and 10 per cent. On the one hand, this group includes banks with a negligible VIBER turnover, but on the other hand, it also includes banks whose payment turnover is higher in absolute

² For example, if the smallest account balance of a credit institution is +2 units on a given day with a 10-unit credit line, the MUIC will be 0, i.e. the credit line was not used. By contrast, if the lowest account balance of the credit institution is –3 for the day and its credit line remains 10 units, then the MUIC will be 30 per cent. In other words, the credit institution has used 30 per cent of its available credit line on that particular day.

value, but the substantial account balance they keep in order to comply with the reserve requirement provides sufficient coverage for most of their transactions. Thirdly, a smaller part of the group is composed of banks whose effective credit line utilisation is lower because they have significant pledged security holdings, and since the share of MNB bills in their portfolio is only 21 per cent, they are not expected to be hit hard by the conversion of the short-term instrument into deposits (Chart 4, right-hand chart). The share of banks belonging to this group in total turnover is 41 per cent. The average credit line utilisation of banks accounting for more than one half of VIBER turnover is higher than 10 per cent. These credit institutions make up the third and fourth groups. Banks with an average MUIC value of 10–40 per cent were placed in the third group. These banks account for 23 per cent of VIBER turnover. They include large retail banks with a massive payment turnover, which they can only partially finance using their high account balances. Since this group relies on the available credit line to a greater degree, the modification of the eligible collateral pool may require a more pronounced adjustment on their part. Participants belonging to this group rely heavily on the MNB bills; therefore credit institutions belonging to this group need to prepare even more carefully for the period when the MNB bill will not be available as collateral anymore (Chart 4, right-hand chart). Banks with an average MUIC value above 40 per cent were classified into the fourth group. This group represents 33 per cent of VIBER turnover. The credit line utilisation of banks in this group often exceeds 90 per cent. This group of banks typically includes active financial market participants with

a large corporate clientele. The conversion of the MNB bill into deposits is expected to require a significant adjustment on their part as well, considering that the two-week instrument comprises nearly 72 per cent of their pledged holdings. It is important to note, however, that the grouping described above considers only pledged securities and credit lines. Most banks still carry additional securities in their balance sheets to pledge; i.e. they have an option to increase their credit lines – and hence, their liquidity – further, which would reduce credit line utilisation.

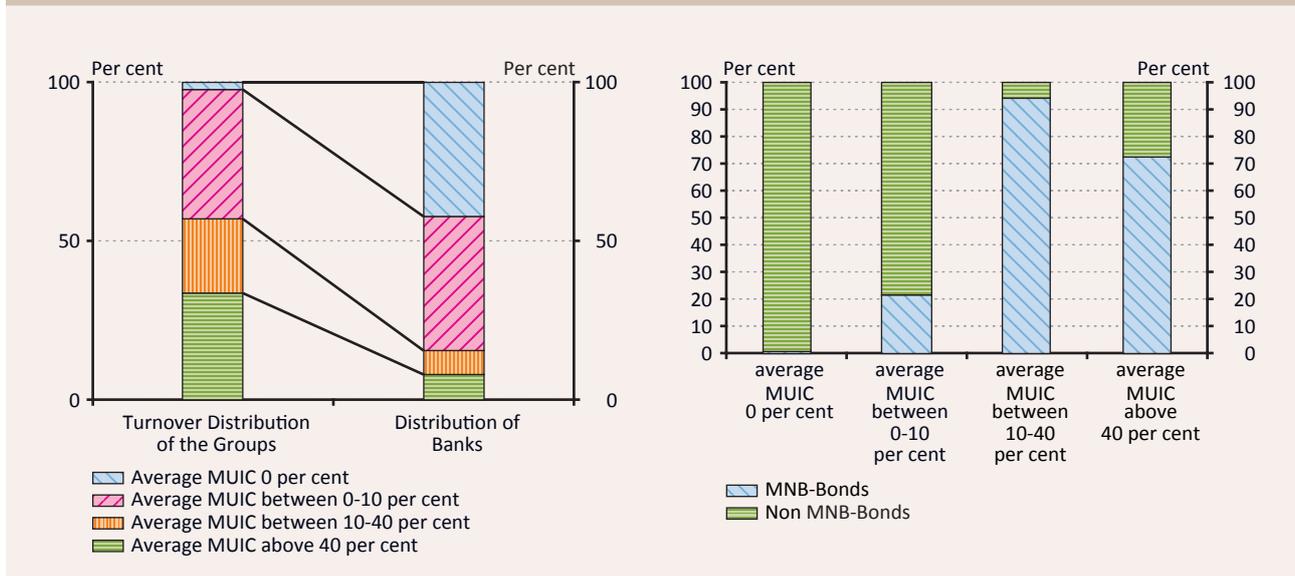
EXPECTED EFFECT ON PAYMENT AND SETTLEMENT SYSTEMS OF THE CONVERSION OF MNB BILLS INTO DEPOSITS

Adjustment

The conversion of the MNB bill will affect different banks to different degrees, with the impact basically depending on the share of MNB bills in the banks' pledged and pledgeable portfolio and also on their utilisation of the credit line available. Bearing these aspects in mind, several effects may be distinguished depending on how substantial the given bank's MNB bill portfolio was. It is possible that a bank used its intraday credit only to a negligible degree on a given business day, but if it was entirely composed of MNB bills, then the bank would not have been able to execute its payments without this instrument. In order to assess the minimum credit line requirement of a specific bank for the

Chart 4
Turnover distribution of the groups formulated on the basis of average MUIC values, supplemented by the distribution of bank percentages (left-hand chart) and the ratio of the MNB bill to the total pledged portfolio in each group (right-hand chart)

(January 2013 – March 2014)



execution of its payments, we must examine what trend the payment transactions would have shown in the past one and a half years without the MNB bills in the pledged portfolio. By removing the entire MNB bill portfolio we can estimate the degree of the required adjustment. For this exercise, we need to compare the lowest account balance (the largest negative account balance) to the pledged security portfolio available for the execution of payments and to the total security portfolio that can still be pledged (pledgeable amount of collateral). If the stock of pledged securities is insufficient on an individual bank basis to provide coverage for the largest negative balance once MNB bills have been removed, the new regulation will definitely require adjustment by the bank.

Bank-side adjustment can take place in different ways. If banks have additional securities in their balance sheets to pledge, they can further increase their liquidity by pledging them. If they do not have sufficient additionally available securities in their balance sheets to pledge then they still have several options for adjustment: they may purchase other securities, or increase their account balances and their central bank overnight deposit holdings, or they can change the timing of their outgoing payment transactions or use other liquidity management tools. In the following, we analyse these adjustment options. It is important to stress that the precise extent and method of adjustment may vary for individual banks both because of the differences between their MNB bond holdings and because of their different preferences and considerations, of which the execution of payments represents only one aspect.

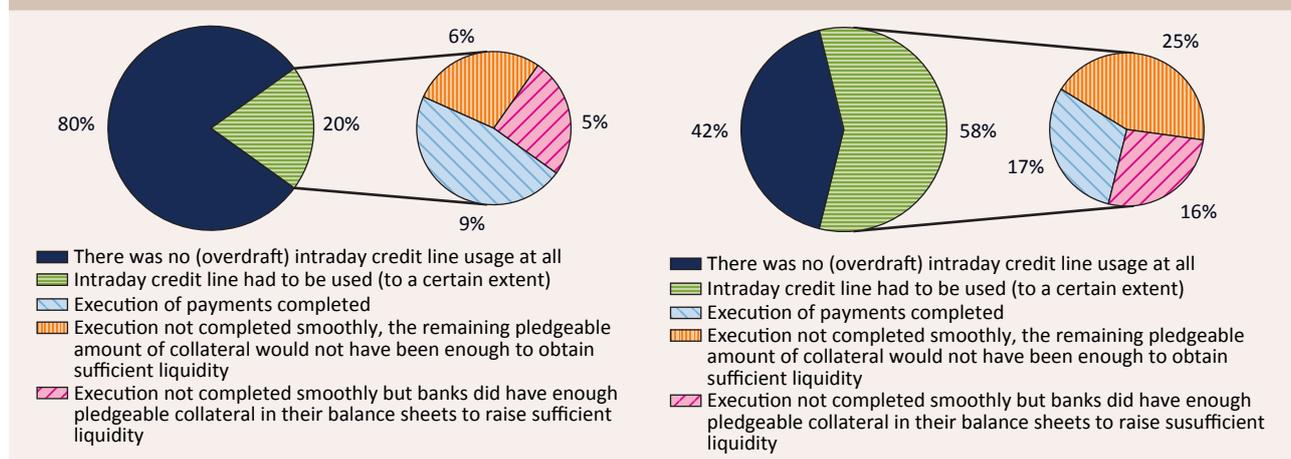
Analysis methodology and results

We examined different variables for 52 banks covering the period between January 2013 and March 2014, including the

lowest VIBER account balances, intraday credit line, pledged securities and securities additionally available for pledging (pledgeable amount of securities). Based on historical data and previous trends, we provided an estimate as to how liquidity management would have evolved in the area of payments without the pledged and additionally pledgeable MNB bills. We considered the effect of the conversion of MNB bills into deposits by assigning an adjusted market value of zero to these short-term instruments. Subsequently, we examined which banks on which days would have faced a problem in executing their historical payment transactions without the MNB bills. It is important to note that during our analysis the intraday – and not the end-of-day – liquidity management is examined, that is because end-of-day closed positions are irrelevant from the aspect of payments. What really matters is those “overstretched” or “stressful” intraday moments on a given business day when a bank has to use its liquidity quite heavily. Hence from the payments point of view, the maximum usage of intraday credit line matters the most since this indicator shows those risky situations, those “bottlenecks” when banks needed to have sufficient amount of liquidity.

In our impact assessment we applied a simplification, i.e. we assumed that banks pledged their entire MNB bill portfolio for payment purposes. This is a simplification because, as mentioned before, the pledged portfolio may well include securities pledged for purposes other than the execution of payments, for example, providing collateral for loans disbursed under the FGS. The phasing-out of MNB bills could only be presented realistically if we adjusted each individual day and credit institution by the current FGS loan portfolio. For the sake of simplicity, we have not made this adjustment; however, we assume that the adjustment would not alter our results significantly, given that several banks actively using the MNB bills do not even participate in the Funding for Growth Scheme.

Chart 5
Distribution of adjustment reactions in response to the removal of the MNB bill from the pool of eligible collateral in respect of case number (left-hand chart) and bank number (right-hand chart)
(January 2013 – March 2014)



In the observation period, we only took into account those banks and those days when the given participant had incoming or outgoing items (14,329 cases), and then further narrowed this down to those cases where the bank had to use its overdraft (intraday credit line) against its pledged securities in order to execute its payment transactions (2,854 cases).

In 89 per cent of the cases, the phasing-out of the MNB bill – which would affect 59 per cent of the banks – would not have required any adjustment at all. In 80 per cent of the cases, there would have been no need for adjustment since in these cases, no intraday credit line was used at all. In 9 per cent of the cases, although the intraday credit line was used to a certain extent, it would have been sufficient to execute the payments even without the MNB bills. In the period reviewed, 42 per cent of the banks (22 banks) did not use the available credit line at all. A total of 17 per cent (9 banks) used the overdraft facility at least once, but they had enough coverage for executing payments even without the MNB bills (Chart 5).

In 11 per cent of the cases, the phasing-out of MNB bills would have required a certain level of adjustment since without the MNB bills, the credit line available for the banks would not have been sufficient to execute the payment transactions, which would have affected a wide range – around 41 per cent – of the credit institutions. Cases (11%) when credit institutions would not have had enough pledged collateral without the MNB bills at their disposal to cover the intraday credits represented more than 50 per cent of all the cases when intraday credit lines were used to a certain extent. This means that in the period reviewed the MNB bill played a prominent role within the pledged security portfolio in securing the available credit line. Of all the banks, 41 per cent (21 banks) would not have been able to smoothly execute their payment transactions after the hypothetical removal of MNB bills from the pledged portfolio of securities. In other words, they would have had to make some adjustment in order to execute payments.

In nearly 5 per cent of the cases in the period under review, banks would have been able to obtain sufficient liquidity by pledging additionally available securities carried in their balance sheets, which would have been a possible alternative for 16 per cent of banks to replace the two-week instrument. In 47 per cent of all those cases when the execution of financial transactions would have been somewhat problematic due to the lack of liquidity, banks still would have had enough additionally pledgeable securities in their balance sheets – even without the MNB bills. By pledging these additional securities, the related credit institutions would have been able to increase their liquidity levels and thus obtaining an adequate amount of overdraft (intraday

credit line). Out of the 21 banks whose payments would have failed based on the credit line available without the MNB bills, less than one half (8 banks) would have been able to pledge further securities from their portfolios available to pledge.

Based on historical payment data, in 6 per cent of the cases, or 25 per cent of all the observed banks would not have had enough securities in their portfolios to pledge without the short-term instrument, forcing them to rely on a different adjustment method, such as the purchase of other securities or the depositing of overnight central bank deposits. In 53 per cent (798 observations) of all those cases when the execution of historical payment transactions would have failed without the MNB bills, there would not have been enough pledgeable collateral (other than MNB bills) in the banks' balance sheets to increase (overdraft) intraday credit and thus liquidity. In the period reviewed, 25 per cent of banks (13 credit institutions) had at least one day when their payments would not have been executed without disruption in the absence of the MNB bills. In other words, even the additionally available amount of pledgeable securities in the banks' balance sheets would have been insufficient to fulfil payment obligations.

It is noteworthy to mention that besides increasing the volume of pledged securities, changing the timing of financial transactions would, *ceteris paribus*, also help in executing payments. If a bank has an incoming item from another VIBER member, the financing effect of that item will have a positive impact on the bank's liquidity. In such a case, the bank's account balance is increased by the credit transactions, which may provide enough coverage to finance its outgoing items. Indeed, if a bank has to execute a high-value outgoing transaction and does not have sufficient liquidity to cover the item, it may wait until ingoing transactions increase its account balance and hence its liquidity, to execute the transaction at a later point in time. This attitude is manifested in banks' item timing behaviour. Altering timing behaviours, however, is an assumption that is difficult to model and generalise, and therefore we did not take this into consideration in our current analysis. Nevertheless, it can be clearly seen that upon the introduction of intraday clearing in ICS (GIRO), banks adjusted to the new situation by significantly altering the timing of their transactions (postponing them to a later part of the day), thereby securing sufficient coverage for their ICS transactions.

Another possible alternative is to raise the required reserve ratio, which would have provided sufficient room for manoeuvre for 9 banks of the 13 banks that would not have been able to pledge additional securities based on their balance sheets. One possible scenario is that banks may attempt to maintain their former liquidity levels in the future by raising their account balances above the reserve

requirement rather than sustaining the amount of pledged securities. The 9 banks would have been able to raise the required reserve ratio because they did not use the maximum 5 per cent value. Indeed, most of them only maintained the minimum 2 per cent level, so they clearly have room for an increase. Banks, however, may wish to manage the situation by excess liquidity higher than what is ensured by their required reserve ratio, which might increase their overnight central bank deposits. By doing so, they would practically rearrange the current proportions of their liquidity: the share of overnight facility would be reduced whereas in turn, the share of account balance would be increased.

Besides the adjustment options discussed so far, banks can improve their liquidity positions in several other ways.

They could also accommodate by obtaining liquidity from the foreign exchange market or from the interbank deposit market; i.e. they may borrow funds from banks that have excess liquidity at the moment. If a bank does not manage the shortage of coverage at all and allows its items to be placed in a queue, this could also be considered as a way of adjustment. Based on the experiences of recent years, however, this latter is a less likely scenario though, as banks continue to pay special attention to the execution of payment transactions.

Individual preferences and circumstances will determine the adjustment options that banks choose. Banks will select from the above listed liquidity-providing methods depending on what the prior best practices were, what options the bank in question currently has and how it assesses all these possible options/scenarios.

Security purchases and other effects

The conversion of the MNB bill into deposits affects 25 per cent of banks, and the extent of the adjustment largely depends on the level of liquidity which individual VIBER members are prepared to maintain. If we assume that banks wish to maintain the pledged security portfolio and the size of the credit line secured by it for payment purposes, this impact will be obviously more pronounced, affecting more cases and more banks. After the introduction of the FGS, when banks' liquidity and credit line available for payments decreased, banks responded by pledging additional securities in order to ensure the same level of the liquidity that they have maintained since the 2008 crisis. Based on this and assuming that they will continue to pursue their previous practice, banks are expected to maintain the current convenient level of intraday liquidity and find a way to replace the MNB bills with something else. This will most likely take the form of additional security purchases or stepping up their central bank overnight deposit portfolios.

Based on historical payments data, the banking sector's adjustment in response to the conversion of the MNB bill would have to amount to HUF 500 billion in order to ensure that payments are executed, with the backing of the previous level of sufficient, ample intraday liquidity, *ceteris paribus*.

This HUF 500 billion means that there was a day during the period under review when, in the absence of the MNB bills, at least this amount of credit line would have been needed, *ceteris paribus*, for the smooth execution of historical payment transactions. Out of this HUF 500 billion, on this particular day banks would have been able to obtain HUF 219 billion from the portfolio carried in their balance sheets available to pledge. The remaining HUF 281 billion, however, would have had to come from some other sources. Having said that, this HUF 500 billion is an extreme value as there was only one such case during the 15-month period reviewed. Looking at the entire period from the perspective of payments, *ceteris paribus*, MNB bills would have been missing in the amount of HUF 121 billion in the system on average, of which banks would have been unable to provide replacement securities worth HUF 85 billion based on their pledgeable amount of securities. This average adjustment pressure of HUF 85 billion demonstrates that the banking sector would have needed this amount of additional liquidity to successfully manage its historical payment turnover. This value, however, indicates only the average additional liquidity needs. If banks wish to further maintain the high levels of pledged securities – which they have done consistently since 2008 – the banking sector as a whole will have to replace MNB bills worth HUF 670 billion on average in order to achieve the previous payment turnover with the same conditions.

Other effects expected in future – such as the expansion of the FGS – may modify our results significantly. The Funding for Growth Scheme is being expanded continuously, which implies steadily increasing collateral needs for the loans provided under the scheme. This reduces the credit line available for payments even further. Increasing FGS disbursements will only exacerbate the adjustment pressure arising from the conversion of the MNB bill into deposits. However the exact effect of this cannot be calculated as yet, as it depends on various factors, such as the size of the loans disbursed, the type of the selected collateral, and other adjustment methods.

SUMMARY

Our paper analyses the effect of the removal of the MNB bill from the pool of eligible collateral and the possible adjustment reactions. In order to fulfil its payment obligations, a credit institution must have a sufficient level of liquidity (account balance and credit line) at its disposal. Coverage for the credit line is secured by the security portfolio pledged to the

central bank. It was seen that, at an aggregate level, the MNB bill accounts for a substantial part of the pledged security portfolio, and it has become a crucial instrument in recent years in respect of liquidity management. Individual bank characteristics show significant differences in terms of the fulfilment of payment obligations: some banks are capable of financing outgoing items using solely their account balances, while others also rely on their intraday credit lines.

In order to obtain a precise view on the impact of the MNB bill's removal, we identified the number of cases when the execution of payment transactions would have taken place smoothly without the MNB bills and also the number of cases when execution would have failed – based on historical data. Of all the banks observed, 16 per cent (8 banks) would have failed to fulfil their financial transactions, although by pledging other securities carried in their balance sheets they would have been able to obtain additional funds to increase their liquidity, which would have been sufficient to finance their outgoing items. This, however, was not an option for 25 per cent of banks (13 banks), which would have been forced to seek some other forms of adjustment. Owing to the phasing-out of the MNB bill, the banking sector would need an adjustment of HUF 500 billion overall, to ensure the execution of payment transactions on an individual bank basis.

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