

# Levente Habány and Dr. Anikó Turján: Channelling government securities redemption into VIBER and its effects on payment systems and its participants\*

*Starting from October 2009, redemption of government securities was transferred to the real-time gross settlement system (VIBER) developed for the settlement of time-critical transfers and operated by MNB. This step ensures that the settlement of redemption is performed in the clearing system where the financial performance related to the issue of government securities has been carried out for a long time. Channelling redemption to VIBER has achieved its goal, as it allowed the issuer (the Hungarian state) to use the funds stemming from the issue for the purposes of repayments and manage its liquidity in a simpler and more flexible way. In addition, this change has not caused a significant liquidity shortfall for participants in either of the two payment systems. This resulted in clearly less liquidity demand in the financial settlement processes related to the issue of government securities and redemption upon expiry. Not even a slight disruption was caused by changeover in the payment systems: thanks to proper preparatory work, all the affected system participants changed to the new liquidity procedure without any particular adjustment pressure.*

## PREVIOUS OPERATION OF AND PROBLEMS CAUSED BY THE FINANCIAL SETTLEMENT OF MATURING GOVERNMENT SECURITIES

In Hungary, HUF-denominated government securities are issued and redeemed by the Államadósság Kezelő Központ (Public Debt Management Centre, hereinafter 'ÁKK') with the participation of the Központi Elszámolóház és Értéktár Zrt. (Central Clearing House and Depository, hereinafter 'KELER') and the Magyar Államkincstár (Hungarian State Treasury, hereinafter 'Treasury', as the owner of the single treasury account, or 'KESZ'<sup>1</sup>). The financial settlement of

new government securities are usually performed on Wednesdays. Redemption is performed on the relevant maturity date, frequently also on Wednesdays.

For quite a long time, the Treasury received the amount of the newly issued government securities from its buyers (the so-called primary dealers, the custodians) in the real-time gross settlement system operated by the MNB for the settlement of large value, time-critical payments. Prior to October 2009, however, the Treasury performed its payment liabilities related to the redemption of government securities via the Interbank Clearing System (ICS), used for the transfer of retail payments in large numbers and run mainly at night.

### Box 1: Introduction to VIBER and ICS

VIBER is a real-time gross settlement system operated by the MNB, which is used primarily for the settlement of large value, time-critical economic transactions. If sufficient funds are available (gross principle), the transactions are settled in real time and consequently in central bank money – on bank accounts maintained at the MNB – with final and irrevocable effect. Settlement and clearing of transactions are not separated.

The amount of liquidity available in the system consists of the current account balances of the system participants and the intraday credit lines. From the members of VIBER only credit institutions are allowed to establish credit lines, i.e. the Treasury is excluded from doing so. The intraday credit line is available at the MNB free of charge if collateral provided in the form of blocked securities. The intraday credit line can be increased real-time during the day if the affected VIBER-member

\* 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.

<sup>1</sup> 'KESZ' is a HUF account opened by the Treasury at MNB for handling liquid funds and payment transactions of the general government. It is a bank account with an extremely high daily turnover that can amount to as much as several hundred billion HUF. Among others, economic participants pay their taxes to this account, and the Treasury pays pensions and numerous other public expenditures from this account. The government pays the amounts due on matured government securities ('redemption') to the owners of government securities, and receives the value incoming from the sale of newly issued government securities.

blocks securities approved by the central bank at KELER as the custodian with the MNB as beneficiary. (If the intraday credit remains in place at the end of the settlement day, the intraday credit becomes a secured overnight credit bearing interest at a rate equal to the ceiling of the central bank's interest rate corridor.)

However, the VIBER gross payment system is also capable of recognising situations called 'gridlock' when two or more members of VIBER would transfer cash to one another in a way that in the particular case the outgoing transfer would be covered by funds incoming from the other. In such cases VIBER is capable of settlement of the items at the very same moment of time in a way to take the incoming payment into consideration as liquidity for the outgoing payment, thus in practical terms the parties' payment transactions are technically netted towards each other. This procedure is called technical netting.

If gridlock is generated in connection with at least two VIBER accounts, VIBER launches gridlock resolution: on the accounts selected for gridlock resolution, the system only allows crediting from the accounts included in gridlock resolution, and then settles all debits in a way that the item with the highest priority is always in the first place in the queue, and in the case of identical priorities, the one that is received first. All the other accounts not included in gridlock resolution are credited and debited in the normal order.

Thus, priority has significance for payment settlements, as if there is insufficient liquidity, the item with the higher priority precedes the others. There are 99 priorities in VIBER. Ten of them are reserved for extremely urgent and urgent (time-critical) transfers, part of which are available for the exclusive use of the MNB, with the rest available not only for the MNB, but for KELER as well. The remaining 89 priorities are used for ordinary (time-critical) transfers which can be used by any VIBER member. In the case of identical priorities, the principle of FIFO is followed: the item submitted the earliest is settled the earliest. If a higher amount of uncovered item is at the head of the queue, this item blocks the settlement of lower amount items which are queued more in the background and might have been covered by the available liquidity.

As VIBER does not allow partial settlement, the optimum order of payment orders is essential.

During VIBER operation, the MNB exclusively uses VIBER's account management system for the performance of all account transactions for VIBER members. Outside VIBER operating time, accounts management is performed for this group of clients in the MNB's account management system called InFoRex.

ICS is a gross batch payment system operated by GIRO Zrt. for the settlement of domestic retail payments. Operation on a gross basis means that no credit risk is generated in the system as the transactions submitted by participants can only be settled up to the amount of liquidity. However, there is a netting effect in the system, which means that the amounts transferred to a participant by other participants can be used for financing the outgoing payments of the participant. As ICS performs the clearing of payment transactions, the MNB as the settlement bank is responsible for settlement. In ordinary business, settlements are made in the morning (at about 07:50) in MNB's account management system. During VIBER operating hours, the MNB's account management system is identical with the VIBER account management system in respect of VIBER members, and thus in the case of queuing due to a lack of sufficient funds, or late payment orders sent by the participants, settlement is finished in an extraordinary settlement phase (sometime between 09:30 and 12:00) within VIBER.

For the purposes of settlement in ICS, participants set up a so-called LIMIT with the MNB; this denotes their liquidity available for settlements. This consists of two parts: the balances of their current accounts maintained at the MNB and the overnight credit line against collateral posted in favour of the MNB. The overnight credit line may be modified up to 18:00 hours every business day, and subsequently the available LIMIT remains unchanged. With a view to the fact that – from the aspect of settlement – VIBER's operating hours precede those of ICS, VIBER's closing balance is fully accounted in the LIMIT, and when VIBER opens, the ICS clearing results are promptly booked; for this reason the system takes the received funds into consideration in the VIBER balance.

Due to this procedural order and the time shift between the two systems (from the aspect of this given payment order the ICS's operation precedes VIBER's operation), within the settlement day the Treasury had to transfer the amount for the redemption of the maturing government securities earlier than it could have access to the funds collected from newly issued securities which were meant to finance – partly or wholly – the maturity. This meant that the Treasury had to keep the total gross amount of the maturity on KESZ prior to maturities, despite the fact that the majority of funds stemming from the sale of newly issued government securities was meant to finance redemption of the maturing government securities. This situation resulted in the fact

that due to the intraday liquidity requirement, on these days the Treasury was required to keep a higher balance in KESZ than otherwise required.

## MOTIVATION FOR IMPROVEMENT IN EFFICIENCY

At the MNB's initiative, the institutions involved (ÁKK, the Treasury, KELER and MNB) agreed that in order to improve efficiency, the above situation had to be changed. The objective they kept in view was to reduce the issuer's intraday liquidity as well as its administrative burden. They endeavoured to actually finance redemption of the maturing

government securities within a particular settlement day from the funds stemming from the issue of government securities. In the early phase of preparatory work, still in December 2008 and January 2009, ÁKK conducted preliminary consultation with the custodians on the opportunity to introduce an early submission deadline during the day, and in effect they did not object. This opportunity proved feasible and was integrated into the solution alternatives.

At the end of 2008 and in early 2009, the experts of ÁKK, the Treasury, KELER and the MNB analysed three alternatives for the settlement of flow of funds. The common features of the possible solutions included the requirement that redemption of the government securities should be channelled from ICS to VIBER and the fact that each of them was based on netting by KELER's participation. The fundamental difference was that netting was performed in narrower<sup>2</sup> or wider ranges. Due to its simpler and more robust nature, from among the three possible solutions, the institutions involved selected the one that was based on the widest netting and utilisation of VIBER's technical netting capacity.

The Appendix provides a report on a similar international initiative by the US Fed, when they terminated free intraday credit for government-sponsored enterprises and gave them two years for adjustment to the changes.

## TECHNICAL NETTING SETTLEMENT IN VIBER

This type of settlement facilitates netting both in the case of custodians and the issuer by submitting payment orders via VIBER almost simultaneously, and it continues to be based on the DvP (*delivery versus payment*) procedure. The latter means that cash settlement of a transaction – in the payment and securities settlement systems (by applying the conditionally connected settlement method) – takes place parallel with the settlement on the securities side. (In practical terms, the way this is implemented in Hungary is that KELER checks whether or not the securities are available on the seller's account and if they are, it 'seizes' them. Then KELER initiates the cash transaction via VIBER and once the cash transaction is fulfilled in VIBER, the securities side booking also becomes final.)

KELER is involved in the settlement of government securities issuance and repayment as a paying agent. Payment is related to two phases. One of the phases is the financial settlement of newly issued government securities, when the

cash accounts of custodians – registered in the so-called auction list – are debited and the issuer's cash account is credited. (The auction list contains whose bids and the terms and conditions ÁKK accepted on the basis of auctions for government securities trading, announced for primary dealers for making public bids.) The other phase is the settlement of matured government securities: the issuer's cash account is debited and the custodians' – according to the so-called payment disposition – cash accounts are credited. (The payment disposition reveals to whom ÁKK must make the payment on maturity and of what amount.) Both in case of maturity and new issues, cash settlement takes place in VIBER.

The essence of the change is that based on the payment disposition relevant to matured government securities, on the maturity date KELER initiates the settlement of cash transactions arising from maturing items in a manner that debiting the issuer's account and crediting the credit institutional custodians' account is executed on their account kept in VIBER. The financial settlement of primary deals related to the issue of new government securities, is also implemented in VIBER on the same day. Thus, it is sufficient if the issuer provides a volume of funds on its account for the purpose of repayment, by which his repayment obligation exceeds the liquidity gained from issuance. Otherwise, if the repayment obligation is less than the liquidity gained from issuance, the issuer does not need any additional funds, moreover, a liquidity surplus may be generated during the day or by the end of the day, the latest, which the issuer can use for any other purpose.

Taking into account that KELER initiates the settlement of payments for both new and matured securities at the beginning of the relevant settlement day by the latest in VIBER at the time it opens, and high priority – which precedes all other payment orders, with the exception of central bank items – is separately assigned to these payment transactions (related to the government securities), therefore it can be taken as almost certain that all payment items are executed on the intended settlement day.

Payment orders that have sufficient cover in VIBER at the given point of time, will be settled immediately and irrevocably in VIBER, while the rest of the items are queued (the above mentioned high-priority government security items that are perhaps queued, come right after the central bank items, before all other items). Any queued item will be processed when the VIBER member's liquidity increases (receives a credit item from another VIBER member or his or her credit line is increased) or

<sup>2</sup>The narrower solutions, which were later rejected, were directed either at netting on the Treasury's side or at bilateral netting with each affected custodian.

the gridlock resolution algorithm functions well in the case of so-called gridlock. In practical terms, this means that if a high-priority item related to the purchase of new securities is first in the queue, practically no other debit can be made to the custodian's account (in other words, the transaction of payment for government securities precedes all its other payment items, and so until the former is settled, the given custodian's outgoing payment transactions are halted). Thus (if required) it will be motivated to provide liquidity as soon as possible: to increase either its current account balance or the same-day credit line.

Gridlock resolution is implemented by including all the accounts that are affected by gridlock, thus if gridlock applies to more than two VIBER accounts, then logically it is implemented multilaterally. This fact in general facilitates the settlement of payment transactions, and moreover the

high priority of the affected government security deals further reinforces this effect.

VIBER members can be notified (via SWIFT messages) about settlement, queuing and the size of queuing as well, whereas information on which member owes them is not visible to the other members. Thus, during the day both the issuer and the custodian can see how and when their incoming and outgoing items are settled and on the basis of the queued item(s) each participant can make arrangements to provide the funds necessary for gridlock resolution in the event that the gridlock resolution algorithm fails due to a general liquidity shortage. Any item still queued at the end of the day will be cancelled, thus the issuer needs to accumulate other resources for financing the missing funds concerning repayment.

The model is demonstrated – based on a specific example selected for illustration purposes – in Box 2.

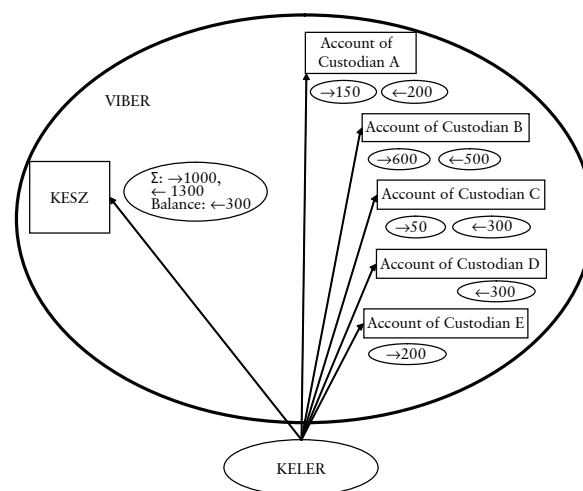
**Box 2: Illustration of the selected solution**

We demonstrate the selected solution by way of an example, when KELER initiates a debit transaction of altogether 1,000 units at the issuer: to credit 150 units to A custodian, 600 units to B custodian, 50 units to C custodian and 200 units to E custodian, while it initiates a transaction to debit 200 units to A custodian, 500 units to B custodian and 300 units each to C and D custodians, thus it initiated a payment order of altogether 1,300 units by crediting the issuer's account.

In this example, the issuer's need for cover is 0, given that the incoming items guarantee that the outgoing items are settled through gridlock resolution based on VIBER technical netting. This is contrasted with the solution deployed in the previous system, when in KESZ – regardless of the incoming funds – the full redemption amount was required because the redemption was made at an earlier time in another clearing system (ICS). Thus according to the specific example, in the past 1,000 units had to be kept in KESZ in the evening before the settlement day, while within the new system there is no need for a balance of such an extent, because incoming funds are more than enough to cover payments.

Thus, if by the end of the day in addition to A and B custodians at least C or D custodian duly buys government securities held for them, a 1,000-unit fund is received by the issuer therefore the issuer does not need to provide additional funds to fulfil the repayment. Should custodians fail to have sufficient funds by the end of the day, they do not get the government securities held for them at the auction and the issuer would need to make further arrangements to provide the missing

**Chart 1**  
**Payment flow t in case of technical netting settlement in VIBER**



amount (for 300 units). It is important to emphasise that this situation would mean that the given custodian is completely insolvent, given that the issuer's claim is queued with the greatest non-MNB priority in VIBER, thus it precedes all other items in the given custodian's queue. If the custodian failed to eliminate queuing even for this item by the end of the day, this means it was unable to perform payment to anyone, and it is insolvent<sup>3</sup>.

<sup>3</sup> As already indicated above, in such a situation an issuer may assume liquidity risks due to his or her partner's insolvency, but not credit risks (due to the DvP principle). This type of liquidity risk cannot be handled by any clearing mechanism because what happens here is that someone had contracted at an auction to buy government securities but later, on the day of settlement it does not pay for them. This risk can be managed (e.g. by introducing more stringent requirements for the members, carefully selecting the primary dealers or establishing a liquidity buffer, etc.), but not within the framework of a clearing solution.

The technical netting implemented in VIBER did and does facilitate that items initiated to debit KESZ are not financed by the KESZ balance (made available on the previous day), but by the funds stemming from the sale of new government securities. In order to provide the ability that this takes place in a timely manner in every case, it was necessary to ensure that KELER initiates the payment order at the beginning of the day with a very high priority. Namely, this results in Treasury-ÁKK receiving the purchase price by all means at the beginning of the day, on the condition that the respective custodians are solvent. The high priority assigned to government securities guarantee that the system properly works because it forces the custodians to provide the liquidity for the purchase of government securities, otherwise their payment transactions would practically stop – with the exception of MNB items – and no single debit item could be posted on their current account, as long as they do not pay for the government securities.

What facilitated to assign a high priority to government securities was that the MNB gave such a high priority (priority ‘six’) to KELER, starting from October, 2009, which it formerly reserved exclusively for itself for the central bank related payment orders, but it essentially did not use this priority. Assigning priority six did not represent any threat from the MNB’s perspective, given that the MNB continues to have the exclusive right to apply priorities ranging from zero to five. The gridlock resolution algorithm was triggered automatically every 30 minutes before the new system was launched, however, the option was already available as the MNB’s responsible person manually activated it even at the request of any VIBER member. At the time the proposal was elaborated, we also presumed that the timely settlement of government securities will be possible to guarantee in most cases – as a joint impact of its high priority and submitting it at the start of the day – even without deploying the gridlock resolution algorithm. In order to further enhance the efficiency of the solution, the MNB also introduced the practice to launch the gridlock resolution algorithm more frequently, at intervals of every 10 minutes, instead of the earlier 30-minute intervals.

For the implementation of the solution, some minor development was necessary only at KELER, which was carried out by September, 2009. In addition to the development, testing was also carried out. On the basis of the test results, the MNB concluded that no threat is represented by the increased use frequency of the automated gridlock resolution algorithm for VIBER’s operational stability, and on the other hand ÁKK,

KELER and the MNB unanimously agreed that the new system of repayments can be launched. ÁKK and the MNB equally called the custodians’ attention to the changes in the settlement system of government securities, with the MNB particularly emphasising that due to these changes, the liquidity arising from government securities maturity will not be provided to them in ICS. Thus, during the overnight ICS settlement the liquidity cannot be taken into account as cover for their outgoing ICS items. (Naturally, in order to ensure application of the new settlement system, the contractual conditions had to be modified<sup>4</sup>/established<sup>5</sup> as well.)

## ANALYSING THE IMPACTS OF CHANGEOVER ON THE CLEARING SYSTEM PARTICIPANTS

Oversight of the payment, securities settlement and clearing systems is the central bank’s basic responsibility according to Section 4 (5) of the Act on the MNB. The explanation in the Act defines oversight activity as a *systemic risk-oriented supervision* of the operation of clearing systems, *participating institutions*, infrastructures connecting these systems and the processes applied in payments and the payment methods. Accordingly, the MNB reviewed the impact of the decision on channelling government securities maturities from ICS to VIBER in its capacity as overseer.

Under the old regime, each credit institution provided KELER with the account number to which they requested the redemption of government securities at maturity. If the account was the credit institution’s current account,<sup>6</sup> kept at the MNB, then during the overnight settlement in ICS, the amount of repayment was received by MNB, which was then credited to the respective credit institution by MNB within its proprietary account keeping system. Thus channelling government securities to VIBER did not represent any change for these partners (roughly 30 credit institutions) given that they did not use the government securities maturities as coverage for the overnight processing under the previous regime either.

There were, however, 12 credit institutions which requested the government securities maturity to their technical account managed under their own bank code, rather than their current account held at the MNB. This meant that they could use the funds received during the ICS overnight settlement to cover their outgoing items. Among these 12 credit institutions, there were some significant ones: retail and investment banks as well as several players of the custodian market.

<sup>4</sup> The framework agreement between ÁKK and the custodians (by prescribing the deadline for same-day submission), as well as the business terms and conditions applicable to MNB account keeping (by assigning priority six).

<sup>5</sup> The payment agency contract between ÁKK and KELER and also specifying the fee payable.

<sup>6</sup> In other words, account numbers beginning with 190 (190 is the MNB’s bank code).

**Box 3: Methodology of the prior and posterior impact analysis**

**The notion of available liquidity remaining after clearing**

During the prior impact analysis, in order to assess the impact on liquidity, we considered the available liquidity remaining after clearing (this is 100% in the charts) as the amount of the given credit institutions' LIMIT generated for the overnight clearing plus the net balance of the clearing (credit items minus debit items), from which we deducted the amount of government securities due on the given day. Then we compared the resulting 'modified liquidity remaining after clearing' with the 100%. In assessing the impact globally for the system, we generated a ratio for the cumulated LIMIT of all ICS participants. Of the 12 affected credit institutions, some were less and some were more impacted, thus it seemed to be practical to observe the impact on the two categories separately.

**Net financing need**

The net financing need is computed by comparing the cumulated net debit balance of those system members, that are in a net debit position – those that send an amount larger than what they receive – to the entire given day's turnover in ICS.

**The reviewed period**

We performed a prior impact analysis of the periods of July to September 2008 and March to May 2009, regarding the realignment of the liquidity situation in the affected systems. 26 government security maturity days were included in these periods. The basic reason for selecting two periods that are not connected was that the global crisis reached the Hungarian financial system in October 2008 and in the analysis we were curious to find out to what extent the impact of channelling the government securities maturities into VIBER would have been different for ICS participants before and after the crisis. For the purposes of this article, we calculated using an average of the two periods.

We performed our posterior analysis for the period of October 7, 2009 to January 27, 2010, which included 18 government security maturity days. The method applied for estimating the actual liquidity impact was the reverse of the method described for liquidity remaining after clearing: we increased the affected ICS members' liquidity remaining after clearing with the amount of government securities maturing on the same value date – now settled in VIBER – and thus we received the hypothetically available liquidity that does not reflect the impact of the change. We considered this to be 100% when formulating the ratio numbers and defined the change in the liquidity position for the same, earlier identified, less sensitive and more sensitive participants.

Liquidity falling out from ICS had an impact on 12 credit institutions, but unequally. Out of the twelve, the new arrangement had the most adverse impact on the participants of the safe custody market since in addition to the securities in their ownership they also used the amount of their customers' securities during the night settlement. In the case of the hardest hit group, our analysis suggested altogether 11% less liquidity on average (see Chart 2) in the liquidity available in ICS after clearing. A decrease in liquidity of this extent cannot be considered dangerous because these participants had already increased their credit line – which represents a major part of their LIMIT generated for the purposes of the ICS settlement – to its multiple since October 2008<sup>7</sup>, in order to offset the effects of the crisis. Our model based on past figures could only detect a case in which the participants' credit line was insufficient for financing outgoing payments when the maturity of government securities coincided with a deadline

for the payment of some kind of public duties (taxes). Funding would not be insufficient even in such cases as due to the mandatory reserve requirement large credit institutions keep substantial current account balance at the MNB, as compared to their ICS turnover. For this reason these credit institutions could easily replace the liquidity falling out from ICS through the usual funding methods.

Our posterior analysis revealed more favourable findings than what was expected about the liquidity remaining after clearing both in case of the more and the less affected system members. This is explained by the fact that ICS participants had increased their credit lines by 36% between the compared two periods of time, which offset the effects of the minimum reserve ratio's decrease<sup>8</sup> and increased the LIMIT available for clearing. Usage of credit lines indicated that the credit line increase was performed for more preventive reasons rather than to meet actual financing requirements.

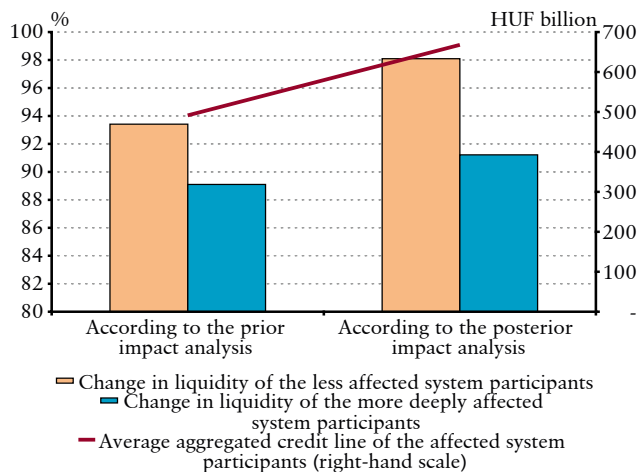
<sup>7</sup> See MNB: *Report on financial stability*, April 2009, Chapter 2.3.1; and MNB: *Report on financial stability*, April 2010, Chapter 2.8.

<sup>8</sup> The MNB decreased the reserve ratio from 5% to 2% effective from 1 December 2008.

Chart 2

### Effects of the decision on channelling government securities to VIBER according to pre- and posterior impact analyses of the affected participants

(as percentage of the amount actually available for clearing, see Box 3)



As a result of the preliminary impact analysis we pointed out that credit institutions with extensive corporate clientele need to calculate their liquidity in ICS with increased prudence in order to avoid queuing when tax payment deadlines coincide with the maturity date of government securities, since on these days their outgoing payment turnover is already several times higher and the financing effect of government securities no longer offsets this volume in ICS.

## CHANGE IN THE LIQUIDITY POSITION OF THE SYSTEMS

### ICS

As mentioned in Box 1 above, part of the netting effect was lost with channelling into VIBER, as government security maturities – generally of large amount – are now excluded from the incoming items. For the 12 affected participants, migration to VIBER of their credits stemming from maturing government securities, previously available for clearing, reduced the potential netting effect by 23% altogether, in the period chosen for posterior analysis, in comparison to their aggregate remaining liquidity available after clearing. Accordingly, the net financing requirement of the clearing has increased. If, hypothetically, the liquidity generated from government security maturities was returned to ICS, the net liquidity requirement calculated for the most significant participants on the maturity days of government securities would fall from 10.8% to 6.4% on average according to the data observed after 7 October 2009.

Nevertheless, pressure on raising additional funds was insignificant, given that the current average 10.8% net liquidity requirement still indicates very ample liquidity availability.

Total ICS debit turnover has decreased overall. Regarding the 44 government security maturity days selected for the prior and posterior analysis, the average of total daily debits in ICS decreased by 21.1% between the periods preceding and following the 7 October 2009 change. 17.6 percentage points of this was due to channelling government security maturities into VIBER, and further 3.5% to other factors, mainly such as the decrease in the average item volume, in parallel with the decrease seen in the real economy, i.e. GDP decline, and the stagnation of turnover in terms of number as well as value of payments.

However, liquidity in the ICS system as a whole was only slightly affected by the change in the channel of government securities clearing. At the system level, the actual loss of liquidity was merely 2.6% in average of the government security maturity days falling within the analysed period, for all participants of the system. This underpins our preliminary estimate, as we calculated a 3% potential liquidity loss for the entire system and 5-7% for the individual clearing members (see Chart 2).

### VIBER

In VIBER liquidity practically remained unchanged after the channelling of government securities. The reason for this is that previously, the incoming funds from government security maturities had also been credited to VIBER from the participants' current accounts held at the MNB at the opening of VIBER,<sup>9</sup> as the liquidity received in ICS was the first item added to VIBER's liquidity on any particular day through the posting of the interbank position matrix. Thus from VIBER's perspective, the only change caused by the channelling of government securities was the submission time schedule of payment orders by participants.

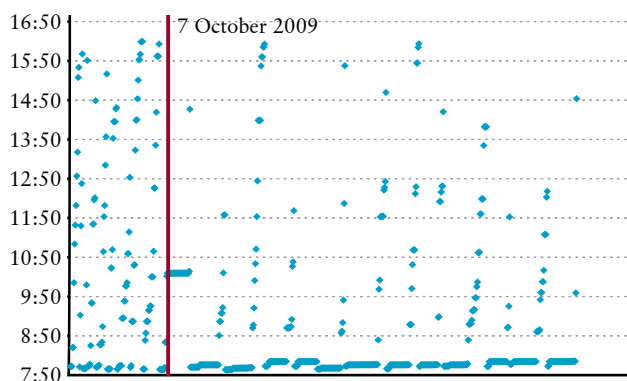
The change in timing is best observed in the Treasury's case. Owing to the new procedure, the ratio of cleared securities transactions has perceptibly increased in the first hour of VIBER's operation up to 09:00 hours. Prior to the change, the Treasury's total outgoing securities-related VIBER turnover, cleared before 09:00 hours, accounted for 30% in both number and value of payments, as a percentage of the intraday DvP orders. Following changeover this ratio rose above 75%. Chart 3 clearly illustrates that due to the adopted procedure, the timing of Treasury items on the

<sup>9</sup> See Box 1 above.

**Chart 3**

**The Treasury’s time schedule pattern in VIBER on the maturity days of government securities**

(maturity days are shown on the horizontal, and intraday clearing time on the vertical axis)



maturity and issue dates of government securities now follows a definite pattern, where clearing of the redemptions in the beginning of the day around VIBER opening time prevails.

As for system members, it could be observed that while there is an increase in the number of securities-related transfers to the Treasury during the morning hours, their value has decreased, and this decrease has shifted to the period between 09:00 to 12:00 hours. In practice, this means that VIBER members slightly delay the execution of their high-value securities-related transfers in order to make use of the financing effect of payments received from the Treasury up to 09:00, eventually for fear of queuing in the morning because of the execution of a major value transfer.

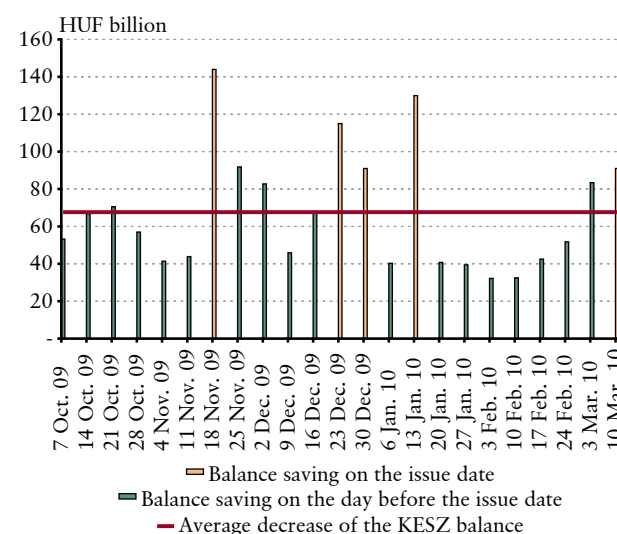
In order to prevent similar concerns, simultaneously with channelling security maturities to VIBER, the MNB reduced the intervals at which automatic gridlock resolution is launched. This step was applied with a view to allaying such fears. Its practical use would be manifest if the redemptions of and subscriptions to government securities were queuing among the same system participants vis-à-vis one another because of funds shortage. Obviously, gridlock resolution could be efficient in a situation where turnover is higher or liquidity is tighter than currently (similarly to the period around October 2008). However, in the period observed after 7 October 2009 not a single item was executed by gridlock resolution – it always used to be infrequent – which means that no such situation occurred. The reason for this lies primarily in the fact that the VIBER participants can use their credit lines, increased to its multiple as a result of the crisis. All of this supports VIBER’s ample liquidity supply.

**PRIOR AND POSTERIOR ANALYSIS OF DEVELOPMENTS IN KESZ BALANCES**

One of the arguments justifying change in the settlement of securities transactions was to achieve potential reduction in the KESZ balance.

**Chart 4**

**Decrease in the KESZ balance achievable by the Treasury in the period since the change (7 October 2009)**



Our posterior analysis covered 23 government securities maturity days falling in the period between 7 October 2009 and 10 March 2010, each also being an issue date. In this period, HUF 67 billion could be saved on average on the KESZ balance. On each analysed day, both issues and redemptions were due. On five days redemptions exceeded the value of issued government securities. On these days savings in the KESZ balance was considered equal to the amount collected from issues, as this is the amount by which the KESZ balance did not have to be increased to fulfil redemptions. In those more frequent cases when issue exceeded the value of redemptions, the saving on the KESZ balance materialises in that there is no need to pre-fund the redemptions one day before the value date, as it could fully be financed from the inflow collected from the issue.

**CONCLUSIONS**

In October 2009, the arrangement for financial execution of the redemption of maturing government securities to the primary dealers (custodians) changed. Since then, KELER as paying agent acting on behalf of ÁKK, initiates redemption



in VIBER in the morning on the due date. Thus, execution of the redemption has been relocated to the payment system (VIBER) which has been accommodating the execution of the issue of new government securities for a long time.

In addition to custodians, changeover now allows the issuer (the Hungarian State) to use the funds received from the other party (parties) as funding for the outgoing settlements. As a result, liquidity management has become simpler and more flexible for the issuer and ÁKK, and the redemption of maturing government security (all other conditions remaining unchanged) can be transacted with far lower current account balances, and thus liquidity savings are realised. The change in the clearing channel also created identical conditions for all parties involved, as ÁKK and the custodians execute their outgoing payments simultaneously with the help of technical netting available in VIBER.

Changeover was performed smoothly both in VIBER and in ICS, the system previously used for the redemption of maturing government securities. Prior to the change, the MNB did not forecast significant changes in the level of liquidity risk involved in the systems. Thorough preparation of the affected parties and the preventive measures taken (re-shaping the priority scale, introduction of more frequent gridlock resolution, attention drawn to the possible impacts on liquidity of the change of regime), meant that liquidity risks have not materialised in any of the payment systems; the Treasury, however, could theoretically execute government security redemption with lower liquidity than prior to the change, while the other participants' liquidity remained approximately at the same level.

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## ANNEX: A SIMILAR INTERNATIONAL INITIATIVE

Although for different motives, similar initiatives can be seen in the international practice (McAndrews, 2006). Pursuant to its 2004 decision, the Fed terminated free intraday lending for government-sponsored enterprises (e.g. Fannie Mae, Freddie Mac, hereinafter 'GSE') and provided them two years for adjustment to the change. According to a preliminary impact analysis undertaken by the Fed, the measure led to delays in the performance of payments started by GSEs, but sufficient time was allowed for the proactive mitigation and elimination of this effect. The basic situation was similar to the one found in Hungary: settlement related to government securities as performed in two systems, as incoming and outgoing payments were not aligned in the case of GSEs on financing terms (despite the fact that they were actually transacted in the same system), while prior to 2004 this was solved by intraday credit granted by the Fed.

The article referenced here lists several options for offsetting the effects of intraday credit termination, one of them being pre-funding, which practically corresponds to the initial state of affairs in Hungary, as it requires additional accumulation of funds and bearing all of its costs (GSEs have non-interest bearing accounts kept at the Fed). A far more efficient solution is offered in the modification of market conventions related to payment timing. In the USA, this requires primarily the match the inflow and outflow of GSEs' payments between days and within one day. Effects on the participants affected by payments may be mitigated if pursuant to multilateral agreements GSE's measures are supported by advanced queuing and liquidity-savings procedures in the payment systems performing clearing and settlement. In Hungary, this direction was followed under the control of ÁKK, the Treasury, KELER and the MNB.

In the USA, partly due to the central bank's intraday lending policy features, in the case of GSE's the issue of accommodating the intraday funding needs from alternative sources also arose (outside the central bank – using correspondent banking, bilateral funding arrangement relying on lines of credit, implicit or explicit intraday market for funds), while in Hungary the solution described in this paper was considered more efficient and faster than the above US methods.