Lóránt Varga: Introducing optional reserve ratios in Hungary*

As of the reserve maintenance period commencing in November 2010, Hungarian credit institutions will be free to decide whether to apply the previously valid 2% reserve ratio, or to apply a higher mandatory reserve ratio. Credit institutions required to hold reserves may select from reserve ratios of 2, 3, 4 and 5%, and may change their decision on a semi-annual basis.

In line with the international best practice, the purpose of the MNB's reserve requirement system is to support credit institutions' liquidity management by the monthly averaging mechanism and to thereby contribute to narrowing the gap between short-term interbank rates and the central bank base rate. Indeed, with the intra-day and inter-day fluctuation of amounts held on their accounts with MNB as required reserves, credit institutions are able to manage, to a certain degree, unexpected short-term liquidity impacts they may be exposed to. Thus, banks are less dependent on overnight central bank deposits and loans, which, however suitable for managing unexpected liquidity impacts, are known to divert interbank rates from the central bank base rate.

It should be emphasised that in modern central banking practice – when the economy is influenced through determining the central bank base rate rather than money supply – changing the reserve ratio does not impact the direction of monetary policy. That is, the raising or lowering of the reserve ratio does not generate any monetary tightening or easing within the operating frameworks of most of today's central banks. Accordingly, the sole purpose of the MNB's latest measure is to facilitate liquidity management for the banking system, and it is not intended to influence aggregate demand and inflation via credit supply.

Based on recent experience, credit institutions differ significantly from one another regarding the reserve ratio which is optimal for managing their own liquidity. While the 5% reserve ratio which was in effect until November 2008 was too high for some credit institutions, the current 2% ratio is too low for banks with relatively high payment turnover. Therefore, by introducing optional higher reserve ratios, the MNB seeks to ensure that in the future the reserve requirement system will support the liquidity management of all domestic credit institutions with appropriate efficiency, while also contributing, to the largest possible extent, to the narrowing of the gap between interbank rates and the central bank base rate.

THE PURPOSE OF THE MNB'S RESERVE REQUIREMENT SYSTEM IS TO SUPPORT THE LIQUIDITY MANAGEMENT OF CREDIT INSTITUTIONS AND NARROW THE GAP BETWEEN INTERBANK RATES AND THE CENTRAL BANK BASE RATE

Due to their considerable differences, reserve requirement systems should always be assessed individually, taking into consideration their most important parameters and the role of the reserve requirement in the given central bank's monetary policy instruments. At present, the reserve requirement is one of the most misinterpreted instruments of a central bank, and one frequently encounters misunderstandings about its role. This is true notwithstanding that in the modern practice of international central banks – regardless of how diverse the parameters of the reserve system may be – there has been a certain consensus for quite some time regarding the potential roles which reserve requirements can play in today's monetary policy schemes.

In Hungary, all credit institutions and branches of foreign credit institutions are subject to reserve requirements. This means that each credit institution is required to deposit a certain forint amount on its account held with Magyar Nemzeti Bank (MNB). This amount is referred to as the reserve requirement; its volume is the product of the reserve ratio and the reserve base of the credit institution concerned. The reserve base is defined as the total of certain liability categories (typically liabilities with maturities less than 2 years) in the credit institutions' end-of-month balance sheet, while the reserve ratio stipulates the percentage of this

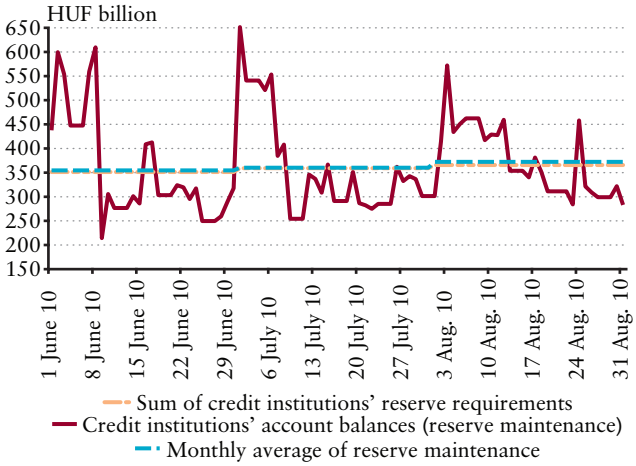
* The views expressed in this article are those of the author(s) and do not necessarily reflect the offical view ot the Magyar Nemzeti Bank.

amount to be deposited with MNB as reserves. A new reserve requirement is calculated for all credit institutions in each month. As the calculated amount must be maintained for the entire calendar month, calendar months are also known as 'reserve maintenance periods' for the purposes of reserve requirements.

The averaging mechanism is the most important feature of the MNB's reserve requirement system. This means that credit institutions are not required to deposit their total reserve amount on their MNB account every day. Instead, they must manage their funds held with the MNB so that the average of end-of-day balances for every calendar month fulfils their reserve requirement prescribed for the specific month. The way averaging works in practice – based on the June, July and August 2010 reserve maintenance periods – is illustrated by Chart 1.

Chart 1

The reserve requirement system's monthly averaging mechanism at work



Source: MNB.

After the end of each month, the MNB verifies whether a credit institution's average closing account balances for the month concerned met the respective reserve requirement, and pays market interest on the deposited reserves. Thus, if a credit institution's average account balance for a certain month fulfils the reserve requirement prescribed for the credit institution, the MNB pays the central bank base rate on the required reserve amount. It should be noted though that additional account balances – i.e. excess reserves – do not earn any interest.

On the other hand, if the credit institution's average account balance for the month concerned falls short of the required reserve amount, the MNB pays the central bank base rate only for that lower amount – i.e. the part of the reserve requirement that was met – while also charging the credit institution a penalty, the amount of which is calculated as the product of the penalty interest, which corresponds to the central bank base rate, and the shortfall amount. Thus, the MNB sanctions both under- and over-reserving to the same extent: in the case of over-reserving by interest withheld, and in the case of under-reserving by penalty interest, both equalling the central bank base rate.

In summary, based on its main features, the MNB's reserve requirement system uses an averaging mechanism, pays market interest and equally sanctions both under- and over-reserving. Rather than having developed by coincidence, these features are closely connected to the objective the MNB seeks to achieve through the operation of the reserve requirement system.

The sole purpose of the MNB's reserve requirement regulation is to support credit institutions in managing liquidity by the monthly averaging mechanism and to help mitigate the fluctuation of interbank rates and their permanent deviation from the central bank base rate. With the MNB paying central bank base rate on required reserves but nothing on additional funds, banks generally maintain exactly the same average monthly balance as their specified reserve requirement, as seen on Chart 1.

If, on a given day, a credit institution faces an unexpected demand for liquidity because, for example, one of its major clients submits a payment order for a significant amount, it has several options for managing the situation. It may raise the required funds from the interbank market, i.e. by taking a short-term loan from another bank. It may also take a central bank overnight loan, but this is expensive: the MNB's overnight credit instrument bears an interest rate that is 1 percentage point higher than the central bank base rate. Finally – thanks to reserve requirement averaging – it may also opt to reduce its account balance below the reserve requirement, to be offset by maintaining a higher balance throughout the remaining part of the reserve period.

Accordingly, the averaging mechanism functions as an additional tool for banks to manage liquidity shocks they may face. If there were no averaging mechanism, the account balance of the banks would have to meet the reserve requirement at the end of each day, while an overly tight scope of action for averaging the reserve account would only be suitable for tackling smaller liquidity shocks.

In the case of large-scale shocks impacting the entire banking system, there would be a considerable excess demand or oversupply in the interbank market, and credit institutions would be forced to resort to overnight central

bank loans or deposits much more often.[1] This would temporarily divert interbank interest rates from the central bank rate to a considerable extent, as the interbank price of liquidity would then be determined by the actual interest rate on the overnight central bank instrument taken, and the interest of the overnight deposit and overnight loan is 1 percentage point lower and higher, respectively, than the central bank base rate.

Moreover, to ensure their liquidity management, over the long run banks would likely adjust to the absence of averaging or a tight scope of action by creating a permanent overnight central bank deposit portfolio. This is because the liquidity of the overnight central bank deposit is extremely high, as it expires every day, and thus it is suitable for managing banks' unexpected liquidity demands. As a result of this the interbank interest rate could be permanently and considerably, by up to 1 percentage point, lower than the central bank base rate, which may reduce the efficiency of the monetary transmission.

Thus, the reserve requirement system, with an appropriate averaging mechanism, is one of the most important tools for smoothing interbank rates and mitigating their deviation from the central bank base rate. As described later, the optional higher reserve ratios have been introduced precisely because the prevailing 2% ratio was no longer sufficient to provide some Hungarian banks with a broad enough scope for averaging.

THE SIZE OF RESERVE REQUIREMENTS IMPACTS NEITHER THE MONETARY POLICY STANCE, NOR THE LENDING CAPACITY OF BANKS

Many readers might find it odd that the purpose of reserve requirements is to support the liquidity management of credit institutions and narrow the gap between the interbank rates and the central bank base rate. This is because in textbooks and articles on monetary policy the reserve ratio and reserve requirements are often described as tools to influence the credit supply of commercial banks, which – through the money multiplier – is also suitable for controlling the broader money supplies in the economy.

These interpretations state that higher reserve ratios reduce the potential credit supply of banks, which results in a decrease in the money supply in the economy, i.e. a stricter monetary policy. On the other hand, a lower reserve ratio represents a looser monetary policy as it increases the lending capacity of banks, thereby swelling the money supply in the economy. However, these correlations are no longer valid in the majority of today's monetary policy systems.

Box 1: How does the reserve ratio work as a monetary policy instrument in the money multiplier model of textbooks?

Simply put, the classic money multiplier model states that a commercial bank can make available only a certain part of its deposits as loans, as it has to deposit the rest with the central bank as required reserves. If, for example, a commercial bank originally has 1,000 units of money on its account held with the central bank and the reserve ratio is 10%, then of the 1,000 units it can lend out a maximum of 900 units as loans, while it keeps 100 units (the product of the 1,000 units of funds and the 10% reserve ratio) as required reserves on its central bank account. Assuming that the 900 units lent out as loans ends up with another commercial bank as a deposit, then of these 900 units the second bank can only lend out 810 units as loans, while keeping 90 units on its central bank account as required reserve, and so on (Chart 2).

If this deposit placement and lending process expands, then the loans granted by the commercial banks, i.e. total amount of commercial bank money will be

$$1000 \times [(1-r) + (1-r)^2 + (1-r)^3 + (1-r)^4 + \ldots] = 1000 \times (1/r)$$

in the economy, which translates, using the 10% reserve ratio of our example, into 1,000×(1/0.1) = 10,000 units.[2] The above formula illustrates the reason why the reserve requirement plays a key role in this model. If the reserve ratio, i.e. r in the formula increases, commercial banks can lend less, thus they can create less commercial bank money. On the other hand, decreasing the reserve ratio will increase the banks' lending capacity and the volume of commercial bank money in the economy.

[1] Liquidity shocks impacting the entire banking system are events generating such unexpected liquidity demand or liquidity surplus in central bank funds, which result in the change of the entire banking system's liquidity, rather than the mere reallocation of funds between banks' accounts. These are usually connected to payments between the banking system and the government, or the banking system and central bank. Typical liquidity shocks impacting the entire banking system include the difficult–to-forecast tax payments of corporate customers (e.g. VAT payments) or unexpected, large payments from the treasury account of the government held with MNB.

[2] As it has no impact on our conclusions, we refrained from providing the full details of the model, thus – amongst others – we do not touch upon the fact that the economic agents may also keep cash. The money multiplier-based model of money supply is described in detail by, for example, Mankiw (1997), McCallum (1989).

Chart 2

The money multiplier in principle

Central bank money supply = 1000
Reserve ratio (r) = 10%

Bank No.1		Bank No.2		Bank No.3	
100 reserves at central bank	1000 depostis	90 reserves at central bank	900 depostis	81 reserves at central bank	810 depostis
900 loans		810 loans		729 loans	
Lending potential: 1000×(1-r)		**Lending potential:** [1000*(1-r)]×(1-r) = 1000×(1-r)		**Lending potential:** [1000*(1-r)^2]×(1-r) = 1000×(1-r)^3	

It is important to see that the money multiplier is built on the basic assumption that the volume of central bank money available at any time for the banking system is a fixed amount determined by the central bank in advance – in our example 1,000 units – that is multiplied through the commercial banks' lending activity into a larger volume of commercial bank money defined by the reserve ratio, in our example into 10,000 units. This assumption is not valid in the case of today's monetary policy systems and instruments, thus the money multiplier model presented above cannot work in the described form either.

Even in theory, the textbook model of the money multiplier could work in a banking system where only a predetermined volume of central bank money is available for commercial banks (Box 1). The assumption of money supply controlled by the central bank instead of determined on the basis of the commercial banks' demand for central bank liquidity was mostly satisfied by monetary policy systems that targeted monetary aggregates, followed by the central banks of some developed countries in 1970s and 1980s. The central element of these systems was that, by using the correlations of the money multiplier, they sought to have a direct influence on the money supply that determines inflation trends in the long run. In line with this they tried to achieve – by adjusting either the central bank money supply or the reserve ratio, or both – that the broader volume of money in the economy reaches the volume and the rate of growth deemed necessary for the proper development of inflation.

Thus, in theory, the money multiplier may have worked in these systems, but the monetary policies that targeted monetary aggregates have not proven successful. It is not the intention of this article to evaluate the various monetary policy systems, but in summary we may state that the largest problem was that the money multiplier model defines only the theoretical maximum of the commercial banks' lending capacity, but there is no guarantee that the banks would use it for lending under any circumstances. In addition, the broader money supplies often follow the changes of the central bank money supply or the reserve ratio only with uncertainty or significant delay, and therefore it is not easy to react properly with these instruments to changes of the economic environment and it is difficult to determine the parameters responsible for the long-term development of inflation.[3] Today, there is hardly any central bank that would try to exert direct and exclusive influence on the development of money supply.

Today's central banks in most developed and emerging countries use some form of inflation targeting, which means directly influencing the economy's interest rate level in a way that the expected price level trends correspond to the inflation target. Since this monetary policy does not wish to assert direct impact on the broader money aggregates, it fits in with such monetary policy instruments that adjust the central bank money supply to the demands of commercial banks, which in this way – under the applicable central bank interest – is practically unlimited.[4]

This means that credit institutions may take unlimited central bank liquidity from the central bank at or close to the central bank base rate against collateral, or deposit unlimited central bank funds with the central bank, in accordance with their needs. And funds originating from the central bank are typically not subject to the reserve requirement, i.e. there is no need to place required reserves for them.

The MNB implements an inflation targeting monetary policy relying on monetary policy instruments influencing the interest rate level of the various financial markets. Considering the entire banking system, the amount of central bank money available for Hungarian banks considerably exceeds their relevant demand,[5] and therefore, as part of the MNB's monetary policy instruments, they may – subject to their own decision – deposit unlimited amounts of liquidity with the central bank in the form of

[3] For details on the monetary policy role of the various monetary aggregates see Komáromi (2008).

[4] This is true even when certain developed central banks issue central bank money through volume tenders, just like e.g. ECB before the crisis. In this latter case the central bank money supply is not unlimited in the true sense of the word, but even then the case is not that the central bank wants to influence the volume of central bank money available for banks to draw down, but rather that it is capable of determining very accurately – relying on its developed forecasting tools – the banks' demand for central bank money at systemic level. If this demand increases, e.g. because banks lend more than previously at systemic level, central banks automatically increase the volume of central bank money offered in the tender.

[5] This condition is referred to as systemic liquidity surplus and it characterises the majority of the countries in the world.

two-week MNB-bills. Thus, domestic banks are able to manage the liquidity demand or liquidity surplus arising as a result of the minimum reserve requirement increase or decrease by reducing or increasing their two-week MNB-bill portfolio. Meanwhile, credit institutions are also protected from interest loss, as the MNB pays central bank base rate both on the banks' required reserves and on the liquidity deposited in two-week MNB-bills.

Box 2: Why does the reserve ratio have no impact on monetary aggregates in modern central banking practice?

In the practice of today's central banks – where central bank money supply priced at the central bank base rate is practically unlimited for commercial banks – the lending of Bank No.1 mentioned in Box 1 can no longer be restricted by the reserve ratio. If the bank wishes to lend 1,000 units rather than 900, it can obtain the remaining 100 units from the central bank. As loans from the central bank are not subject to the reserve requirement, the bank will be under no obligation to increase its already allocated required reserves and can therefore use all the 100 units of central bank funds for lending. This also illustrates the main difference relative to the basic assumption of the money multiplier model: the central bank money supply is not an externally determined (not exogenous) factor for commercial banks, as the central bank loan obtained by Bank No.1 increased the total central bank money supply by 100 units.

Thus, the reserve ratio and the reserve requirement calculated with the help of the former have no impact on the domestic banks' lending activity, the development of broader money supplies or the direction of the monetary policy. The same applies to modern international practice as well, since the primary purpose of reserve requirement systems – utilised by central banks operating with an essentially unlimited supply of central bank money, as is the case in Hungary – is to support the liquidity management of commercial banks and reduce the gap between interbank rates and the central bank base rate.

In November 2008, the MNB reduced the reserve ratio of Hungarian credit institutions from 5% to 2%. The reasons and consequences of this will be described in detail in the next chapter; however, this event provides a good opportunity to present – after the theoretical deduction on real figures as well – the operation of the money multiplier model in the practice of current monetary policy systems.

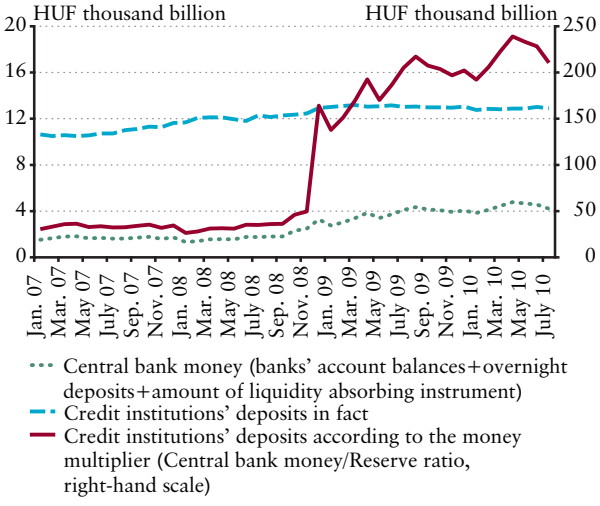
Chart 3 clearly illustrates that, according to the money multiplier model, the volume of commercial bank money, i.e. the sum of all commercial bank deposits, should have significantly exceeded the observed figures already before November 2008, fluctuating somewhere around HUF 30,000-35,000 billion. Afterwards, following the reduction of the reserve ratio in November 2008, based on the simple mathematical correlation presented in Box 1, the volume of commercial bank money should have achieved a sudden increase of 5/2 times or 250 percent, to around HUF 150,000 billion.

However, this obviously did not occur in the longer run either, since – as already presented in theory – the reserve ratio has no impact on the lending and money creation capacity of commercial banks. In reality, the sum of commercial bank funds increased from HUF 10,000 billion to HUF 13,000 billion between 2007 and 2010 along a gradual and even trend, and lowering of the reserve ratio in November 2008 caused no break whatsoever in its development.

Chart 3

Trends in credit institutions' deposits according to the money multiplier and in fact

(month-end figures, 2007–2010)



Source: MNB.

This also means that credit institutions do not necessarily want to have lower reserve ratio; on the contrary – taking into account that the primary function of the reserve requirement is its role as a liquidity buffer – a very low reserve ratio is by no means favourable for banks. Exceptions from this are reserve requirement systems that remunerate reserves at below-the-market interest rates, because due to the income curtailment realised through them, banks are

[6] Similarly to the theoretical deduction, in the case of these calculations as well, we ignored cash balances, but it has no impact on our conclusions here either.

interested in the lowest possible reserve ratio even if this restricts the liquidity buffer function.

Reserve systems paying below-the-market or zero interest are still rather frequent these days. Up until May 2004, the interest the MNB paid on required reserves was slightly lower than the central bank base rate, but then – as mentioned above – it transformed its reserve requirement system to pay market interest, thereby putting an end to the former practice of income curtailment.

LOWERING THE RESERVE RATIO IN NOVEMBER 2008 WAS PART OF CRISIS MANAGEMENT…

From 2002 until November 2008, the MNB applied a 5% reserve ratio, i.e. credit institutions were required to deposit 5% of their reserve funds with the central bank as required reserves. While the definition of reserve funds was already fully identical with the calculation applied by the European Central Bank (ECB) for eurozone banks, the 5% domestic reserve ratio in this period considerably exceeded ECB's 2% reserve ratio.

The difference between Hungarian and eurozone reserve ratios was attributable to the fact that, at the aggregate level, the Hungarian banking system was hit by unexpected liquidity shocks which were proportionately larger than those affecting the Eurozone's banking system. Due to this – in accordance with the findings of previous chapters – a higher reserve ratio was optimal for the domestic banking system in terms of liquidity management, as the liquidity demands of individual banks – and thereby the proportionately more significant fluctuation of the daily closing balance of their central bank account – could be managed more easily with an averaging mechanism that calls for a higher reserve requirement. From mid-2004 onwards, it has been especially true that the higher reserve ratio is ideal for Hungarian banks, when by terminating the interest curtailment via the reserve requirement, the higher ratio practically did not have any disadvantage any longer.

However, on an individual basis domestic banks can basically be allocated into two groups regarding their adequate volume of reserve requirement relative to their liabilities subject to minimum reserve requirements, i.e. the optimal reserve ratio. Under normal market circumstances banks with higher balance sheet totals, and thereby higher reserve base, exposed to smaller fluctuations in liquidity requirements, face no problems in managing their cash flow even with a lower reserve ratio.

As opposed to this, the higher reserve ratio is optimal for banks having clients generating large payment turnover, but – relative to the resulting fluctuation of the central bank account's closing balance – a low balance sheet total, as this way they can maintain an average balance on reserves that is sufficiently high for managing the large liquidity shocks to which they are exposed. Naturally, no sharp division line exists between these two groups, and it also may happen that a bank in certain periods belongs to one of the groups, and then at another time to the other group.

Additionally, we can also interpret the MNB's liquidity management system as allowing Hungarian credit institutions to tie up their central bank liquidity in two instruments, both of which pay central bank base rate: required reserves and two-week MNB-bills. These two instruments, however, have significantly different liquidity profiles. Due to averaging, required reserves are extremely liquid over a few days' horizon, as by varying the central bank account balance they can be practically used freely for managing liquidity shocks at that timescale. However, for longer periods of several weeks, these assets become much less liquid, for they must be maintained on a permanent basis and, regarding individual monthly averages, banks are required to meet their respective reserve requirements. The situation is exactly the opposite in the case of the two-week MNB-bill, as the liquidity it represents will not be available for two weeks. Over the long term, however, it can be freely utilised as it is not an obligation – only an opportunity – for banks to renew their maturing portfolios or certain parts thereof.

It follows from all this that under normal market circumstances – when the trend of central bank liquidity for the entire system is quantifiable for the longer run and banks generally face short-term unexpected liquidity shocks of varying directions – banks tend to prefer a sufficiently high reserve requirement due to its short-term liquidity buffer role. Nevertheless, as described above, these sufficiently high reserve ratios may differ significantly high for banks with different payment turnover profiles. This article has so far dealt mainly with this situation with regards to the role of the reserve requirement system.

In November 2008, however, an entirely different situation emerged due to the global crisis which affected the domestic financial markets as well. At that time, several banks were hit by large-scale, lasting and unidirectional liquidity-absorbing shocks due to the drastic fall in the liquidity of the forint interbank market and their foreign exchange swap exposures, as a result of which they were faced by a deficit in forint liquidity. At that time, the high required reserve – less liquid in the longer run – was already not advantageous for these banks. Moreover, the majority of these banks were

among those able to handle the fluctuation of their central bank account balance easily even under lower reserve requirements. Thus, due to the freezing up of the forint interbank market – i.e. the shortage of loans available from other banks – which occurred at the same time, the considerable forint funds tied up as required reserves owing to the relatively high 5% reserve ratio, already represented a factor hindering liquidity management for these banks with a forint liquidity deficit.

Taking this into account, in November 2008 the MNB lowered the reserve ratio in a single step to 2%, the ratio that is also applied in the euro area. The reduction of the reserve ratio (together with the other central bank measures introduced then, e.g. the significant expansion of the range and volume of eligible collaterals, the narrowing of the interest corridor and the central bank instruments of various tenors providing foreign exchange liquidity) was able to increase the freely utilisable forint liquidity of the aforementioned credit institutions, thereby mitigating the liquidity stresses on the individual banks and the forint interbank market.

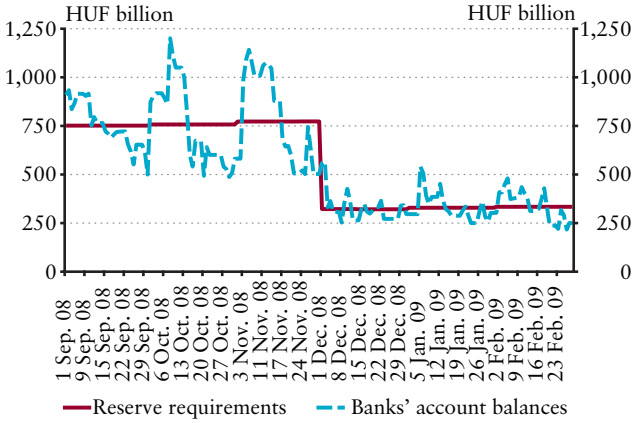
It should be pointed out, though, that the factors hindering the reduction of the reserve ratio at an earlier time (i.e. frequent events generating relatively high unexpected liquidity deficit or liquidity surplus) were present in the autumn of 2008 as well, but – due to the longer-than-usual, unidirectional, liquidity-absorbing shock – these were superseded by the banks' requirement to obtain sufficient volume of forint liquidity. Thus, lowering of the reserve ratio in November 2008 was a measure suitable for remedying an important problem and could be executed quickly under the extraordinary circumstances. It still holds true though that with the lower reserve requirement, credit institutions are able to manage significant, system-wide liquidity shocks only by tighter liquidity management and possibly more frequent utilisation of the central bank overnight standing facilities (overnight deposit and loan).

This is because as a result of reducing the reserve ratio from 5% to 2%, the reserve requirements of all domestic banks fell by 60 percent (from HUF 770 billion to HUF 320 billion at the aggregate level) as of the December 2008 reserve maintenance period. This was accompanied by the proportionate narrowing of the limits of the credit institutions' central bank account balance fluctuations, i.e. the scope for managing unexpected liquidity impacts decreased (Chart 4). The problem was exacerbated by the fact that due to the significant fall in interbank market liquidity, after the reduction of the reserve ratio banks could rely on the market to lesser extent than before, which generated further difficulties for banks with relatively high payment turnover, which had already pursued a relatively stressed liquidity management regime.

Chart 4

Fluctuation of credit institutions' account balances around the aggregate sum of reserve requirements

(September 2008–February 2009)



Source: MNB.

… BUT IT COULD GENERATE LIQUIDITY MANAGEMENT FRICTIONS OVER THE LONGER RUN

Thus, in theory the lower reserve ratio could have, in its own right, weakened the efficient operation of monetary policy instruments, as in the case of an illiquid forint interbank market it results in the more active utilisation of the central bank's overnight instruments and thereby lasting deviation of interbank forint interest rates from the central bank base rate. The decision as to whether – due to the relatively low reserve ratio – the overnight deposit or the loan instrument is used, primarily depends on the prudence level of banks' liquidity management. In the following section, we analyse to what extent the significantly increased utilisation of the central bank's overnight instruments during the crisis period was attributable to the lower reserve ratio.

If all banks have considerable liquidity surplus, but their liquidity management behaviour is still characterised by enhanced, or even exaggerated, prudence, then they buy fewer 2-week MNB-bills than would be reasonable, and they place their freely utilisable liquidity – above the reserve requirement – in overnight deposits. This attitude is loss-making for banks, since under the present width of the interest corridor the MNB pays by 1 percentage point lower interest on overnight deposits than on the 2-week MNB-bill. Despite this, between November 2008 and November 2009 – for an entire year – this was practically the standard behaviour in the Hungarian banking sector.

For the period following the outbreak of the crisis and the drying up of the interbank money market there may be several explanations why banks followed this loss-making approach; one of these is supported precisely by the excessively low level of the reserve ratio. Namely, if a bank's funds allocated as reserve requirement are insufficient for neutralising unexpected liquidity impacts by the fluctuation of its current account balance (i.e. it is unable to reduce its account balance sufficiently below its reserve requirement, as the reserve requirement is already too low as well), it can remedy the situation by accumulating overnight deposits. The accumulated deposit portfolio in such cases works as a real liquidity buffer, as it expires daily and the bank in question can decide daily to decrease or increase it as a function of the actual liquidity demand or liquidity surplus. Thus, the overnight deposit portfolio supplements the reserve requirement account, thereby practically enabling the bank to increase the required reserves, set too low for it. Naturally, this is loss-making for the bank compared with the situation where the required reserve level – earning market interest – would be indeed higher.

However, in an uncertain liquidity and interbank market situation it is possible that banks would rather accept this loss in order to ensure calculable and comfortable liquidity management. Moreover, between October 2008 and November 2009 there was a narrower, +/-50-basis point interest corridor, which halved the potential loss of this liquidity management behaviour, thereby reducing banks' incentives to liquidate their overnight deposit portfolio. The accumulation of the significant overnight deposit portfolio is unfavourable for the MNB as well, because then the interbank market is dominated by the overnight deposit interest, which is lower than the key policy rate, which could distort the interest transmission.

Since after the outbreak of the crisis and the drying of the interbank money market many different reasons could jointly lead to the significant increase of the overnight deposit portfolio,[7] based on the experiences of the 2008-2009 period it could not be decided beyond any doubt whether the 2% reserve ratio was indeed too low. In our survey conducted in autumn 2009 we came to the conclusion that during 2008-2009 the stagnation of the overnight deposit portfolio at a high level was not primarily due to the reduction of the reserve ratio, but rather to the change in banks' liquidity management preferences. The main reason for this could be the decrease in the interbank markets' liquidity. On the other hand, due to the narrower interest corridor, the motivation to use the interbank market was indeed lower, which further reduced the liquidity thereof.

At the same time, it could also not be ruled out that the reduction of the reserve ratio did contribute to the sudden increase of the overnight deposit portfolio. According to our findings, the reduction of the reserve ratio in accordance with the theoretical considerations could cause the deliberate increase of the overnight deposit portfolio primarily in the case of those banks that could make use of the reserve system's averaging mechanism to a lesser extent than before (i.e. banks with relatively high payment turnover).

Following the reinstatement of the interest corridor to its previous width of ±100 basis points in November 2009, the overnight central bank deposit portfolio decreased considerably. This is because thereafter banks made greater efforts to ensure that the MNB-bill portfolio which they purchased approximated the optimal level in terms of liquidity management. As a result of this, interbank market turnover increased and the average value of the overnight interbank interest rate also came closer to the middle of the interest corridor. These changes resulted in a situation which provides an opportunity for a more in-depth evaluation of the reserve ratio level. This is because if banks purchase the volume of 2-week MNB-bills corresponding to the expected liquidity situation and do not keep overnight deposits, then they can manage unexpected liquidity impacts occurring between two MNB-bill auctions in two ways.

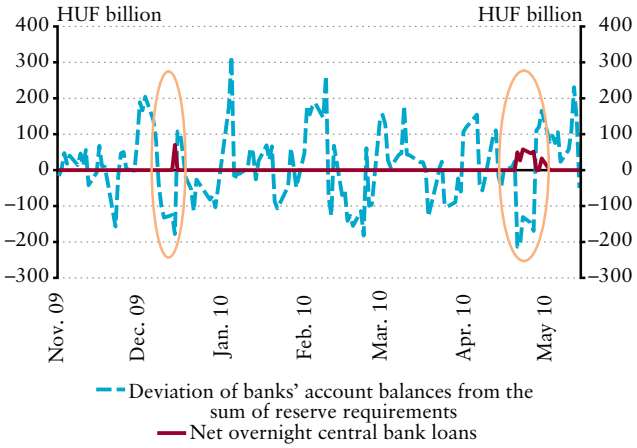
If the reserve ratio level is adequate, the credit institutions are practically able to fully manage a systemic unexpected liquidity absorbing shock by reducing their account balance, without the need to take overnight loans. However, if the reserve ratio level is too low for most of the banks, these banks will not be able to reduce their account balance by the appropriate extent, thus – in order to manage the systemic liquidity absorbing shock – temporarily (until the next 2-week MNB-bill auction) they may be forced to take overnight loans in the beginning of the reserve period, or even in the middle of it. Thus, from the amount of the net overnight loans taken during the unexpected banking system-level liquidity absorbing shocks that occurred since November 2009, we may make conclusions whether the low reserve ratio represents a problem.

Since last November there were two occasions when we experienced that – as a result of unexpected liquidity absorbing shocks – certain banks were forced to take large

[7] During the crisis other instruments introduced by MNB also contributed to the increase of liquidity surplus, and the payments made from the treasury account – fundamentally influencing the liquidity of the banking system – also increased the banking system's liquidity gradually.

Chart 5

Fluctuation of banks' account balances and the amount of net overnight central bank loans



Source: MNB.

overnight loans in the middle of the reserve period, despite the fact that at the systemic level the banks' central bank account balance decreased by an unprecedented extent (Chart 5). In mid-December 2009 for a few days the domestic credit institutions' central bank account balance decreased to a level that was by HUF 100-180 billion lower than the prevailing HUF 340 billion required reserve amount of the individual banks. Despite this, on 15 December over HUF 70 billion in net overnight central bank loans was drawn down. In mid-April 2010, banks' central bank account balance lagged behind the HUF 350 billion aggregate required reserves by HUF 150-200 billion, and then the domestic banks were forced to take large overnight central bank loans on five subsequent days, the net daily amount of which fluctuated around HUF 50 billion.

In the two periods mentioned, typically those banks were forced to take overnight central bank loans that had to manage a significant payment turnover in these periods relative to the size of their reserve requirements. Several of these banks – despite their relatively low balance sheet total – are, under normal circumstances, considered as key players providing liquidity in several interbank markets. Comparing the average overnight loan amounts taken by them with the size of their reserve requirements we may state that in terms of liquidity management the previous, 5% level of the reserve ratio is possibly closer to the optimal level for these banks, than the 2% ratio introduced in November 2008.

Based on the borrowing figures of the two periods in 2010, characterised by a stressed liquidity situation, the 2% value of the reserve ratio as a matter of fact limited the resistance of banks with relatively large payment turnover to unexpected liquidity absorbing impacts. The liquidity management frictions of these banks – due to their significant interbank market activity and the lower liquidity of the interbank market than before the crisis – have a systemic impact as well at the time of unexpected liquidity shocks, since the overnight interbank return – due to the banks' liquidity management limits – in such cases almost always swings up to the upper edge of the interest corridor. Interbank interest rates being permanently at the top of the interest corridor may distort the interest transmission in the same way as interest rates stuck at the bottom of the corridor. Even if the high interbank interest rate does not prove to be lasting, it may motivate banks to pursue the former, overly cautious liquidity management, i.e. to once again accumulate considerable overnight deposit portfolios, for which we saw several examples again in recent months. Thus, there is little chance that we shall have a stable interbank interest around the central bank base rate, which was the case before the crisis, and instead interest rates will either fluctuate with large volatility between the bottom and the top of the corridor, or they will stick to the bottom of the corridor permanently.

CONCLUSIONS: INTRODUCTION OF THE OPTIONAL RESERVE RATIOS COULD ENHANCE THE EFFICIENCY OF THE RESERVE REQUIREMENT SYSTEM

The temporary forint liquidity shortage situation – giving rise to the reduction of the reserve ratio in November 2008 – which appeared at certain banks as a result of the crisis, and the considerable shrinkage of the interbank markets' liquidity ceased starting from the end of 2008 and due to the generally ample forint liquidity surplus both at the systemic and the individual bank level no similar situation is expected to arise in the medium term. As a result of this, in order to mitigate the liquidity management frictions generated by the low reserve ratio – as described in the previous chapter – the idea of reinstating the ratio to its previous 5% level could have come up as an evident solution. This would have significantly assisted the liquidity management of domestic banks with relatively large payment turnover, while – in terms of liquidity management – it would have had neutral effect on banks with relatively high balance sheet total.

The argument against a uniform increase in the reserve ratio to 5% is that according to the experiences of the period starting from November 2008, the 2% reserve ratio provided many banks with an adequate scope for efficient liquidity management. In the longer run it cannot be completely ruled out that lasting, single-direction liquidity

absorbing shocks – similar to those at the end of 2008 – may arise in the domestic banking system or at certain credit institutions, giving rise to a sudden and significant increase in forint liquidity demands. In such cases, it is advantageous if no high forint liquidity is tied up unnecessarily in required reserves in the case of banks that otherwise can adequately manage the shocks occurring in their payment turnover even with a lower reserve ratio.

It is also worth considering that following the introduction of euro in Hungary, the domestic banks will also be subject to ECB's minimum reserve requirements, i.e. if we do not expect changes in ECB's requirements, they will be subject to a 2% reserve ratio. Although the exact date of introducing euro in Hungary is uncertain, and until then the MNB wishes to apply a reserve regulation that takes account of the Hungarian specialities, it makes no sense to oblige those banks for which the 2% value is optimal already at present to return to the higher reserve ratio.

As we saw it, all in all it was not the specific rate of the reserve ratio either before or after November 2008 that hindered the reserve requirement system in providing even more efficient support to banks' liquidity management and thereby facilitating even more the narrowing of the gap between the interbank rates and the central bank base rate. The main hindering factor was that the uniform reserve ratio applicable to all banks makes the reserve requirement system too inflexible. Prior to November 2008 the required reserve amount was already too high – in terms of liquidity management – for some banks, while thereafter it was too low for some other banks. It should be emphasised that we cannot differentiate banks in terms of quality based on whether the lower or the higher reserve ratio is more favourable for them in terms of liquidity management, as this is influenced by many unique, equally acceptable business policy and other decisions, as well as circumstances that appear for the bank as a condition, which – moreover – with time may also change in the case of a specific bank.

Nevertheless, the lesson learnt from the period since November 2008 is that with a uniform reserve ratio the reserve requirement system is less capable of accomplishing its original objective, i.e. to support the liquidity management of domestic credit institutions and narrow the gap between the interbank rates and the central bank base rate, than if each bank's required reserve amount can approximate the value which is individually optimal for the bank in question.

This latter can be achieved most easily if – under an unchanged reserve base and subject to certain predefined limits – each bank applies a reserve ratio that corresponds to its own balance sheet total and payment turnover features. Accordingly, as of the reserve maintenance period commencing in November 2010 each Hungarian credit institution may decide on its own whether it applies the 2% ratio applicable before or to a higher one. Credit institutions may select from reserve ratios of 2, 3, 4 and 5%, and they may change their choice semi-annually.

With the introduction of the optional higher reserve ratio, the MNB wishes to remedy the asymmetry that has existed so far in the reserve requirement system as a result of the uniform reserve ratio. This could ensure that in the future the reserve requirement system supports the liquidity management of all domestic credit institutions with appropriate efficiency and thereby contributes to the largest possible extent to narrowing the gap between the interbank rates and the central bank base rate. It is worth considering choosing a reserve ratio higher than the present 2% for those banks that for the optimal management of the liquidity shocks affecting them may need the wider scope of central bank account balance fluctuation provided by the higher reserve requirement.

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