MAGYAR NEMZETI BANK

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Contents

Summary

DEAR READER,

The October 2010 issue of the MNB Bulletin contains six articles which are currently of particular relevance and topicality. The authors examine the possibility of converting FX loans into forint loans, provide a regional analysis of the decline in corporate lending and present an overview of the potentials and limitations of non-governmental forint bond issues by non-residents. In addition, they make an attempt to estimate what the tax revenue will amount to once the economic cycle reverses, summarise the experiences of European crisis management and present reasons for introducing the optional reserve ratio.

The article by Tamás Balás and Márton Nagy examines in detail the costs and consequences of a conversion of FX loans into forint loans. At the end of their analysis, the authors conclude that a quick conversion would not be able to put an end to the vulnerability arising from the high level of Hungary's FX-based debt. Although the government or the central bank would be able to take over the FX-based open positions of households without the immediate weakening of the forint's exchange rate, indirectly, the high exchange rate risk assumed by the consolidated general government (including the central bank) may still lead to the weakening of the exchange rate.

The article by Gergely Fábián, András Hudecz and Gábor Szigel provides a regional comparison of the decline in corporate lending and its background. The experts find that the higher a country's net external indebtedness, the less inclined non-resident investors and owners are to provide additional funds to the country's banks – and hence, firms. Shrinking credit supply may thus have contributed more significantly to the decline in corporate lending in Hungary than in other countries of the region.

The article by Ákos Gereben and István Mák analyses the potentials and limitations of non-governmental forint bond issues by non-residents. According to the authors, in the long run, the Hungarian banking system will only be able to capitalise on tapping the euroforint market and draw on forint funds with longer re-pricing periods abroad if indebtedness in forint becomes attractive to domestic borrowers, and concurrently foreign savers and investors consider the macroeconomic prospects sufficiently reliable and appealing to assume the exchange rate risk.

The article by Gergely Kiss summarises European crisis management experiences and presents the efforts made with a view to reforming economic policy coordination. The expert believes that decision-makers are firmly determined to adopt economic policy coordination mechanisms far more efficient than the ones currently in place. Rules governing crisis management will be certainly clearer; however, in order to minimise moral hazard, the common European Rescue Package will continue to have a big price tag.

The article by Gábor P. Kiss and Zoltán Reppa focuses on the methods used to estimate the tax revenue to be collected by the general government once the economic cycle reverses. Regarding the estimation of the cyclical gaps of macroeconomic variables, the article presents the outcomes of three methods, all characterised by the fact that besides the output gap, they also take into account the trend and cycle of the macroeconomic variables determining the main tax bases.

The article by Lóránt Varga focuses on the introduction of the optional reserve ratio and the ways in which it could improve the efficiency of the reserve requirement system and narrow the gap between short-term interbank returns and the base rate. 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 may ensure that in the future the required reserve ratio system supports the liquidity management of all domestic credit institutions with improved efficiency and thereby contributes to the largest possible extent to narrowing the gap between interbank returns and the base rate.

The Editorial Board

Tamás Balás and Márton Nagy: Conversion of foreign currency loans into forints

Foreign currency lending to households, which entered an exceptionally dynamic phase in 2004, has reduced the efficiency of monetary policy, and the rather high share of foreign currency loans has now become a source of risks to financial stability. As this high share of FX loans will only decline slowly, we will have to face the resulting problems for a long time. In recent years, the Magyar Nemzeti Bank (MNB) pointed out these problems at numerous forums, including in its Report on Financial Stability. One of the most obvious tools to mitigate the risks arising from foreign currency debt would be quick conversion into forint loans. In such a case there is a transfer of costs and exchange rate risks between the different economic actors. The transfer of costs stems from the fact that debtors will only be willing to convert their foreign currency debt into forint loans if the instalments remain unchanged or are lower. In addition, conversion also entails the transfer of exchange rate risks, as households' open FX positions would be 'purchased' by another sector. Therefore, no conversion technique exists that could reduce risks. On the contrary: by having the government or the central bank take over the open FX positions of households it would only increase vulnerability and add to the real economic costs. The risks stemming from foreign currency debt can only be mitigated by macro-economic stability, i.e. low inflation and an economic policy that improves both external and internal equilibrium.

RAPID ACCUMULATION OF HOUSEHOLD DEBT DENOMINATED IN FOREIGN CURRENCIES

At the end of the first half of 2010, Hungarian household debt was close to HUF 10,600 billion (40% of GDP). Within this, foreign currency loans amounted to HUF 7,300 billion (or 28% of GDP), which is two-thirds of the total debt (Table 1). This high share was reached in the second half of 2008; since then it has been stagnating or slightly decreasing. Over 90 per cent of foreign currency debt is denominated in Swiss franc and approximately 7 per cent in euro.

There were three major stages in the accumulation of the high volume of foreign currency debt. This type of household lending appeared in Hungary in 2000, initially for car purchase financing. In the period 2000–2003, car purchase loans were almost exclusively responsible for growth of foreign currency debt. Home loans of this type started to gain ground in 2004, after tightening of the housing subsidy scheme, which essentially meant discontinuation of the programme. Soon afterwards, in 2004 and 2005, home equity loans were introduced, which gave new momentum to the build-up of foreign currency household debt. The sharpest increase in foreign currency lending was experienced between 2006 and 2008, despite the fact that the central bank pointed out the associated risks on a number of occasions and forums. Of the new lending on the whole, the share of foreign currency loans had risen to 80 per cent by the end of 2008 and the corresponding figure for mortgage loans was over 90 per cent. In response to the global financial crisis, the growth of foreign currency debt ceased by the end of 2008 and then started to decline.

Table 1

Household debt and number of contracts as of 30 June 2010

	Outstanding amount (HUF Bn)			Number of contracts (in thousands)*		
	HUF	FX	Total	HUF	FX	Total
Households' total loans	3,333	7,266	10,599	2,800	5,600	8,400
from which mortgage loans	1,667	5,474	7,141	300	1,000	1,300
from which housing loans	1,527	3,089	4,616	295	550	845

Note: The number of contracts is based on estimates.
Source: MNB.

Chart 1

Share of foreign currency debt versus total and newly disbursed household loans in an international comparison

Proportion of FX loan within the outstanding amount

Proportion of FX loan within the new contracts
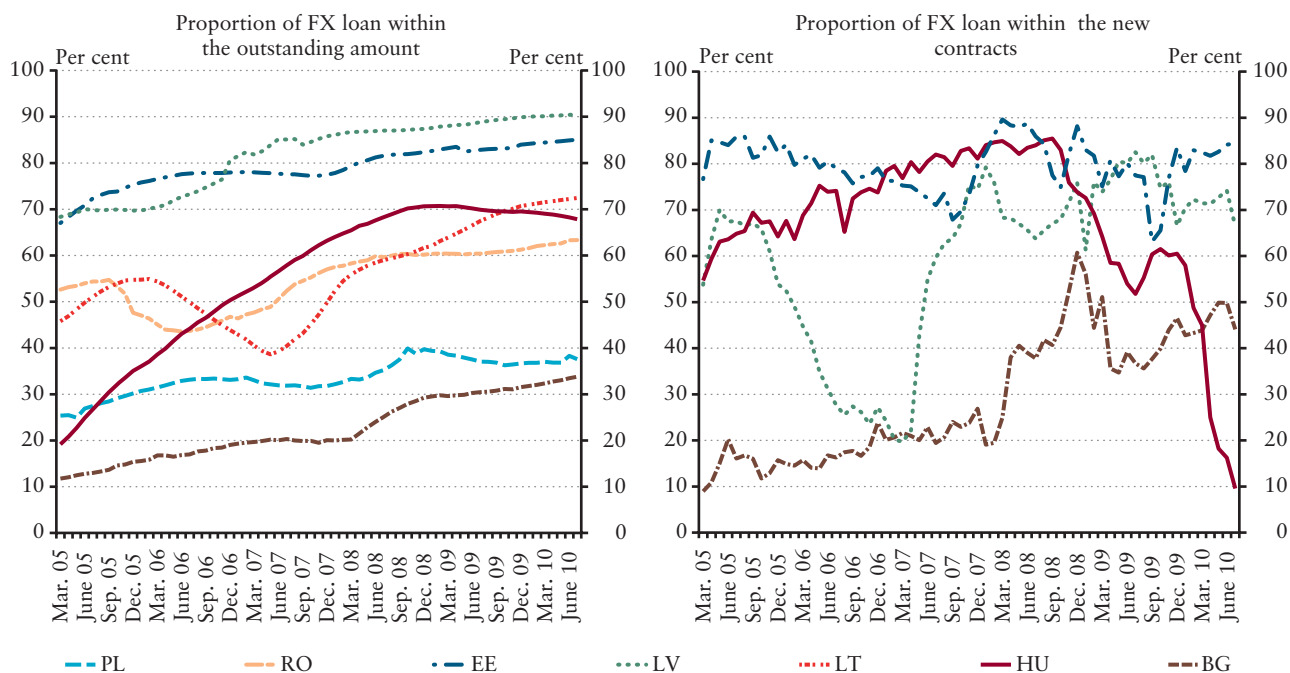
Note: The share in new loans is a three months' average.

Source: National central banks.

By regional comparison, the 70 per cent share of foreign currency loans of Hungarian households is high and is only exceeded by the Baltic States (see Chart 1). The corresponding figure for the Czech Republic and Slovakia is below 1 per cent.[1] Not only the share of foreign currency loans, but also their growth rate was exceptionally high in Hungary between 2004 and 2008. Nowhere else in the region did foreign currency lending grow so fast for such a long time compared with local currency loans. After the fast spread, foreign currency lending in Hungary experienced a likewise fast winding-off as contracts for new loans reveal.

WHAT WERE THE CAUSES OF SPREADING FOREIGN CURRENCY LENDING?

The underlying reasons (see Chart 2) for the surge in foreign currency lending is an issue addressed by a number of domestic and international papers. One of the conditions for foreign currency lending is the free capital flow, which has gradua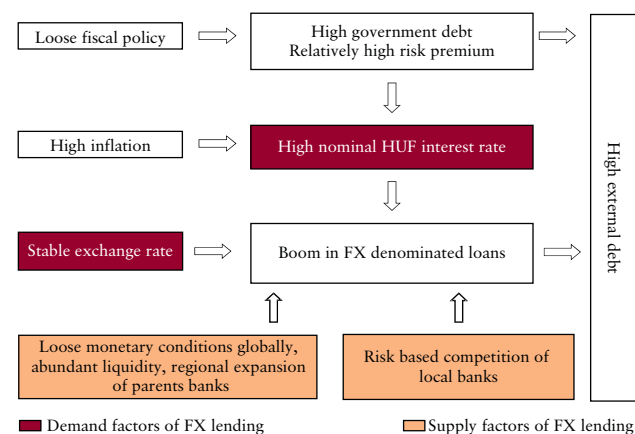lly become the case through the European integration process. Literature cites the difference between local and foreign currency interest rates as one of the engines driving foreign currency lending (Basso et al., 2007; Rosenberg–Tirpák, 2008; Csajbók et al., 2009; Oblath,

Chart 2

Underlying reasons for the emergence of foreign currency lending

2010; Bihari and Valentinyi, 2010). As the covered interest parity does not necessarily hold in the short run, it is the nominal interest rate differential that affects households' borrowing decisions.

In Hungary a loose fiscal policy and high government debt contributed to a notable difference in interest rates through

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[1] The share of foreign currency retail loans was only 2.7 per cent prior to Slovakia's adoption of the euro.

an increased sovereign risk premium. Higher inflation accompanying the convergence process also resulted in higher nominal domestic interest rates, which also translated into higher nominal interest rate differentials.

Research findings by Csajbók et al. (2009) point to other factors that also played an equally important role in the emergence of foreign currency lending. The study provides empirical evidence that, if households have access to long-term loans denominated in the local currency at a fixed interest rate, it curbs indebtedness in foreign currencies. To this end, banks must be able to offer long-term local-currency loans, which in turn requires predictable and sizeable domestic savings over the long term. The absence of fiscal incentives eroded the viability of forint mortgage bonds and, hence, fixed-rate forint loans. This, in turn, gave further impetus to the spread of foreign currency lending.

The stable exchange rate of the forint, attributable to the narrow currency band that was in place until 2008, probably also played a role in the rapid expansion of foreign currency lending in Hungary. It is not a coincidence that the MNB was regularly arguing for the introduction of a floating exchange rate regime before 2008.

Finally, a number of analyses, including those by Banai et al. (2010),[2] argued that the expansion of parent banks in the region, the excess supply of liquidity and risk-based competition by banks on the supply side were also conducive to the accumulation of foreign currency debt. Over the past decade, the business policy of domestic banks was based on acquiring an ever growing number of clients while exposing themselves to an increasingly large amount of risk (i.e. offering riskier products and accepting subprime clients).

HOW LONG WILL WE HAVE TO LIVE WITH THIS HIGH PROPORTION OF FOREIGN CURRENCY LOANS?

The driving forces behind foreign currency lending before 2008 faded significantly in Hungary after the onset of the financial crisis in October 2008. The economic downturn led to a worsening in households' income expectations. Parallel to a balance sheet adjustment by the banks, global liquidity was drying up. As a result, the refunding of foreign currency loans became more expensive and funds were harder to come by. Dramatic portfolio deterioration put an end to risk-based competition. Lower inflation and fiscal tightening also contributed to lowering the difference between forint and foreign currency interest rates. Effective

Chart 3

Developments in newly disbursed household loans
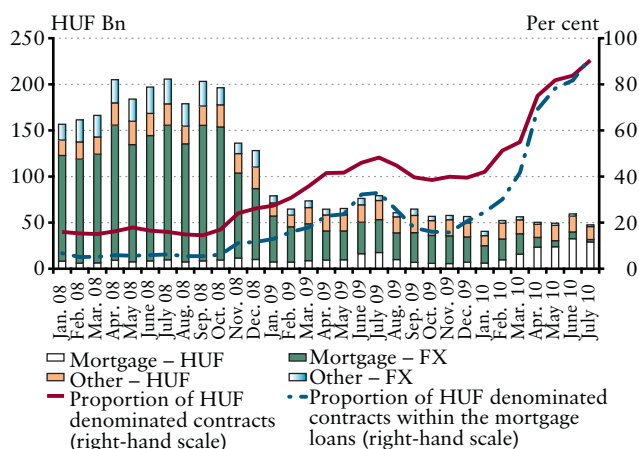
Source: MNB.

from March 2010, a government decree on prudent lending as well as the act on the prohibition of foreign currency lending, which went into force in August, were also crucial in restricting foreign currency lending. The currency makeup of new lending soon followed suit and forint lending is now prevalent (See Chart 3).

Nevertheless, this latest advance for forint loans only exerts a limited impact on the currency composition of foreign currency debt, as new originations have fallen to one-third or a quarter of earlier figures. Because of the high share of mortgage loans with an average remaining maturity of 15 years, the existing foreign currency debt will take rather

Chart 4

Decline in foreign currency household debt without newly issued loans or pre-payments
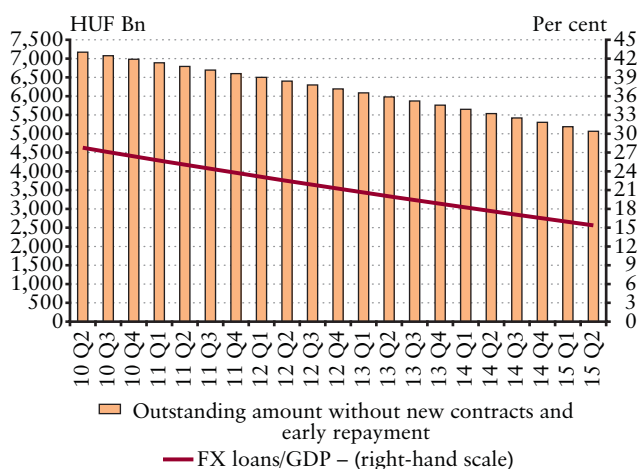
Source: MNB and the authors' own estimates.

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[2] Ádám Banai–Júlia Király–Márton Nagy (2010): The demise of the golden age in Hungary. ("Foreign" and "local" banks – before and after the crisis) *Közgazdasági szemle,* Volume LVII, February 2010, pp. 105-131.

long to diminish. Based on our approximate estimates, provided that no new foreign currency loans are issued, it would take 5 years for the current portfolio to shrink by 30 to 35 percent (see Chart 4).

Without new issuance and assuming annual economic growth of four percent, it would take five years for Hungary's foreign currency debt to decrease from 24 percent of GDP to 13 percent. Thus, the stronger the economic growth the sooner the problem posed by foreign currency lending can disappear.

WHY IS THE HIGH PROPORTION OF FOREIGN CURRENCY DEBT REGARDED AS A PROBLEM?

A high share of foreign currency loans significantly impairs the efficiency of both exchange rate and interest rate channels of monetary transmission. As a rule, a weaker forint improves the competitiveness of export-oriented companies, which in turn stimulates output. However, a weaker exchange rate can also restrain growth due to the high share of foreign currency debt, through the net worth of the real and the financial sector. Due to the high share of foreign currency loans, a weaker forint would reduce disposable income due to higher loan instalments, while the resulting higher foreign currency debt would lead to a decrease in wealth of the private sector and, within that, of the household sector.

A weaker forint may also adversely affect banks' net worth, but the degree to which a weaker exchange rate might restrain economic growth depends on financial institutions' ability and willingness to lend. The stronger the banking sector's liquidity and capital position, the less economic growth is impeded by depreciation. If a deteriorating liquidity and capital position limits banks' ability to lend, financial institutions reduce their lending, which may in turn result in lower economic growth. Lower growth may impair banks' liquidity position and the quality of their client portfolio, to which the banking industry responds by further tightening of lending conditions, thereby further weakening economic performance. An accelerating negative spiral may lead to a deep recession.

Not only do foreign currency loans weaken the exchange rate and the interest rate channel of monetary transmission: the larger the weight of foreign currency loans, the smaller impact a change in the central bank's base rate is likely to exert on loan origination, because the central bank's interest rate policy cannot influence the interest rates of foreign currency lending products. However, a rate hike increases the difference between the interest rate applied to local currency loans and those denominated in a foreign currency, which may fuel demand for the latter as they might seem "relatively affordable". No domestic research on the strength of the interest rate channel is currently available. Brzoza-Brzezina et al. (2010) propose that a rise in the central bank base rate reduces lending in the region and, hence, in Hungary. However, the rising volume of foreign currency debt significantly reduces the elasticity of the domestic rate (its impact on loan issuance). In Hungary, whenever the base rate is raised, 50 to 60 per cent of the decrease in forint debt is offset by a rise in foreign currency debt.

Besides weakening monetary transmission, a high proportion of foreign currency loans also poses an increased risk to financial stability. A weaker exchange rate quickly translates into higher monthly instalments. Higher instalments weaken debtors' ability to pay and increase the probability of default (PD).

A weaker exchange rate also erodes coverage for mortgage loans. The loan-to-value ratio (LTV) represents the HUF value of the foreign currency loan versus the price of the given property. If the exchange rate of the forint weakens, the loan-to-value ratio also deteriorates, i.e. it increases. This means that if loans are defaulted, loss-given default (LGD) will be higher. Based on the above, a weaker exchange rate – through a higher probability of default and higher losses – increases loan losses (PD x LGD).

On the other hand, a weaker exchange may also increase banks' earnings because the HUF value of the interest-bearing foreign currency assets forming the basis for interest income rises. However, this impact is lower than that of higher loan losses.

A weaker HUF exchange rate reduces the amount of the available capital while it increases the risk weighted balance sheet total. A dominant part of the balance sheet total is denominated in foreign currency; as a result, a weaker exchange rate may increase risk weighted assets (RWA) and thereby reduce the capital adequacy ratio. Overall, depreciation deteriorates banks' profitability and capital position, which is adverse to financial stability.

A weaker exchange rate may give rise to both solvency and liquidity problems. The maturity of foreign currency loans is longer than that of the foreign currency funds financing them or the foreign currency swaps which swap forint funds for foreign currency liquidity (maturity mismatch). The maintenance and roll-over of foreign currency swaps require considerable forint liquidity. A weaker exchange rate increases the HUF value of the forward leg of the existing foreign currency swaps, and as a result, many banks must respond to margin calls by providing additional foreign

currency margin requirements. Due to the depreciation of the forint exchange rate, and because of the requirements of a margin call, forint liquidity decreases and the foreign currency swap portfolio rises further.

WHAT WOULD BE THE IMPACT OF CONVERSION OF ALL FOREIGN CURRENCY HOUSEHOLD LOANS INTO FORINT?

As households' foreign currency debt takes long to decline, the related risks are likely to persist for a long time. While the conversion of foreign currency debt into forints may seem an obvious option, as we will see, due to the associated transfer of cost and exchange rate risk, this would not merely fail to reduce the vulnerability of the economy and, hence, the country; it would actually increase it.

Economic actors have varying interests in relation to conversion

The interests and willingness of households, banks, the government and the central bank vary widely in relation to conversion of foreign currency debt into forints. Households will only be interested in conversion if the expected burden of repayment for the foreign currency loans consistently exceed that of forint loans of the same initial amount and term. As, however, households borrowed at different exchange rates, their future exchange rate and interest rate expectations and thus their willingness to bear costs may also vary.

One major consideration in banks' decisions is the potential earnings of a product, i.e. whether it is foreign currency or forint loans that offer a higher margin. Another important factor is the extent of deterioration in the portfolio that banks anticipate as a result of exchange rate depreciation if no conversion takes place. In addition to credit risks, they also take into consideration the liquidity risks stemming from a declining, yet still high foreign currency swap portfolio. Here again, there is the problem that portfolio quality, liquidity position and profitability vary from bank to bank, and therefore, they would only be willing to convert under different terms.

In addition to financial stability, the government also has social aspects to consider. Currently, several million individuals have some form of foreign currency debt, and approximately one million people have mortgage loans. Depreciation of the forint's exchange rate increases the number of debtors defaulting on their foreign currency loans, which – by the foreclosure of the property serving as collateral – would lead to serious social problems and have adverse fiscal implications.

The central bank may want to contemplate the viability of conversion in order to enhance the efficiency of monetary transmission and mitigate risks to financial stability.

Conversion of foreign currency debt into forints entails significant cost transfers between the different sectors of the economy

Conversion of foreign currency loans into forints results in significant costs. To a large extent, the cost of converting household loans depends on the exchange rate, at which conversion is to take place, as well as the interest rate applied and maturity. It also depends on what percentage of all foreign currency debt is affected by the conversion. Debtors will only be willing to have their foreign currency loans converted into forint debt if their monthly instalments remain unchanged or are lower. If a fixed volume of foreign currency debt is converted and maturity does not change, the lowest estimate for costs is the cost of conversion at the current exchange rate and foreign currency interest rate, because in this case instalments remain unchanged. Naturally, if instalments decrease, costs will be higher.

The costs stemming from exchange rate differences depend on the rate of exchange applied to conversion. The lower limit means a conversion at the current rate, in which case there are no exchange rate-related costs. If, however,

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Table 2

Costs arising from exchange rate differentials, provided that the entire foreign currency debt portfolio is converted

(30 June 2010)

| | Costs from the change in exchange rate | |
	HUF Bn	as percentage of GDP
Households' total FX denominated loans	1,354	5.2%
from which mortgage loans	925	3.5%
from which housing loans	506	1.9%

Source: Authors' own estimates.

conversion occurs at a rate that is more advantageous for the debtor, costs may increase markedly. According to 2008 figures, the majority of households (60 to 70 percent) borrowed in an exchange rate range of CHF/HUF 150 to 165. If debt were converted at the exchange rate effective at the time of borrowing, costs would be significantly higher, amounting to 1.9 to 5.2 percent of GDP (the calculation assumes an exchange rate of CHF/HUF 210, see Table 2).

The cost pertaining to interest rate differentials is the product of the difference between the APRs of forint and Swiss franc loans, and the HUF value of all foreign currency debt. The total cost is the net present value of these current and future payments (until maturity).

What also matters is whether the interest rate differential is calculated at the foreign currency interest rate prevailing at the time of borrowing or at the current rate. The average APR on Swiss franc loans when most were taken out was around 6 percent for home loans and 7 percent for home equity loans. Corresponding figures were 7.7 and 8.4 percent, respectively, at the end of June 2010. A difference of 140 to 170 basis points translates into an approximately 20 percent difference in instalments.

We have examined two scenarios. One takes into account the Swiss franc interest rate effective at the time of borrowing, the other the current Swiss franc interest rates (spot and forward). In the first scenario, the Swiss franc interest rate is fixed (households expect the interest rate to revert to the original value and stay there). In the second, it is a floating rate (on the basis of the current forward yield curve). Accordingly, we consider interest on newly originated forint loans fixed in the first scenario and floating in the second. We assume that the current maturity remains unchanged; therefore, we use the average remaining

maturity of the existing debt portfolio, i.e. 15 years, in our calculations. We based our calculations on the interest rate, exchange rate and portfolio data that were effective at the end of the first half of 2010.

Since the end of 2009, with Swiss franc loans taking an increasingly low profile and interest on newly originated euro loans increasing, a new wave of low-interest forint mortgage loans has become available. Due to cuts in the central bank base rate, interest on these products is now below 10 per cent. Nevertheless, compared to the initial APR of Swiss franc loans, the APR of newly issued forint loans is 3.3 percentage points higher for housing loans and 2.6 percentage points higher for home equity loans. As for other loans (the majority of which is car purchase loans), the difference is even higher, exceeding 7 percentage points.[3] Thus, the present value of the cost of conversion would be very high: it would exceed 2 percent of GDP, and would be close to 7 percent if the entire foreign currency debt portfolio were converted into forints (see Table 3).

In the second scenario (if the APR applicable to the current CHF loan portfolio is taken into account), costs do fall to a large degree, but are still high. By late June 2010, the interest rate differential between newly issued forint loans and existing Swiss franc loans had decreased to 1.7 percentage points for housing loans and 1.2 percentage points for home equity loans. As regards other loans and car purchase loans, which account for the majority of these loans, the interest rate differential is still high, generally over 4 percentage points.

Based on these findings, the cost of conversion would amount to 2.7 percent of GDP if the country's entire foreign currency debt portfolio were converted. Corresponding figures for mortgage loans and housing loans are 0.8 per

Table 3

Costs arising from interest rate differentials. Calculations were based on the APR on CHF loans effective at the time of borrowing and on the assumption that the entire foreign currency debt portfolio is converted

(30 June 2010)

	NPV of costs from interest rate difference	
	HUF Bn	as percentage of GDP
Households' total FX denominated loans	1,805	6.9%
from which mortgage loans	850	3.3%
from which housing loans	517	2.0%

Note: NPV (net present value): the present value of future costs.

Source: Authors' own estimates.

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[3] No data is available on the distribution of the portfolio by interest rates effective at the time of borrowing. We estimated the average interest rate effective at the time of borrowing based on the interest on the existing portfolio and on newly issued loans.

Table 4

Costs arising from interest rate differentials. Calculations were based on the APR on CHF loans when derived from the current yield curve and on the assumption that the entire foreign currency debt portfolio is converted

(30 June 2010)

	NPV of costs from interest rate difference	
	HUF Bn	as percentage of GDP
Households' total FX denominated loans	696	2.7%
from which mortgage loans	217	0.8%
from which housing loans	145	0.6%

Source: Authors' own estimates.

Table 5

Present value of the total costs incurred by the conversion of CHF debt into forints, provided that the entire foreign currency debt portfolio is converted

(30 June 2010)

	Redenomination with the current exchange rate and APRC		Redenomination with the exchange rate and APRC at granting	
	HUF Bn	as percentage of GDP	HUF Bn	as percentage of GDP
Households' total FX denominated loans	696	2.7%	3,159	12.1%
from which mortgage loans	217	0.8%	1,776	6.8%
from which housing loans	145	0.6%	1,023	3.9%

*Source: Authors' own estimates.*

cent and 0.6 percent, respectively (see Table 4). This estimation undershoots actual costs because the interest rate applicable to the conversion may be lower than the current interest rate pertaining to the existing portfolio (or the interest rates that can be derived from the yield curve).

Based on the above, we provided two alternative estimates for exchange rate and interest rate-related costs. An analysis of the total costs reveals that even the minimum costs of conversion can be significant (see Table 5). In the case of an interest rate lower than the current one, and with an exchange rate higher than the current one, total costs may rise considerably. At a macro-economic level it is not an additional burden, rather, it is a reallocation of costs to economic actors (households, banks and the government) according to who is going to bear the costs.

Finally, it might be worth noting that conversion also entails administrative costs and there are also administrative limitations. The amendment process of agreements pertaining to loans to be converted may take rather long, incurring further costs.

Converting all foreign currency household debt also entails a significant transfer of exchange rate risk between the different sectors of the economy, which might have a hefty price tag

The conversion of all foreign currency debt would not reduce household debt and, hence, the country's net external debt. The reason for this is that the volume of household debt would remain unchanged after the conversion, only the name of the currency would change. As conversion would not bring about any change for any sector or, based on the above, for households regarding indebtedness per se, ultimately, there would be no change in the country's indebtedness either. Given that net external debt equals the sum of the net exchange rate positions of economic sectors (see Chart 5), households' open positions would have to be taken over by another sector if conversion was to take place. Currently, households have open HUF positions because of their foreign currency debt; therefore, they would benefit from the appreciation of the forint's exchange rate in the form of lower monthly instalments. If the entire foreign

Chart 5

Open FX positions of main sectors as a percentage of GDP
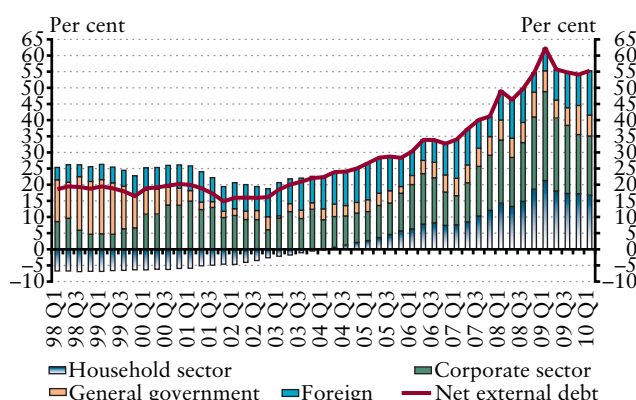
Source: MNB.

currency debt portfolio were converted, households' open HUF positions, currently amounting to 18 per cent of GDP, would cease to exist.

Why can't banks assume the exchange rate risk exposure of households?

Currently, banks' FX assets outweigh their foreign currency liabilities, as a result of which they have an open position that is closed outside the balance sheet (the termin leg of the currency swap is an on-balance sheet item, while its forward leg is an off-balance one). Thus, domestic banks finance foreign currency loans in two different ways: using HUF through swaps or by borrowing in foreign currency.

If household debt were converted under normal circumstances, that is, either the borrower or the bank initiates conversion in the financial markets, banks' open positions in their balance sheet would be closed, or, in the event of a larger-volume conversion, the situation would even 'reverse', as their foreign currency liabilities would now outweigh their foreign currency assets. Banks could close foreign currency swaps, now the opposite of the initial swaps, on international markets or with the corporate sector, the government or the central bank. Whenever economic participants assume the open FX positions of households outside their balance sheet, the on-balance sheet positions of banks are changed or reversed. Although a significant change may materialise in banks' on-balance sheet positions, due to high capital requirements, their total B/S position remains closed. In consequence, the banking sector cannot assume households' open positions, it can only function as an intermediary.

On the borrowers' side – with the intermediation of banks on the spot FX market – there is HUF demand when loans

are disbursed and HUF supply when they repay their loans. This means that, irrespective of the type of financing provided by banks, a fast, large-scale conversion of foreign currency loans would result in a considerable depreciation of the forint.

The assumption of positions by non-residents would lead to a weaker exchange rate and higher yields

Currently, non-residents' open exchange rate position amounts to 10 per cent of GDP. If, via the intermediation of the banking system, the entire position of households were assumed, the exchange rate risk exposure of the non-resident sector would be three to four times its current level. Non-residents could assume households' position in two different ways. With assumption on the balance sheet, non-residents would have their foreign currency assets converted into forints (spot deal) and, subsequently, purchase forint assets, i.e. government securities, shares and central bank bonds. Non-residents would only be willing to assume households' sizeable open position at a lower exchange rate and/or a higher interest rate.

The corporate sector is unlikely to assume households' position

Currently, the current net open FX position of the corporate sector amounts to 18 per cent of GDP. The corporate sector would be able to assume households' open position through further borrowing in foreign currencies from banks (on-balance sheet assumption), or concluding forward positions with banks or directly with households (outside of the balance sheet assumption). However, the corporates that intend to switch their FX position are likely to have taken out an foreign currency loan in the required amount or concluded the required number of derivative transactions. Another disincentive is that even if the corporate sector assumed households' net open FX position, it may not be able to manage it significantly better.

Although the government and the central bank would be able to assume households' positions without depreciating exchange rate, the resulting significant exchange rate exposure would increase the risks to the sustainability of public debt

The government and the central bank would be able to assume households' open FX position without a depreciation of the exchange rate. The government would be able to assume the position through changing the currency composition of government securities to be issued in the future. However, if the country's entire foreign currency debt portfolio were converted, the share of foreign currency debt

in public debt would jump from the current (already high) 43 per cent to 72 per cent. The central bank would be able to use its foreign currency reserves to neutralise the HUF sell transactions by banks at the time of the conversion. It is important to stress that the open position of the consolidated general government (including the central bank) would rise from the current 7 per cent of GDP to 31 per cent, irrespective of whether the position were assumed by the government or the central bank. Such exposure would mean that 10-per cent depreciation would raise the already high public debt – which amounts to close to 80 per cent of GDP – by 3.1 percentage points. Given the current global investor climate, where worries concerning the financeability of countries have increased markedly, this would only add to the country's vulnerability. Thus, the assumption of households' position by the government or the central bank is not a realistic alternative under the current circumstances.

Increasing moral hazard

The conversion of foreign currency debt is likely to increase the moral hazard associated with foreign currency lending, as it might encourage irresponsible debtor behaviour and adversely affect households with HUF loans. The availability

of a bailout programme for debtors with foreign currency loans could send the message to prospective borrowers that a consistently weak exchange rate triggers government intervention, which in turn might encourage them to take out foreign currency loans and undertake heavier indebtedness. This may reduce the borrowers' risk awareness and offer an unjustified advantage over those who deliberately refused to assume exchange rate risks despite higher HUF interest rates. Limiting conversion to delinquent borrowers would also carry significant risks because such may impair the willingness to repay significantly.

Presumably, it is not only because of a weaker exchange rate that debtors default on their loans. Therefore, an exclusive focus on debtors with foreign currency loans is expensive and also generates disincentives. Unemployment may also contribute to borrowers' insolvency. The causes of unemployment are mainly factors that are beyond borrowers' control. Therefore, easing the terms of repayment for debtors with foreign currency loans would discriminate against those having taken out forint loans. Thus, it is imperative that the causes of default and the most appropriate means of managing such causes be properly examined and identified in the case of defaulting debtors.

International experience

There are examples of the conversion of private sector debt from Asia and Latin America. Conversion was a failure in every country: voluntary conversion met with a low rate of participation and compulsory conversion incurred enormous costs.

In *Mexico*, where the majority of debt was denominated in USD, voluntary conversion programmes were introduced in the early 1980s. To this end, the government established a foreign exchange risk coverage trust fund (FICORCA) supervised by the central bank. FICORCA converted USD loans into peso loans (at an extended maturity of 8 years, with a 4-year grace period) at a fixed exchange rate guaranteed by the government, thereby assuming debtors' open foreign exchange rate position. The programme involved approximately 2,000 corporations, and, based on IMF calculations, its fiscal costs amounted to 2 per cent of GDP. Low costs were due to the fact that only few debtors volunteered. The peso appreciated against the dollar after 1993, which translated into a sizeable profit for FICORCA.[4]

A classic example of conversion is *Argentine's* 2002 asymmetric pesofication, which was harshly criticised by IMF.[5] The programme

included a deposit freeze, an end to convertibility and the introduction of a dual exchange rate regime. Bank balance sheets were dedollarised at the following rates: one Argentine dollar per USD on the asset side, and 1.4 Argentine dollars per USD on the liability side. The programme imposed significant losses on the economy, as it led to a loss of depositor confidence and a collapse in financial intermediation. Moreover, depositors took advantage of loopholes in the system to release frozen deposits, which made banks dependent on the central bank liquidity window. On the asset side, worrying about further disadvantageous government measures, creditworthy borrowers who could afford to do so decided to pay off their loans. The fiscal costs of the programme amounted to 15 per cent of GDP and the government measures set back lending seriously.

Widespread debt restructuring programmes allowing conversion were also introduced in *Chile* (1982) and *Indonesia* (1997). However, only few corporations availed themselves of the opportunity of conversion in both countries.[6]

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[4] Stone, Mark R.: Corporate debt restructuring in East-Asia: Some lessons from international experience. IMF paper on policy analysis and assessment. 1998.

[5] Laeven, Luc and Laryea, Thomas: Principles of household debt restructuring. IMF staff position note. 2009.

[6] Hagan, Sean–Kalter, Eliot–Weeks-Brown, Rhoda: Corporate Debt Restructuring in the Wake of Economic Crisis. In: Charles Collyns–G. Russell Kincaid (editor, 2003): Managing Financial Crises Recent Experience and Lessons for Latin America. IMF OP.

CONCLUSIONS

The conversion of foreign currency debt into forints does not reduce the debt of households and, hence, the net external debt of the country. Instead, it generates a transfer of costs and exchange rate risks between the different economic actors. Cost transfer arises because debtors will be willing to swap their foreign currency debt to forints only if instalments remain the same or are lowered. In addition to cost transfer, a transfer of foreign exchange rate risks also occurs, where households' open FX positions should be 'purchased' by another sector. Non-residents would only be willing to assume the entire position at a much weaker exchange rate and at much higher interest rates. Only the government or the central bank would be able to assume the entire position of households without the immediate weakening of the forint's exchange rate. Given Hungary's heavy foreign currency debt, however, this may increase its vulnerability, which could, vicariously though, still lead to a depreciation of the forint's exchange rate. Thus, conversion does not put an end to the vulnerability arising from the existing foreign currency debt. The assumption of the net open FX position by another sector does not reduce vulnerability and may even increase it.

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Gergely Fábián, András Hudecz and Gábor Szigel: Decline in corporate lending in Hungary and across the Central and East European region during the crisis

Escalation of the global financial crisis in autumn 2008 ended the economic boom financed by external funds and accompanied by dynamic expansion in credit in the Central and East European region. During the recession, corporate loan portfolios started to decline in nearly all countries in the region. The question arises as to what role banks played in this process: by restraining their credit supply, did they contribute to the deepening of the economic recession and to a slower-than-necessary recovery, or has the contraction in corporate lending resulted from shrinking corporate credit demand caused by the recession? The question is of particular relevance to Hungary, which recorded the steepest decline in corporate lending in the region. In this article, we look at 9 countries[1] in Central and Eastern Europe and the Baltic States to provide a comparative presentation of developments in corporate lending and interest rates across the region and explore the reasons behind the differences observed. Available information appears to support the assumption that in Hungary – as well as in the Baltic States – the tightening of credit supply may have contributed more to the decline in corporate lending than in other countries of the region. This can be attributed primarily to Hungary's reliance on external funds and vulnerability. At the same time, these results should be interpreted with the utmost caution for a variety of reasons. On the one hand, caution is called for because of the weakness of the analytical framework applied, as well as due to the limited reliability of the underlying data in certain cases. On the other hand, the CEE region is far from homogeneous: the economic structure and development path of individual countries reveal more differences than similarities, rendering the comparison of certain aspects of the developments rather difficult.

THEORETICAL INTRODUCTION: PECULIARITIES OF CREDIT MARKET ANALYSIS

Before turning to corporate lending developments in the CEE region, it is important to describe certain peculiarities of the credit markets, which make analysis of credit market processes and their effects on the real economy rather complicated. The main problem in the credit market is that prices cannot always fulfil their market clearing function, and thus supply and demand effects are extremely difficult to distinguish.

The role of prices and non-price credit conditions

According to the traditional competitive market approach, price plays a vital role in the functioning of the market as a whole. In a normal competitive market, the quantity demanded and the quantity supplied reach an equilibrium through price adjustment; therefore, price typically contains all relevant information based on which consumers and producers can make decision. This does not necessarily hold true to the credit market. The (effective) interest rate on a loan is typically considered as the price of a loan. However, while in the classical case buyers intend to buy exactly the same amount of products at a given market price as the suppliers wish to sell (and vice versa), this is not necessarily the case in the credit market. Indeed, in our analysis of "corporate loans" we are forced to look at a "corporate loan" as though it were a homogenous product. In point of fact, however, corporate loans are rather heterogeneous products; with a slight exaggeration one might say that no two loans are exactly the same, as no two companies are exactly the same either. Just like analysts, risk managers at banks also face the difficult task of distinguishing these products from one another, and they only succeed to a limited degree. Therefore, banks are not in a position to behave as "normal" sellers; they cannot extend a loan to anyone who is willing to pay the relevant interest rate, because that would be tantamount to offering two, potentially fundamentally different products at the same price. Vice-versa, this implies that, upon determining their

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[1] Bulgaria, Czech Republic, Estonia, Poland, Latvia, Lithuania, Hungary, Romania, Slovakia.

credit supply, banks take into consideration factors other than prices as well.[2] As a result, a future debtor must also comply with additional, *non-price* credit conditions as well (e.g. providing collateral for the loan; demonstrating a certain level of regular income or revenues, etc.). Banks impose non-price conditions in the course of the debtor classification process – known as 'rating' for corporate loans – conducted prior to granting a loan. They examine the information available on the firm as well as its finances; they assess the probability of its becoming insolvent and decide whether to provide credit and if so, under what conditions (in terms of collateral and other factors), and at what price. Consequently, analysis of these credit aggregates which are composed of heterogeneous products reveals that, while certain businesses or customers are willing to borrow at a specific (average) interest rate level, banks may still decide not to grant loans: hence, the observed interest rate is not necessarily identical to the market-clearing price. Thus, if banks wish to reduce their credit supply they have other means at their disposal, in addition to tightening interest rates; indeed, beyond a certain point raising their rates is not even in their interest. This is because investing firms must resort to riskier projects to raise the funds required to cover the increased borrowing costs, and consequently, higher interest rates would eventually increase the ratio of less creditworthy, riskier customers in the bank's portfolio. Therefore, banks will not raise their interest rates beyond a certain level, but rather start tightening their non-price credit conditions instead (this phenomenon is referred to as credit rationing in the literature; for further details see Stiglitz–Weiss, 1981).

As a consequence, changes in interest rates cannot be clearly attributed to a decline in supply or a decline in demand. While a classical negative supply shock – a steep decline in supply – will inevitably generate a price increase for the relevant product in a normal market, it can trigger any kind of shift in the interest rates of the credit market. Conceivably, 1) interest rates may increase while non-price credit conditions remain unchanged or tighten; or 2) interest rates remain unchanged and only the credit conditions tighten (banks restrain their credit supply by offering the loan at the same price but only to selected customers – the "flight to quality" phenomenon, see Bernanke et al., 1996); or, in more extreme cases, observed interest rates may in fact decline, while credit conditions are severely tightened (banks extend loans – rather cheaply – only to customers with the best credit rating). Whichever may be the case, access to loans, which is broadly determined by price and non-price conditions, will be more restricted than earlier. The consequence of this is that an analysis should consider both interest rate statistics and the credit conditions imposed by banks.

Credit supply

Banks may tighten non-price credit conditions for a variety of reasons. The lending surveys conducted by central banks usually cite two groups of reasons for tightening: lending ability and willingness to lend; in other words, how much banks can lend and how much they want to lend. As the majority of credit institutions in the Central and Eastern European region are in foreign ownership and often obtain funding through their parent banks, two additional factors are added to those described above; namely the parent banks' lending ability and their willingness to lend. According to the empirical evidence presented by De Haas-Van Lelyveld (2008), the allocation of resources to subsidiaries in international bank groups is also based on the specific country's status relative to the market of other subsidiary countries and the parent bank. For our purposes this implies that parent banks' willingness to lend is not only determined by the developments taking place in a specific country, but also by changes in its relative status to other markets.

A bank's lending ability can depend on three factors: the banks' capital position, access to market finance and liquidity constraints. These are generally interrelated: indeed, if a bank is unable to raise sufficient capital from the market to sustain its lending activity, there are reasonable grounds to assume that it also has limited access to market finance. However, the above constraints may also arise separately: a bank might be well capitalised – owing to the high profitability it has enjoyed in recent years, for instance – but may still face a shortage of funds, or certain liquidity tensions may impede its ability to lend even in case of sufficient capital adequacy and funding.[3]

A bank's willingness to lend is a more subjective element, which we believe reflects the bank's risk appetite, and may be basically associated with certain portfolio segments (indeed, if a bank reduces its lending to a certain clientele, ceteris paribus, it should register growth in other instruments). Thus, as it relates to corporate lending, willingness to lend implies that even if sufficient funds are available, a bank will make a decision as to which customers it prefers to finance: companies or other clients. Banks' willingness to lend combines profitability and risk

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[2] We may view this as an attempt on the banks' part to break down the aggregate credit market into more homogenous market segments aligned around non-price credit condiotions.

[3] For example, the foreign currency liquidity problems arising from the swap market freeze-up observed after October 2008 deteriorated Hungarian banks' ability to lend in foreign currency.

considerations: most of the time, higher profitability may not be achieved without higher exposure, and a worsening of either of these two factors, ceteris paribus, will translate into a decline in willingness to lend. In a recessionary environment the economic indicators of firms applying for bank loans deteriorate in general, which means that less firms will be granted a loan even if the loan approval conditions remain the same (this is also known as the corporate balance sheet channel of supply adjustment). If it is combined with a decline in banks' risk appetite, banks may even tighten their previous non-price conditions, whereby access to loans will be limited to clients whose creditworthiness is better than that of previous clients (this is also known as the bank lending channel). It is a generally accepted phenomenon that in times of economic recession banks, owing to their pro-cyclical behaviour, reduce their willingness to lend; however, it is very hard to define exactly what influences the extent of this reduction and when, as it largely depends on the – subjective – expectations and judgement of banks' policy-makers. According to the empirically verified "institutional memory" hypothesis set up by Berger–Udell (2003), experiences relating to losses sustained may influence banks' willingness to lend: the more vivid their memories of such losses are, the less inclined to extend loans banks' policy-makers tend to be.

Credit demand

The literature refers to interest rate levels and economic growth as the most important variables affecting demand (Bernanke–Blinder, 1987; Calzaa et al., 2003 and Lown–Morgan, 2004). In addition to macro-variables, developments in individual loan applications are analysed as well (depending on availability) (Jimenez et al., 2010; Puri et al., 2009), while others attempt to proxy demand by the credit demand perceived by senior loan officers based on the lending surveys of central banks (Calani et al., 2010; Ciccarelli et al., 2010). Certain firms do not even approach banks with their loan applications on the assumption that they would be rejected anyway, which poses a characteristic problem in the examination of individual loan applications. This phenomenon was observed far more often in the CEE region during the period preceding the crisis, even though a significant portion of those firms would have been creditworthy (Brown et al., 2010 and Popov–Udell, 2010).

Moreover, another difficulty hindering the analysis of credit demand and credit supply is the endogeneity between the credit market and the real economy. This means that it is not only macroeconomic changes that influence credit demand and credit supply, but in turn credit demand and credit supply also influence other macroeconomic variables. (In essence, this is known as the credit channel of monetary transmission, see Bernanke–Getler, 1995.) For example, firms may postpone their investment projects in view of the deteriorating income prospects and reduce their credit demand accordingly, which, in turn, may further decrease production. Therefore, when GDP is used as an explanation for credit market developments, we should keep in mind that credit market processes may also influence GDP.

DEVELOPMENTS IN BANKS' CORPORATE LOAN PORTFOLIO[4] IN THE CENTRAL AND EASTERN EUROPEAN REGION

In 2007 and 2008 – before the crisis – corporate lending increased by 24 percent on average in the Central and Eastern European countries under review, while certain countries saw a significantly higher credit expansion (Bulgaria and Romania recorded growth of 50 percent and 34 percent, respectively). These fast dynamics also reflected the real economic convergence of these countries, as the ratio of corporate indebtedness to GDP in converging countries falls well behind the Western European average. (In 2008, the outstanding amount of corporate loans as a percentage of GDP was 60 percent on average in the examined countries, while this ratio was 80 percent in Western Europe). Similarly to the dynamic credit growth observed before the crisis, the significant contraction in lending during the crisis was a relatively universal phenomenon across the region. The one or two months following October 2008 saw the beginning of a steady – and in many cases still ongoing – decline in lending to the corporate sector (see Chart 1). In a regional comparison, Hungary, the Baltic States and the Czech Republic experienced a far more severe downturn than Poland or Slovakia, where the decline was somewhat more moderate. In contrast, Bulgaria and Romania appear to be exceptions. According to the official statistics, lending to the corporate sector in Bulgaria has increased slightly since October 2008, while Romania reached a turning point and the loan portfolio started to expand in June 2009.

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[4] In addition to bank loans, firms may finance their operations through bond issuance, financial corporations (leasing companies, factoring companies, etc.) or through foreign loans (via parent companies or non-resident banks). Our analysis focuses on domestic bank loans as we believe that of the data available, these are the most reliable indicators of developments in the financing of resident non-financial corporations. The weight of the corporate bond market and the lending provided by financial corporations are negligible in the region. Regarding foreign loans, information would be needed in respect of the net external debt position, as in many cases foreign loans do not imply an actual financing within the country; instead, those funds are passed on through the regional centres operating in the specific country, thus, rather than financing domestic economic activities, they merely expand the financial account of a country on both the assets and liabilities sides. Due to data shortcomings we are unable to generate these data series for most countries under review.

Chart 1

Changes in the outstanding amount of corporate loans (October 2008=100) in the CEE region
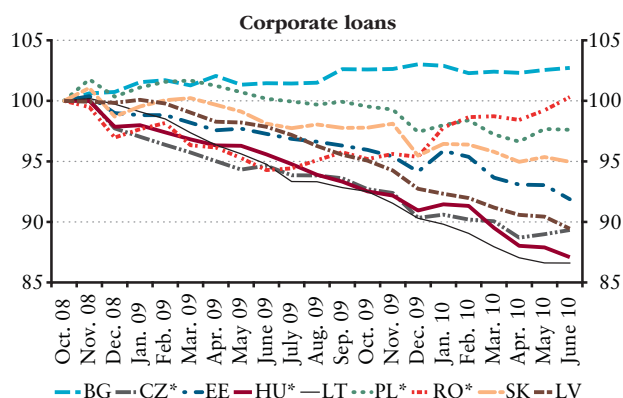
Source: National central banks.

Note: In the case of countries marked with * we adjusted for exchange rate effects; in the rest of the cases this was unnecessary due to the exchange rate regime or the use of euro. BG (Bulgaria), CZ (Czech Republic), EE (Estonia), HU (Hungary), PL (Poland), RO (Romania), SK (Slovakia), LV (Latvia), LT (Lithuania).

In terms of maturity structure, developments point to a greater decline in short-term loans in most countries – including Hungary – which also reflects the fact that due to the shorter maturity both the banking sector and the corporate sector were able to adjust more easily in these countries. Nevertheless, a significant decline was observed for even longer-term loans – mostly investment loans – in the Baltic States and Hungary, a development not typical elsewhere in the region. As regards the denomination of loans, the outstanding amount of loans extended in domestic currency declined steeply in the Baltic States (where foreign currency lending was predominant), while a substantial contraction was seen in Romania and Hungary as well. In the rest of the countries, the ratio of foreign currency denominated products remained largely unchanged within the total corporate loan portfolio.

At the same time, as we pointed out in the Introduction, these figures should be treated with great caution, as the indicators of certain countries might be significantly distorted by unique phenomena and statistical issues:

• In the Czech Republic, for instance, according to the Stability Report published by the central bank,[5] to a certain degree, firms substituted bank loans with foreign loans (through parent banks) and to a lesser extent, by bond issuance; thus, the deterioration in the financing position of the corporate sector was less

severe than the contraction in corporate lending of banks would suggest.

• Turning to Romania, before December 2009, part of FX loans to Romanian firms was extended directly by parent banks primarily for regulatory reasons – i.e. the high reserve requirements on foreign currency deposits. This regulation was relaxed in 2009, which may have contributed to the expansion of the loan portfolio from January 2010 through the retransfer of Romanian corporate loan portfolios by parent banks.

• Bulgaria has also experienced regulation-related distortions: during the boom period regulation limited the growth of banks' balance sheet total. Several credit institutions responded by outsourcing their loans to special purpose vehicles. During the crisis banks reallocated a substantial amount of loans in their balance sheets, which increased the outstanding amount of loans in the statistics even though lending to private sector did not improve in reality. However, information is not available regarding the volume of the reallocated loans and the distribution between the household and corporate segment.

Although such information is not available in respect of other countries, we cannot rule out the existence of similar unique factors.

WHAT CONCLUSIONS CAN BE DRAWN FROM THE DEVELOPMENTS IN INTEREST RATES IN THE REGION?

The onset of the crisis led to an increase in the interest rate spread[6] on corporate loans in every country, but to differing degrees (see Chart 2). In respect of loans denominated in local currency, Romania recorded the highest interest rate spread as well as the steepest crisis-related increase, while in the Czech Republic, Slovakia and Poland the increase of interest rate spreads was more moderate and started from lower levels. As for Hungary, in the pre-crisis period interest rate spread moved more or less in tandem with those recorded in the Visegrad countries; however, as a result of a sharp increase triggered by the crisis the Hungarian interest rate spread diverged from the others. Although the difference in the spread has somewhat decreased since the end of 2009, the level of the Hungarian premium still markedly stands out among the premia observed in other Visegrad countries. Interest rate spreads for euro-denominated loans also increased in every country in the wake of the crisis; however, the Hungarian interest rate spread was one of the lowest in the region both before the crisis and since.

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[5] http://www.cnb.cz/en/financial_stability/fs_reports/fsr_2009-2010/index.html.
[6] Defined as the difference between the annualised average interest rate on recently disbursed loans and the relevant three-month interbank benchmark rate.

Chart 2

Interest rate spread on new loan volumes denominated in euro and local currency in the CEE region
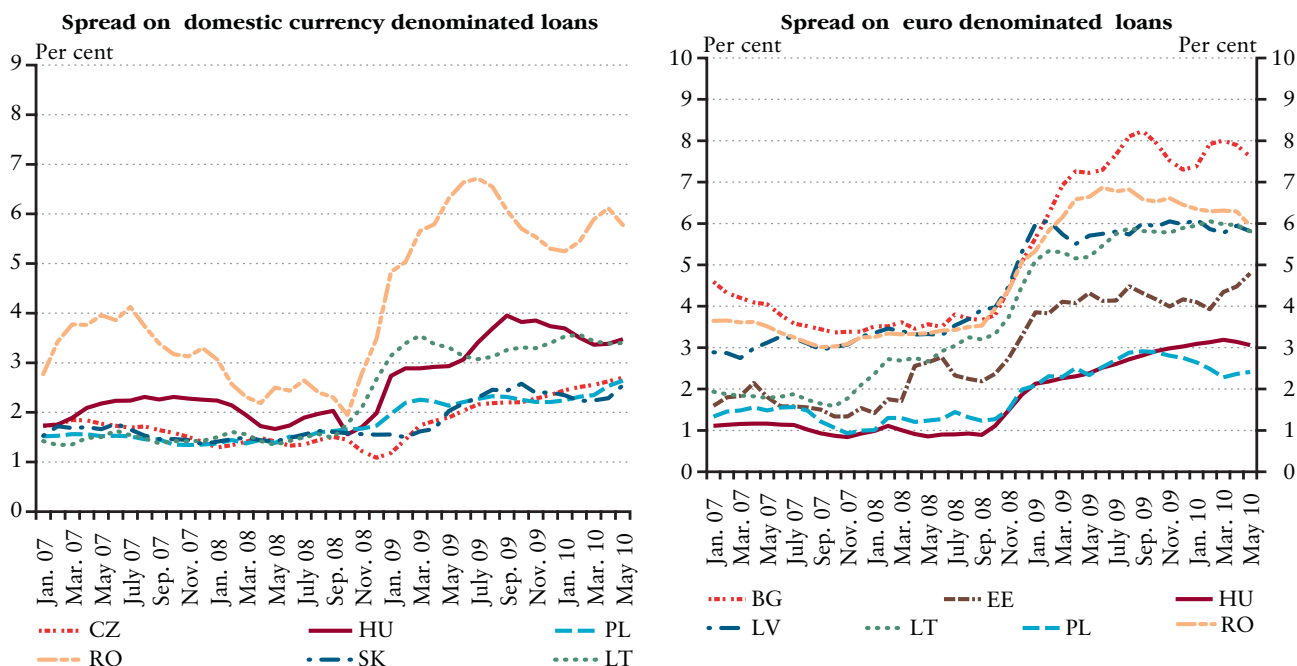
Source: National central banks.

Note: Interest rates smoothed by three-month moving averages.

Chart 3

Relation between the interest rate spread change and corporate lending contraction by denomination during the crisis
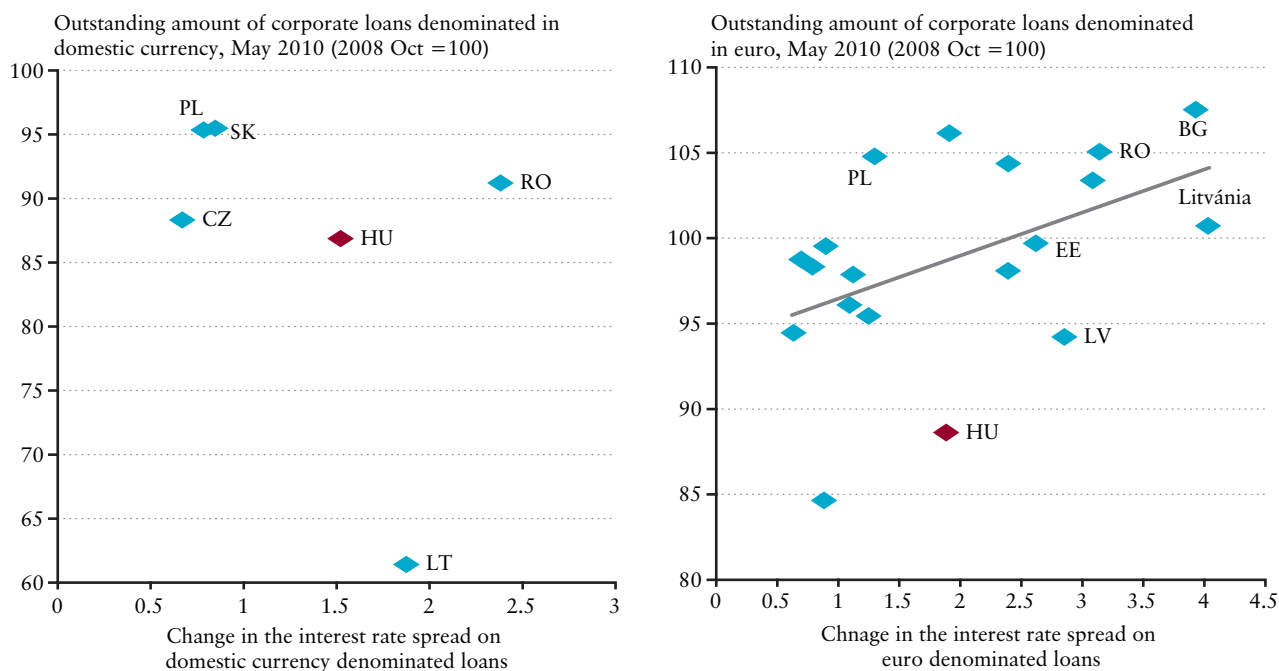
Source: ECB, national central banks.

Note: Exchange rate adjusted data. The change in the interest rate spread is the spread on the average interbank benchmark rate in 2010 and the spread on the average benchmark rate during the year preceding the crisis. For euro-denominated loans the right hand chart also indicates euro area countries.

Interest rate developments highlight the special behaviour of credit market prices described in Chapter 1. Examining the relationship between the foreign currency-denominated loan portfolio and interest rates, we find that the smaller the change in the interest rate premia on euro-denominated loans, the sharper the decline in the corporate FX loan portfolio (see Chart 3). While in a normal market this would translate into a decline in demand (surpassing that of supply), several signs suggest that this specific case reflects the dominant role of supply instead; thus, the moderation in prices was merely due to the special characteristics of credit markets. Indeed, lending surveys indicate that banks increased the premia on riskier loans to a larger extent than average premia. Accordingly, if credit conditions are only slightly tightened, the decline in the loan portfolio will be more moderate, leading to a higher increase in average risk premia. This might have been the case in Bulgaria and Romania, where the loan portfolio evidently remained unchanged or even grew with high and rising interest rate spread (although the previously mentioned statistical problems may distort the picture). By contrast, with more stringent credit conditions only clients with excellent credit rating have access to loans, while a great majority of riskier clients will be refused, which will keep the interest rate at a low level; however, lending may significantly contract even in an improving macroeconomic environment. Hungary is in a similar situation: the price at which euro loans are offered is one of the cheapest in the region, yet the contraction in corporate lending is by far the largest. However, Poland is considered an exception, where the interest rate spread remained at low levels and the outstanding amount of corporate loans did not decrease drastically, either.

Looking at domestic currency loans, it is hard to find any correlations; however, Lithuania is worth mentioning. In this Baltic state corporate lending decreased to the same extent as in Hungary, but this steep decline only affected loans denominated in the domestic currency (litas). According to the Stability Report of the Lithuanian central bank, this was a consequence of a considerable surge in the interest rates of litas-denominated loans in early 2009, subsequently banks priced out litas-denominated loans from the market. According to the lending survey presented below, in addition to interest rate conditions, banks significantly tightened their non-price conditions as well. The drastically subdued bank supply, which practically eliminated all litas-denominated lending, reflected fears regarding a potential fall in Lithuania's exchange rate

regime, which pegs the litas to the euro. From the perspective of banks, this would have inflated litas-denominated loans.[7]
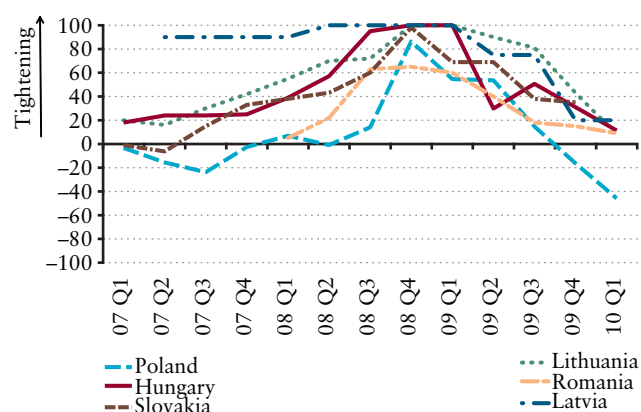
NON-PRICE CREDIT CONDITIONS

Turning to the non-price credit conditions, in the five countries of the CEE region where lending surveys[8] are conducted, indicators of corporate credit conditions exhibit rather similar developments: starting from around 2007, an increasingly severe tightening cycle was observed in all of the countries, which continued, albeit with a slight moderation, even after its peak at the end of 2008 (see Chart 4). Of the five countries presented, banks broadly indicated tightening in Lithuania, Latvia and Hungary, which appears to be consistent with the extent of the decline in corporate lending.

By contrast, in Romania and Poland – which are among the countries reporting the slightest decline – the ratio of banks reporting tightening was significantly smaller. As mentioned earlier from the evolution of prices could not be determined unambiguously whether the low interest rate level and the strong decline can be attributed to a negative demand shock or a supply shock. However, in the case of Lithuania, Latvia and Hungary, the lending survey confirms that, with low interest rate levels, non-price credit conditions played a predominant role, and suggests that changes in banks' credit supply had a strong impact on corporate lending.

Chart 4

Changes in corporate credit conditions
(net percentage of banks reporting tightening/easing)

Source: National central banks.

Note: The chart does not indicate the magnitude of tightening/easing, only the direction. The chart indicates changes relative to the previous quarter; the level of credit conditions is unknown.

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[7] There was no such threat in the case of foreign currency loans: thanks to the fixed exchange rate regime, Lithuanian regulations – in contrast to those in Hungary – do not require banks to hedge their euro positions.

[8] In lending surveys, rather than providing a general assessment of the market, loan officers reply to questions on the developments in demand/credit conditions from the perspective of their own banks. It should be noted that conclusions cannot be drawn from the data of the lending survey with respect to the level of demand/credit conditions or the extent of the change, as that information merely reflects qualitative changes. Accordingly, cross-sectional comparison among individual countries should be interpreted with reservations.

Table 1

Change in perceived demand – net percentage balance of banks reporting increase and decrease

Countries		2007–2008 Q2	2008 H2	2009	2010 H1
Poland		Increase	Increase	Unchanged	Increase
Lithuania		Increase	Decrease	Decrease	Decrease
Romania		-	Increase	Decrease	Decrease
Slovakia		Increase	Decrease	Decrease	-
Latvia		Unchanged	Decrease	Decrease	-
Hungary	Total	Unchanged	Increase	Increase	Increase
	Investment loans	-	Decrease	Decrease	Increase

Source: National central banks.

Note: the table does not indicate the magnitude of tightening/easing, only the direction. It indicates changes relative to the previous quarter; the level of demand is unknown.

DEMAND-SIDE FACTORS BASED ON THE LENDING SURVEY

As regards the demand side, the lending surveys show a much less homogenous picture as in the case of credit supply. Respondents in Poland did not perceive a material decline in demand; in fact, some banks experienced growth (see Table 1), which is consistent with the developments in corporate lending and macroeconomic performance. Corporate credit demand subsided in the rest of the countries. By contrast, in Hungary the demand for loans – primarily for working capital loans – steadily increased from quarter to quarter during the crisis, while demand for long-term loans declined. This suggests that demand did not play a predominant role in the development of lending, in view of the fact that the portfolio of working capital loans decreased significantly as well. This phenomenon may be attributed to the fact that, owing to the poor economic performance, the pre-crisis period saw a stagnating demand in Hungary, while demand steadily increased during the same period in other countries in the region thanks to good economic performance. We may conclude that in other countries of the region banks perceived a decline from a higher demand level. Furthermore, due to the peculiarities of the lending survey, paradoxically, supply constraints may also account for the growth in demand in Hungary. Indeed, if supply constraints exist or strengthen, firms are forced to turn to more banks in an attempt to secure a loan, which banks perceive as an increase in demand.

DEVELOPMENTS IN MACROECONOMIC FACTORS IN THE REGION

The recession hitting developed countries spread rapidly to the predominantly small, open economies of Central and Eastern Europe. Firms postponed their investment projects or cut back their production activity, which inevitably reduced demand for loans. The only exception was Poland;

Chart 5

Relation between GDP growth rate and corporate lending contraction (exchange rate adjusted) during the crisis in the CEE region
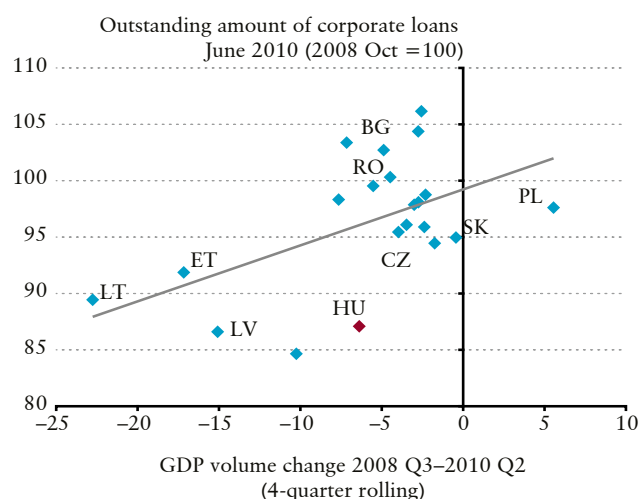
Source: Eurostat, ECB, national central banks.

Note: For the Czech Republic, the chart indicates an estimate, taking into account the substitution effect between external loans and bank loans.

the only economy in the region, in fact in the EU, to register growth in GDP even in 2009. This can be primarily attributed to the fact that Poland is a less open economy with sufficiently large domestic market. A loose connection can be discerned at the macro level between the fall in GDP and the contraction in corporate lending (see Chart 5), and a similar co-movement can be observed with the changes in industrial production and export dynamics. In accordance with the relation, the Baltic States – which were hit particularly hard by the recession – were among the countries which experienced the largest contraction in lending, while Poland is among those with a more moderate decline in lending. Remarkably, developments in lending and economic growth are much more diverse in new Member States than in the euro area, where credit demand

captured through the economic growth apparently played a negligible role in the development of lending.

However, in some countries macroeconomic fundamentals do not explain adequately the extent of the decline in corporate lending. For example, in Hungary – despite the average severity of the recession – lending to the corporate sector declined to a similar extent as in the Baltic States; in fact, Hungary recorded a substantial fall in the outstanding amount even in the first half of 2010, at a time when macroeconomic conditions had already started to improve.[9] By contrast, we do not see a similarly pronounced drop in lending either in Romania or in Bulgaria – despite the fact that they faced a similarly deep recession as Hungary – although this may partly reflect the statistical issues indicated above.[10]

In summary, based on the demand indicators it appears that credit demand may have contributed significantly to the decline in corporate lending in most of the regional countries as well (while in Lithuania the domestic currency loans suffered a negative supply shock, waning demand may have played an equally significant role in the contraction in total corporate lending). By contrast, changes in credit demand appear to be less relevant in the contraction in Hungary, which suggests that supply constraints were more dominant here in regional comparison.

POSSIBLE REASONS FOR SUPPLY CONSTRAINTS

The fact that a large part of the banking sector is controlled by non-resident parent banks and that banks turn to their parent banks for capital and, in most cases, external funds, renders an analysis of regional banks' credit supply rather difficult. Consequently, subsidiaries' lending ability (which can be captured relatively well by different indicators) and their (more subjective) willingness to lend also depend on the parent banks' risk appetite and lending ability. While subsidiary and parent bank elements can be separated reasonably well in the case of lending ability (on the basis of financial indicators), group control renders this practically impossible in the case of willingness to lend, and – owing to the group level allocation of capital and resources – it is extremely difficult to separate the subsidiary's lending

ability from the parent banks' willingness to lend. The latter problem is clearly illustrated by the connection between the capital adequacy of the banking systems and the decline in corporate lending. Although data suggest that banks' capital adequacy (see Table 2) was higher in the countries (for example, Romania and Bulgaria) where balance sheet statistics indicate a lesser decline – or none at all – in corporate lending, the causality is not entirely clear. Conceivably, a better capital position may have contributed to banks' less restrained credit supply in these countries, or parent banks may have allocated more capital to them with the intention of increasing their lending there (or they attempted to prepare for an increase in corporate loan portfolios in view of the regulatory reasons referred to above).

Considering subsidiaries' lending ability, it appears that the decline in corporate lending was less pronounced in banking systems with a lower loan-to-deposit ratio (see Chart 6), while in Hungary and the Baltic States – where a modest deposit portfolio combined with significant credit growth drove the loan-to-deposit ratio well above 100 percent[11] – there was higher pressure for adjustment on the asset side. Additionally, the importance of internal funding increased during the crisis due to the decrease – with the exception of Poland and Hungary – in external funding (see Table 4).[12] In the Baltic States the decrease in external funding was consistent with the decline in the outstanding amount of loans to the domestic private sector. In Bulgaria and Romania, however, the decline in external funds did not hit banks very hard, because the outflows were partly offset by the increase in the stock of domestic deposits.

At first sight, the situation of Hungary in this respect looks paradoxical: despite the fact that the banking sector did not experience a decrease in external funding, the decline in the corporate lending was far more substantial in Hungary than in other regional countries. However, this had a technical reason: amid swap market turbulences, domestic banks reduced their swap portfolios vis-à-vis non-residents during the crisis, thus – despite the abundant forint liquidity of Hungarian banks – non-resident parent banks were unable to reduce their foreign currency funds in their subsidiaries, because this would have led to a widening of domestic banks' foreign currency position in

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[9] The substitution between bank lending and other funding sources cannot be observed in Hungary: the external funding of regionally active firms were subsequently transferred to another country, which increased the total corporate outstanding amount both on the liabilities and on the assets side.

[10] As it relates to the parent bank's side of lending ability: the financial indicators of parent banks do not reveal any significant differences between individual countries (see Table 2). The Tier 1 rates of parent banks varied between 10 percent and 10.5 percent in most countries, with the exception of Latvia and Lithuania, which recorded a rate under 10 percent in 2009.

[11] In addition, the share of foreign currency loans is higher in these countries, increasing their vulnerability.

[12] The impact of this was less substantial in the Czech Republic and Slovakia, where external funds play a negligible role in the financing of banks, which is clearly illustrated by the fact that the loan-to-deposit ratio is below 100 percent in both countries.

Chart 6

Relation between the loan-to-deposit ratio/net external debt and corporate lending contraction during the crisis (exchange rate adjusted) in the CEE region
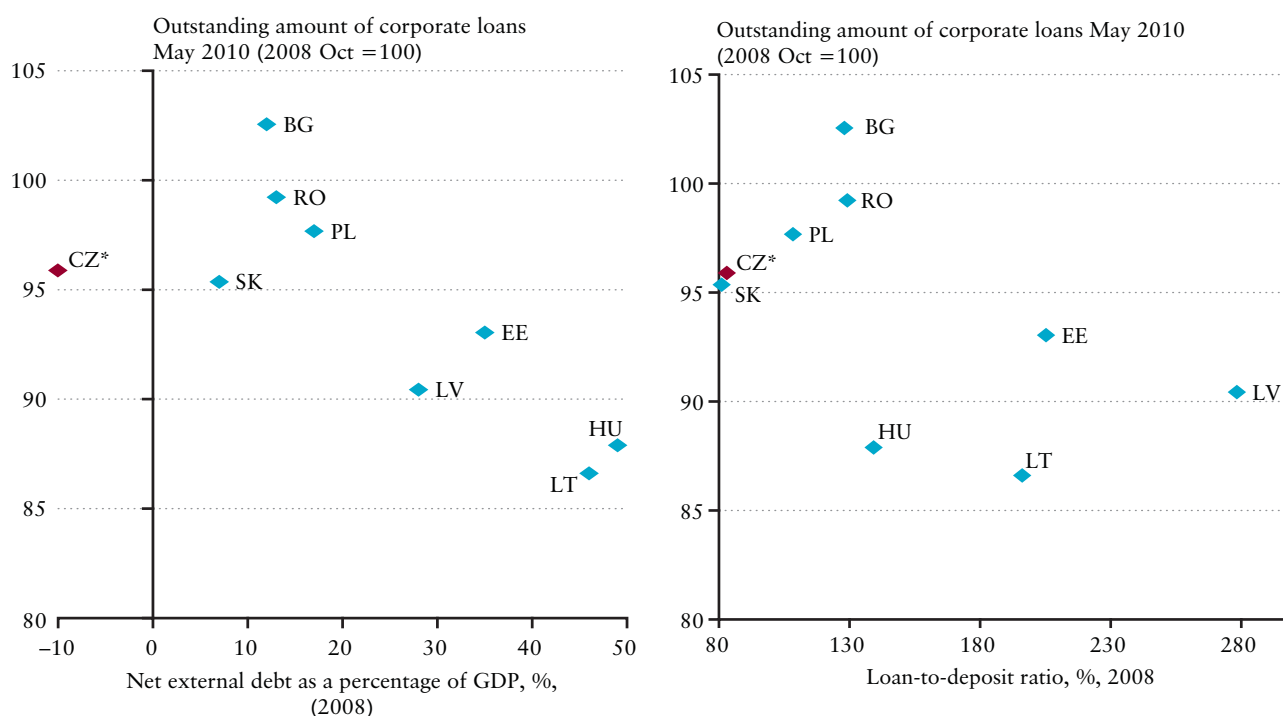
Source: National central banks, IFS, Eurostat.

Note: For the Czech Republic, the chart indicates an estimate, taking into account the substitution effect between foreign loans/bond issuance and bank loans.

their balance sheets.[13] Accordingly – unlike in other countries of the region – in the balance sheet of the Hungarian banking sector the decline in private sector lending was primarily offset by an increase in central bank bonds on the asset side (resulting in abundant forint liquidity), rather than a decrease on the liabilities side (in particular, in external funds).

Turning to banks' willingness to lend, group-based control makes it unnecessary to examine parent banks' and subsidiaries' willingness separately. Following the collapse of Lehman Brothers, willingness to lend was primarily determined by risk aversion. Although the credit losses suffered by Lithuania and Latvia – which were rather severe even in regional comparison – may have contributed to the substantial downturn observed in corporate lending, interestingly enough we cannot discern a connection between lending and portfolio quality or the rate of

portfolio deterioration in the other countries under review (see Table 2). Therefore we may infer that there is not a strong correlation between banks' risk appetite and the actual losses they sustained. Apparently, foreign investors' and owners' risk perception was determined by general (subjective) concerns about the vulnerability of the specific economy and its reliance on external funds, factors which are best captured by the net external debt of a country (see Chart 6). At the same time, this also implies that the severe public indebtedness may have significantly deteriorated the risk perception of Hungarian banks and the economy.

CONCLUSIONS

As pointed out in the reports published by regional central banks, demand and – as a result of a more stringent lending policy – supply both contributed to the deceleration observed in the credit growth rate. Beyond this, it is hard to identify

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[13] Unlike their peers operating in a fixed exchange rate regime, Hungarian banks resorted primarily to the swap market to hedge the open foreign currency positions stemming from foreign currency lending. Consequently, the external *foreign currency* requirement of the Hungarian banking sector was much higher during the pre-crisis period than indicated by the on-balance sheet statistics (swaps are off-balance sheet items). In the wake of the crisis, however, the forint requirement of non-residents abated, and it was more difficult for Hungarian banks to find foreign partners willing to swap foreign currency against the forint. For this reason, domestic credit institutions reduced their swap portfolios. Accounting for this decrease, similarly to other countries in the region, Hungarian banks' external funding decreased as well.

and quantify the role of demand and supply. Relying on aggregate statistics and a simple analysis framework, in our analysis we have attempted to determine which countries of the region may have had stronger credit supply constraints in addition to waning demand. Based on the factors affecting supply and demand and the findings of the lending surveys we may conclude that banks' credit supply constraints may have contributed more in countries where the corporate lending declined dramatically. Banks' supply behaviour appears to reflect a country's vulnerability and reliance on external funds, factors which had a negative impact both on risk appetite due to high net external indebtedness and on lending ability due to high loan-to-deposit ratios. Accordingly, the higher a country's net external indebtedness was, the less inclined non-resident investors and owners were to provide additional funds to the country's banks – and hence, companies. This holds especially true to Hungary, where the decline in lending was far more significant than would be explained – based on regional comparison – by the recession of the real economy, or would be consistent with the corporate credit demand indicated by the lending surveys. Thus, the shrinking credit supply may have contributed more significantly to the decline in corporate lending in Hungary. Consequently, low interest rate premia and a pronounced contraction in lending suggest that supply constraints prevent riskier clients from obtaining loans, and limit the access to loans only to corporate clients with a high credit rating. However, the applied analytical framework is not suitable for determining exact measures (or impacts); moreover, in view of the comparability problems of regional data and statistical distortions, our findings should be interpreted with due caution.

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ANNEX

Table 2

Banking system indicators at the end of 2009

	Loan-to-deposit ratio	ROA	Tier 1 ratio	Tier 1 ratio (parent banks)	NPL	Change in NPL 2008–May 2010
Bulgaria	126	1.1	17.5	10.6	8.2	9.0
Czech Republic	75	1.4	17.2	10.3	5.7	2.8
Hungary	143	1.7	11.9	10.4	7.4	4.4
Estonia	190	−3.4	9.4	10.4	4.1	2.8
Latvia	255	−4.0	10.8	8.6	19.6	15.2
Lithuania	169	−3.9	8.0	9.4	4.6	14.7
Poland	105	0.8	12.1	10.0	8.0	4.7
Romania	118	0.5	12.9	10.0	11.6	9.2
Slovakia	87	0.5	11.6	10.4	5.4	4.0
Euro area	107	0.2	10.1	–	4.2	2.0

Source: ECB, autonomous research, Bankscope.

Note: NPL indicates below average, doubtful or bad loans (loans expected to generate losses). Exceptions: For Slovakia it contains loans with a delinquency of over 90 days. For Bulgaria it contains restructured loans and loans which generated losses.

Table 3

Credit aggregates at the end of 2009

	Corporate loans by banks (as a percentage of GDP)	Corporate loans total (as a percentage of GDP)	FX denominated corporate loans/total corp. loans	FX denominated loans/total loans	Average credit growth (2007–2008)
Bulgaria	46	120	75.3	58.1	49.6
Czech Republic	21	41	18.1	8.2	15.2
Hungary	27	67	57.7	64.5	14.9
Estonia	52	47	91.5	86.9	15.9
Latvia	50	75	94.4	92.2	23.2
Lithuania	35	46	74.9	73.4	24.0
Poland	15	36	23.7	32.8	25.3
Romania	20	48	59.5	60.3	33.7
Slovakia	22	28	2.4	1.1	17.1
Euro area	52	74	n.a.	n.a.	10.0

Source: ECB, Eurostat, national central banks.

Table 4

Liabilities side of banking systems in the CEE region

	External liabilities/Total liabilities (2008)	External liabilities/Total liabilities (June 2010)	Change in external liabilities (as a percentage of total liabilities)	Private sector deposits/Total liabilities (2008)	Private sector deposits/Total liabilities (June 2010)	Change in private sector deposits (as a percentage of total liabilities)
Bulgaria	26.2	19.8	−6.4	52.9	55.7	2.8
Czech Republic	9.8	8.1	−1.7	55.9	58.8	2.9
Hungary	25.4	26.1	0.7	35.8	35.2	−0.6
Estonia	43.4	40.5	−3.0	34.4	38.6	4.2
Latvia	58.6	49.3	−9.3	23.8	26.5	2.7
Lithuania	45.8	36.3	−9.5	38.3	42.5	4.2
Poland	14.9	15.6	0.7	52.9	54.5	1.6
Romania	29.7	26.3	−3.4	44.2	46.6	2.4
Slovakia	4.6	3.9	−0.7	52.4	61.9	9.5
Euro area	15.0	13.7	−1.3	29.3	31.6	2.3

Source: ECB, national central banks.

Áron Gereben and István Mák: Potentials and limitations of non-governmental forint-denominated bond issues by non-residents

This article deals with forint bonds issued by non-residents. We present the role of such bonds in financing the external debt in the domestic currency, as well as the typical cash flows associated with their issue and the related interest rate swaps. By buying so-called euroforint bonds issued by highly rated, generally supranational organisations foreign investors take the exchange rate risk of the external debt, while the domestic banking system obtains long-term forint financing at a fixed interest rate. Over the past 10–15 years, the Eurobond market has largely contributed to the ability of New Zealand and South Africa to finance their balance of payments deficit, while eliminating the need to burden domestic actors with the inherent exchange rate risk. However, in the case of the forint the market of this instrument has remained relatively immature.

In the second part of the article, we examine how and why South Africa and New Zealand have been able to successfully tap the Eurobond market, and what conditions should precede such an upswing in euroforint issues. We conclude that the euroforint bond market has remained immature primarily due to the inability of Hungarian banks, characterised by constrained foreign exchange liquidity, to satisfy the foreign currency financing needs of bond issuers through interest swaps, and consequently, they are also unable to draw on their fixed interest forint funds. This can be attributed to the fact that in previous years Hungarian banks financed a part of their FX loans by local currency deposits, and – seeking to hedge their exchange rate exposure – they buy foreign currencies and offer forint on the FX swap market. While euroforint bonds could be considered as an attractive target for a specific group of investors, their interest rates are not competitive compared to the yields attainable by speculation on the foreign exchange market.

INTRODUCTION

Over the past years, foreign currency lending has expanded strongly in Hungary, and has led, amongst other things, to the accumulation of a sizeable net external debt by domestic economic agents – and in particular households – in the form of substantial open forint-foreign exchange positions. This foreign exchange position has contributed significantly to the financial vulnerability of the country over the past two years, and has also imposed constraints on economic policy. Although the weakening of the forint should drive up net exports, the depreciation of the nominal exchange rate increases the debt burden of companies and households, which are indebted in foreign currency and have no foreign exchange income; this in turn leads to a decline in capital investments and consumption, and thus may ultimately have a contractionary impact (Krekó and Endrész, 2010).

Analysing countries with a similar level of external debt, we found that the permanent and sizeable external financing need arising on the part of the domestic sectors (household and non-financial corporate sector) is not always accompanied by an increase in their exposure to foreign exchange rates. This situation occurs when the funds raised by domestic banks abroad are denominated not in a foreign currency, but rather in their own domestic currency, and thus exchange rate risks are assumed by foreign investors. This is only possible with the existence of an instrument, denominated in the domestic currency, which – on the basis the related risk and return – can be taken into consideration by a wide circle of investors, including non-residents in the process of portfolio building. Typically, such instruments include Hungarian local currency government securities denominated in forint, central bank bills and FX swaps. Foreign investors with lower risk appetite may deem forint bonds issued by a foreign non-governmental organisation, called *euroforint bonds*,[1] a more attractive financial instrument.

In the following sections, we first give an overview of the role of the Eurobond markets in financing the economy, and of

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[1] The name originates from the New Zealand dollar bonds enjoying great popularity with investors since the mid-1990s. These bonds are called eurokiwi bonds, referring to the dollar denominated bonds issued by non-residents (eurodollar bonds) on the one hand, and the popular name of the New Zealand dollar (kiwi) on the foreign exchange market. A Kauri bond is a New Zealand dollar-denominated bond issued in New Zealand by non-residents. These bonds are in favour with investors as they are accepted as security for the repo transactions of the Reserve Bank of New Zealand. However, this latter instrument falls outside the scope of this article.

the market of bonds issued by non-residents for non-residents in that specific currency. We present the motives of issuers and investors, and examine how attractive targets these bonds can be for those pursuing a *carry trade* strategy[2] compared with other financial instruments. Based on previous years' volume and price figures, we try to identify the reasons leading to the long-standing popularity of certain currencies and to the marginal role of others on this market.

MACROECONOMIC ROLE OF THE EUROBOND MARKET

The vast majority of small, open economies, including Hungary, struggling with a high balance of payments deficit and consequently with high levels of external debt, have no or only limited capacity to borrow abroad in their own currency. Although in most cases the state is able to secure the inflow of funds in its own currency (that is, in forint) to a certain extent – 20-25 percent of Hungarian government securities denominated in forint are held by foreign investors – in these countries, the substantial majority of the external debt owed by the private sector is denominated in a global currency (dollar, euro, yen). This also means that in these countries, indebted economic agents run a considerable exchange rate risk: the depreciation of their own currency increases the amount of their debt calculated in their own currency which carries a high economic policy risk.

The phenomenon that small, open, emerging economies are generally unable to finance their external debt in their domestic currency is dubbed the "original sin" in the economic literature (Eichengreen–Hausman, 1999). Even if foreign investors are willing to buy assets denominated in the domestic currency of the given country (e.g. in Hungary's case, forint) generally, the government is the single domestic actor with an appropriate credit risk rating and ability to offer a sufficiently large volume of securities on the market viewed by foreign investors as attractive, low risk and liquid. The agents of the private sector, including the banking systems, are too risky, individual issuers have relatively low funding need, and are not known enough to be classified by the foreign investors as creditworthy in their own currency, therefore they can usually only draw on foreign capital in a foreign currency.

The existence of Eurobond markets allows a group of investors who would otherwise not be willing to assume such a risk to take on the exchange rate risk of the external debt from the economic agents of a given country. On this

market, well-capitalised issuers with high, often AAA ratings – international (supranational) financial institutions (World Bank, European Investment Bank, European Bank for Reconstruction and Development), national development institutions, global banks – issue bonds denominated in the currency of small, open economies. The reputation and excellent credit rating of the issuers make these securities appealing to final investors who would not otherwise buy bonds registered by the issuers of the given country and denominated in their domestic currency. The funds raised by the high-graded issuer and denominated in the currency of the given country reach the financial intermediary system operating in that country – through the financial transactions detailed in the following sub-sections – and thus, ultimately the exchange rate risk arising when the small, open country borrows funds abroad is taken by a foreign agent, the bondholder. In effect, assuming that balance of payments deficit is a given, the significance of the Eurobond markets in terms of the macroeconomy lies in allowing the given country to finance its external deficit in its own currency instead of a foreign one. Ultimately, the Eurobond market serves as a potential way to escape "original sin".

The deepening integration of the financial markets since the mid 1990s facilitated the issue of bonds denominated in the currencies of emerging countries by the abovementioned institutions. Nevertheless, in the case of most emerging countries the aggregate value of the portfolio of Eurobonds issued in their domestic currency is marginal compared to the net external debt of the country in question. However, in some countries – for example, New Zealand, Australia and South Africa – Eurobond-type issues have reached a level where the foreign agents can make a considerable contribution to financing the net external debt. Concurrently, domestic companies and households take out credit in their own currency, bearing interest lower than would have been without issuing Eurobonds.

In South Africa and New Zealand, the outstanding Eurobonds cover a sizeable part of the exchange rate risk of these countries' net external debt (Chart 1). The appeal of the bonds was probably increased by the fact that the currency of both countries has been the targ et of carry trade in recent decades. Although these two countries have bond portfolios which are of a similar size (40-50 billion dollars) and we can thus assume that investors have easy access to both markets, there is a major difference in terms of their size compared to the external debt of these countries. It should be noted that during the period under

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[2] *Carry trade* in the widest sense means that an investor takes out credit in a currency with relatively low interest rate, and uses the funds to purchase assets denominated in another currency having a higher yield. To realise an extra return, the investor always assumes the risk of exchange rate fluctuations. For more details on the topic, please refer to the article by Kisgergely (2010).

Chat 1

Net external debt[3] and amounts of Eurobonds issued of New Zealand, South Africa, Hungary and Turkey
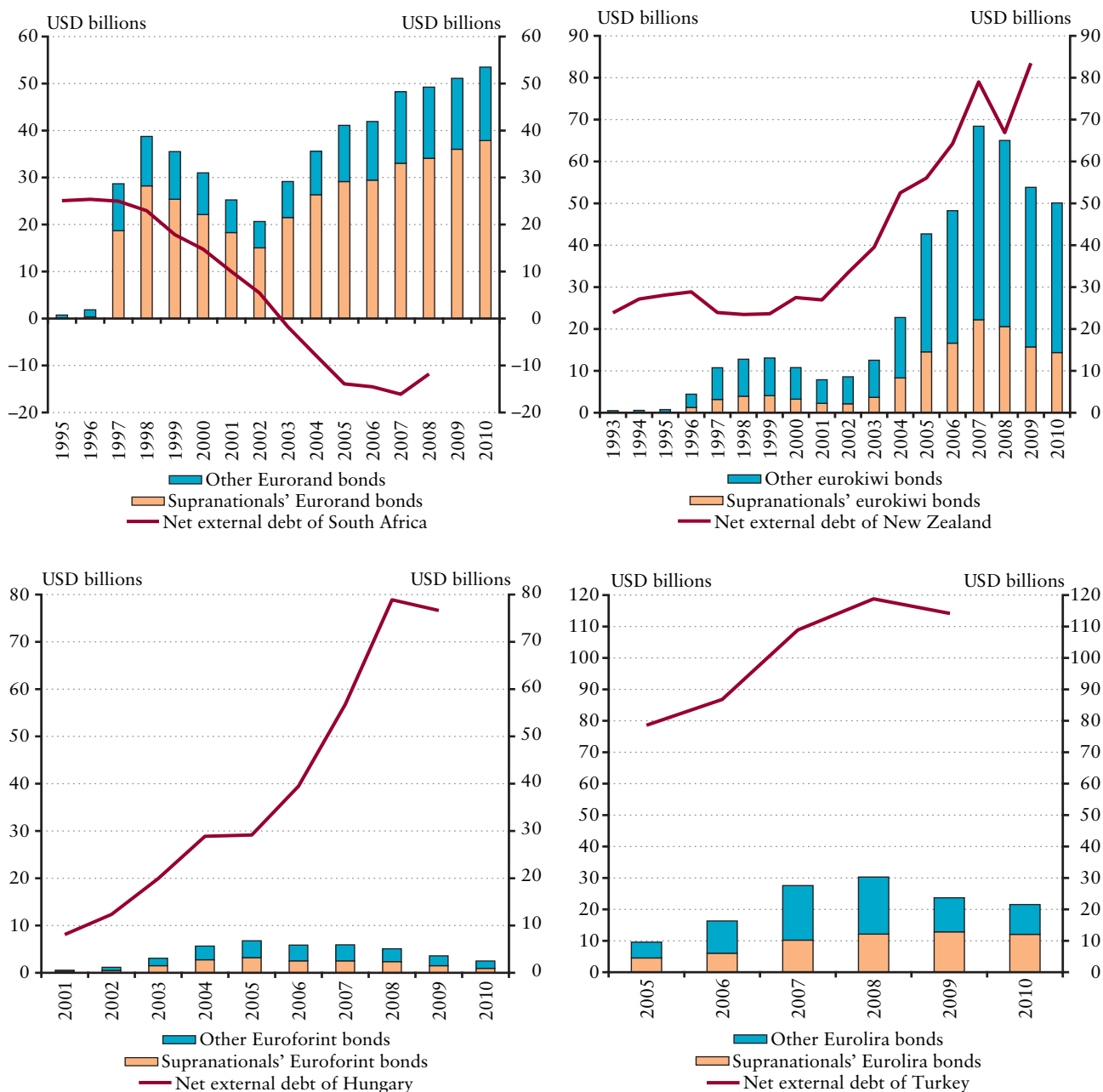
review the net financing need of the general government was lower in New Zealand, and thus investors seeking to take up positions in New Zealand dollar appreciated the instruments, which were no less liquid than sovereign bonds but carried no credit risk.

By comparison, in the case of two other countries (Turkey and Hungary) with currencies bearing similarly high interest, both the volumes of the issues and their ratios to the external debt are much lower than in New Zealand and South Africa.

THE ISSUE PROCEDURE IN THE CASE OF A SUPRANATIONAL ISSUER

In order for the Eurobonds to actually perform their role in the real economy as described above, that is, allowing the funds raised by international financial institution in the

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[3] Net external debts do not include special purpose vehicles.

given currency to reach the borrowers in the same economy, generally further financial instruments are needed. Sometimes the issuing international institution lends the borrowed funds directly to the credit institutions of the given country. This, however, seldom happens. In most cases the issuer ultimately intends to obtain euros or dollars, and uses derivative transactions to convert the borrowed funds.

The example below illustrates this case. We assume that an international financial institution issued forint-denominated Eurobonds (euroforint bond). However, it actually seeks to obtain funds denominated in euro at long maturity and floating interest rate. The interest rate and currency mismatch can be eliminated with interest rate swaps.

For this, the issuer needs to conclude two swap transactions – with identical maturity dates to that of the bond issued – with another financial institution, generally with the investment bank acting as the lead manager for the bond issue. In the course of the first swap, an interest rate swap (IRS) transaction, the issuer receives a fixed forint interest used to cover its interest payment obligation deriving from

the bond issue on the one hand, and pays a floating forint interest (typically corresponding to the 3-month BUBOR), on the other. If the yield of the bond[4] is lower than the fixed interest established in the interest rate swap transaction, the issuer may interpret the difference as a quasi commission-type income received in consideration for its reputation and AAA rating.

The second swap transaction is a so-called cross currency basis swap, whereby the issuer, having incurred a floating forint interest payment obligation, swaps this interest with a floating euro interest rate against a fee (cross currency basis swap spread). Whether the fee is paid or received by the issuer depends on the positive or negative value of the cross currency basis swap spread for the currency pair in question. Thus, in net terms, the issuer received a fixed forint interest and pays a floating euro interest. Concurrently, the counterparty of the forint interest rate swap transaction will receive a floating forint from the bond issuer and pays a fixed interest therefore. Similarly, the counterparty bank of the cross currency basis swap will pay a floating forint interest and receive a floating euro interest.

Definition of interest rate swap and cross currency basis swap

An interest rate swap is a contract between two parties to exchange their interest payment obligations in a specific currency. During the term of the swap one of the counterparties pays a floating interest rate (generally specified as a short-term inter-bank reference yield, e.g. the 3-month LIBOR, and a pre-determined premium[5]) to the other, who in turn pays a fixed interest. The transaction does not involve the exchange of the notional principal underlying the swap, in practice only the difference in interest payments is credited. The party paying the fixed rate (payer) profits from an increase in the short-term reference rate, while the party receiving the fixed interest (receiver) profits from a decrease in the rate.
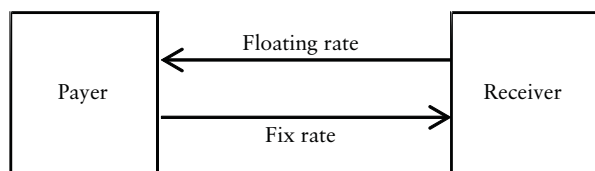
In a cross currency basis swap, at the time of concluding the transaction the underlying forint and foreign currency amounts are exchanged at the prevailing spot exchange rate. One of the parties pays the short-term inter-bank reference rate in currency "A", while the other pays the inter-bank rate of the corresponding maturity in currency "B". At the time of concluding the transaction, the parties specify a fixed (annualised) fee payable by one of the parties to the other on the due dates of interest payments. This fee is called the cross currency basis swap spread, the value of which is expressed in basis points and added to the interest paid in the floating currency (e.g. in the case of a EUR/HUF transaction, HUF). The amount of the spread depends on the extent of the counterparty risk on the one hand, and on the relative demand for the currencies on the other. In the event that the forint is in relatively high demand among Hungarian banks, foreign banks expect a premium for satisfying this demand for forint through the cross currency basis swap. Conversely, if Hungarian banks show relatively higher demand for euro than forint from their foreign counterparties,

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[4] High-grade issuer, benchmark-size issues, and Euroclear eligibility are the main factors that contribute to the relatively low yield of those bonds.

[5] On the inter-bank market interest rate swaps are generally quoted LIBOR-flat, i.e., the premium beyond the LIBOR and the fixed interest rate are netted.

the cross currency basis swap spread will be negative. Forint cross currency basis swap spreads have been negative for years, which is fully consistent with the fact that Hungarian banks would prefer financing foreign currency credit with foreign currencies, while setting no demand for forint.
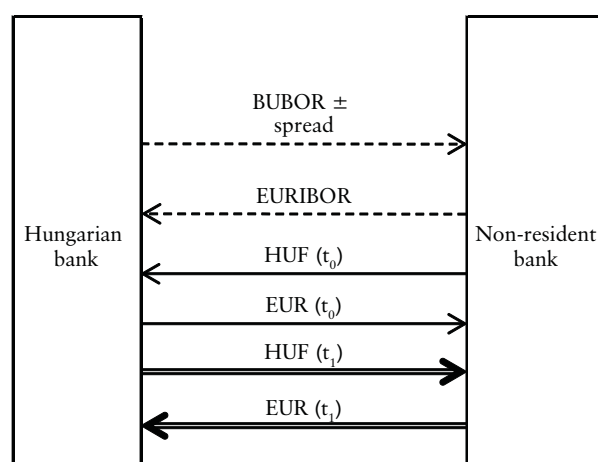

If we assume that the issuer concludes both swap transactions with Hungarian banks, we find a potential method for the Hungarian banking system to borrow funds abroad. In this case, the Hungarian bank pays a fixed forint interest during the term of the interest rate swap, and exchanges the received floating forint interest with a floating euro interest income by way of the basis swap. Thus, if a Hungarian bank borrows a euro credit bearing a floating interest rate on the inter-bank market, it will finance it with the euro payment leg of the swap, and in net terms it will only be obliged to pay the fixed forint interest and the spreads on the EURIBOR and the BUBOR rates. Consequently, these swaps helped the domestic bank to ultimately undertake a long-term forint debt with fixed interest rate by borrowing a euro-denominated credit with floating interest, which is much easier to access and finance.

Chart 2

Typical cash flows in euroforint bond issues
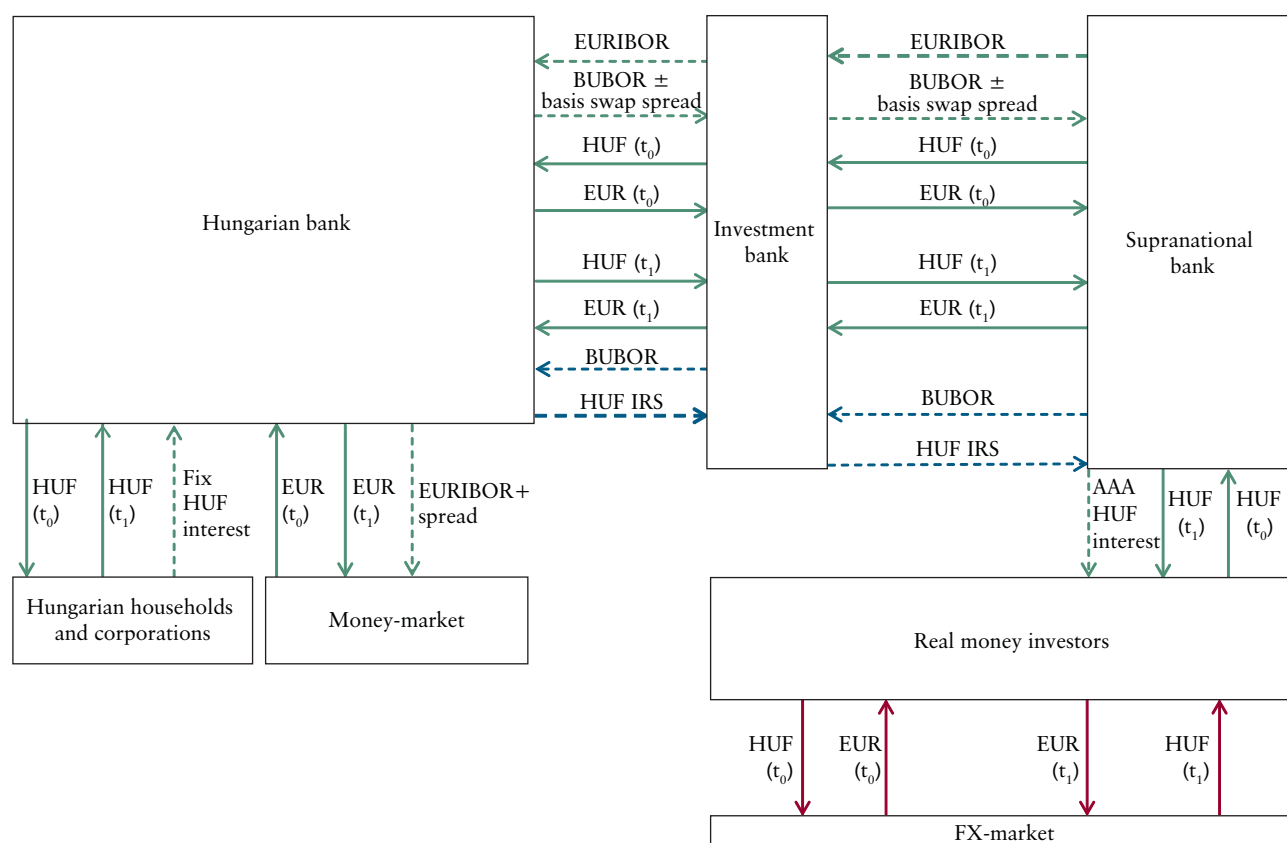
As a result of the above transaction, the lending operations of the Hungarian bank, already in possession of fixed rate forint funding, can shift to the placement of forint credit. Households and companies prefer taking out fixed interest credit in their domestic currency, and this demand can be satisfied with the credit products of the domestic bank bearing a fixed interest. For this, the bank needs to have available funds denominated in its domestic currency, for which it pays a fixed interest to minimise the interest rate risk.

It is worth noting that the borrowed forint can be used for purposes other than financing forint credit placed with a fixed interest rate as well, e.g. for the purchase of other forint instruments, among others, government securities, without assuming an exchange rate risk.

Investors buying the bond obtain the currency required for the purchase on the spot foreign exchange market. Typically, these are investors seeking to buy assets yielding high interest, thus they pursue a carry trade strategy; at the same time, they are not allowed to carry high risk assets (e.g. securities of emerging market governments) due to their risk management rules or for other reasons in their portfolio.

Taking a specific example, the model illustrated by Chart 2 will operate as follows: the supranational issuer can issue a 3-year forint bond with a 6.5 percent yield. At this time, the fixed leg of the forint interest rate swap with corresponding maturity amounts to 7.25 percent, while the forint-euro cross currency basis swap spread is -100 basis points. The issuer will realise a 0.75 percent interest gain on an annual level on the difference between the 6.5 percent and the 7.25 percent, as against the 100 basis point interest expense arising from the cross currency basis swap, which means that under these conditions the bond issue and the associated transactions result in an annual loss of 25 basis points. If the cross currency basis swap spread decreased to -50 basis points, the issuer could attain a 25 basis point profit on the transaction.

If the issue is carried out under the above conditions, it will yield the following results:

- *Domestic households* and companies can take out credit denominated in the domestic currency and bearing a fixed interest rate (or at least with long interest payment periods) at possibly more favourable prices than otherwise.

- *The domestic bank* can place mortgage loans denominated in the domestic currency and with long interest payment periods, while the cost of funds will correspond to the sum of the fixed rate of the swap transaction and the basis

swap spread. The bank could in fact finance the mortgage loan denominated in its domestic currency with a foreign currency, however, that would create an open exchange rate position for the bank. At the same time, in the course of the transaction discussed above, the exchange rate risk is assumed by the ultimate investors.

- *The international financial institution* obtains funds in dollar or euro on which it pays a floating interest rate. In addition, as a commission-type income (that may be construed as a premium for reputation/good credit rating) it will also receive the difference between the yield of the bond and the yield of the swap of the currency with corresponding maturity.

- *The foreign ultimate investors* will hold bonds ensuring a fixed yield, at a rate similar to that offered by the securities of emerging market governments, however – as they were issued by a bank rated AAA – they are practically risk-free. In addition, they take up a long exchange rate position in the given currency.

DEVELOPMENTS IN THE EUROFORINT BOND MARKET COMPARED TO INTERNATIONAL TRENDS

In the second half of the 1990s Eurobond issues denominated in high yielding currencies expanded dynamically worldwide. The largest volumes were issued in Turkish lira, South African rand and Australian and New Zealand dollar. In case of all four currencies, bond issuers are dominantly supranational banks. Currently, these institutions have and outstanding amount of bonds issued coming out at nearly 700 billion dollars, 70 percent of which was issued in the low yielding currencies of advanced economies. The rest of the outstanding bonds is comprised of high yielding currencies of advanced and emerging countries. Of them, we will discuss New Zealand and South Africa in greater detail.

From among high interest Eurobonds, the market of securities issued in New Zealand dollar boasts the longest history, and even at present the market of the so-called eurokiwi bonds (see Footnote 1) serves as reference for this securities type. The first issues took place late 1980s, and during the decades since then there have been two larger waves of issues: in the second half of 1990s and then again, in the years after the turn of the century the annual volume of securities issued approached 10 billion New Zealand dollars. The bonds issued had an average of three- to four-year maturity. The considerations behind the issues are clearly evidenced by the – not too close – correlation between the volumes issued and the 2 and 3-year interest

Table 1

Currency composition of bonds issued by supranational institutions[6]

(August 2010)

Developed market currencies		Emerging market currencies	
EUR	37.5%	ZAR	2.97%
USD	33.6%	TRY	1.18%
AUD	6.26%	BRL	1.04%
GBP	6.1%	RUB	0.54%
JPY	4.4%	PLN	0.28%
CHF	1.7%	MXN	0.23%
NZD	1.18%	CZK	0.20%
CAD	0.95%	HUF	0.09%
Other	1.58%	Other	0.13%

Source: Bloomberg.

rate swap spreads, that is, high volume issues took place at times when the potential issuers could anticipate a considerable income from the difference between the interest on the bond and the yield realised on the interest rate swap. As a rule, issuers used the obtained New Zealand dollar liquidity – through interest rate swaps – to finance New Zealand banks (Drage et al., 2005).

South Africa started the issue of eurorand bonds late 1995. Until 1997 the market showed relatively modest expansion, in 1996 bonds worth 1 billion USA dollars were issued. The breakthrough came in 1997, when the value of eurorand bonds, including 10- and 30-year securities reached as high as 15 billion dollars (IMF, 1997). The issuers used the rands received for purchasing South African instruments (government securities). In the past years, evolution of the eurorand market has continued, and the currently outstanding bond portfolio exceeds the value of eurokiwi bonds outstanding.

Compared to these countries, the market of euroforint bonds only saw a slight development over the past ten years. The portfolio of bonds issued in forint by foreign economic agents abroad amounted to just approximately 520 billion forints at the end of March 2010. Nearly 70 percent of this portfolio comprises plain vanilla bonds, the rest consists of ABSs, CDOs and securities tied to various indices. As for the issuers, basically three groups can be distinguished: international organisations, financial institutions operating a subsidiary in Hungary and banks pursuing business operations independently from Hungary.

Financial institutions operating a subsidiary in Hungary account for 10 percent of euroforint bond issues. In their case (e.g. Erste, Citigroup, KBC, Unicredit) the issues could

have served to hedge their asset-side forint exposure (loan from the parent company).

The bonds issued have an average term of 3 years, while the average volume of the individual series is 7 billion forints, being somewhat higher in the case of supranational banks and lower for the other issuers. Forint bonds issues by supranational financial institutions account for nearly 55 percent of the entire market. This ratio is essentially the same as in the case of the currencies of other emerging economies. We can reasonably assume that similarly to the case of the other examined countries, the appearance of issues by supranationals also stimulated the market in Hungary.

The question arises why has the euroforint bond markets remained relatively immature compared to the eurokiwi and eurorand markets. One of the most notable reasons is that of the transactions described above, *cross currency basis swap* became available in Hungary only after foreign exchange liberalisation. At the same time, as demonstrated below, on the one hand, during the period elapsed since, the pricing of the interest rate swaps shown in the financing model has scarcely allowed potential issuers to realise a profit on the issue, while on the other hand, lead manager banks incurred a loss on the interest rate swaps already concluded due to the subsequent evolution of short-term forint and euro interest rates.

MOTIVES OF THE ISSUERS

Beyond inter-bank borrowing, the fund-raising operations of supranational banks are also complemented by the cross currency interest rate swaps described above. In the course of the latter, bond issue generally takes place without a pre-defined issue plan and without targeting a specific currency basket.

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[6] EBRD, EIB, World Bank.

Chart 3

Yields on 3-year bonds issued in New Zealand dollar (on the left) and forint (on the right), vs. interest rate swap yields and bond issue volumes
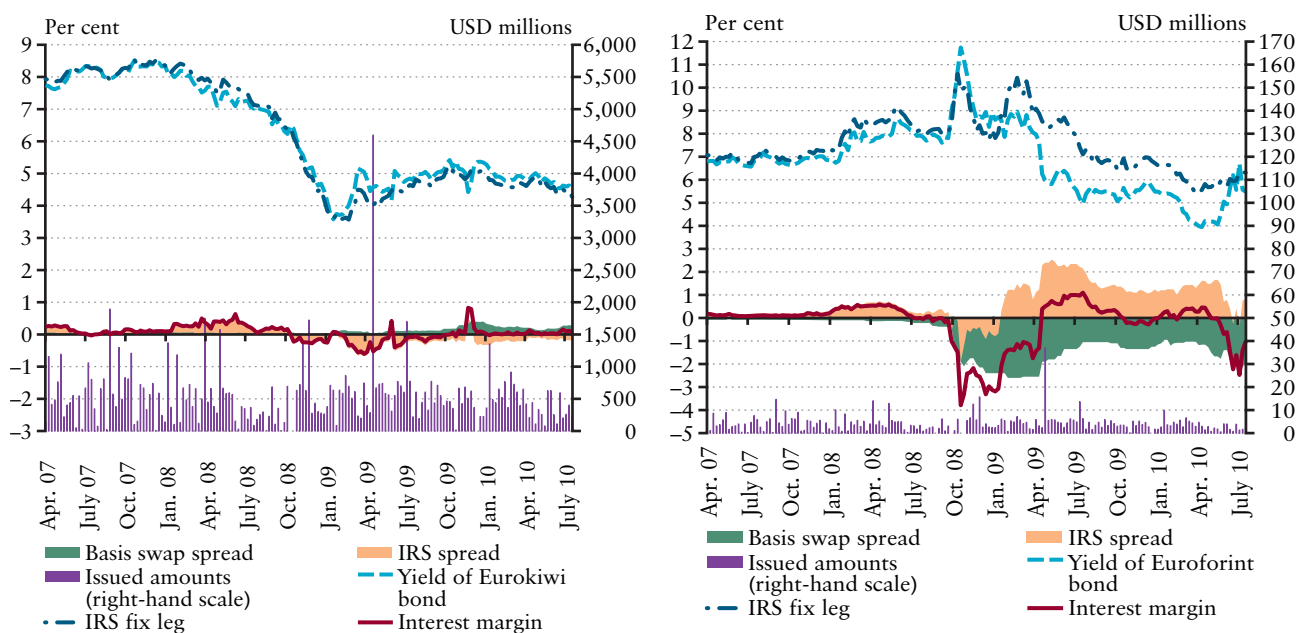
Forrás: Bloomberg.

Issues are primarily determined by demand, that is the requirements of the ultimate bondholders. It is only worthwhile for a bank to issue a bond denominated in a high interest currency if the associated transactions can drive the cost of financing below the level of the interest on alternative dollar or euro financing. In a cross currency interest rate swap transaction, the supranational issuer receives the fixed leg of the New Zealand interest rate swap and pays the 3-month USD LIBOR. The difference between the fixed leg of the interest rate swap and the yield of the bond, adjusted by the cross currency basis swap spread will reduce the cost of funds for the bank by a fixed amount, which in this case corresponds to the 3-month USD LIBOR.

If the balance of these cash flows exceeds the sum paid as interest on the issued bond, the margin will be positive. At the time of making the decision on the issue, the question arises whether the amount of the 3-month USD LIBOR and the bond yield will exceed the New Zealand interest rate swap yield and the interest of the credit – tied to LIBOR – placed. In case of issues of bonds with a 3-year maturity during the period preceding the bankruptcy of Lehman Brothers, interest rate swap transactions reduced the cost of funds by an average of 20 basis points annually in the case of New Zealand dollar (see Chart 3).

Though this level falls behind the 30-60 basis points typically attained in the second half of the 1990s – the period of rapid

expansion in eurokiwi issues – the volume of issues has not decreased substantially. Since October 2008 the spread has been mainly negative, and this resulted in a fall in the volume of issues. In the case of forint issues, the spread was considerably higher in the past three years, at 35-40 basis points on average in 2007–2008, then falling to around 0 basis point from the second quarter of 2009. Nevertheless, forint-denominated bonds were issued less frequently and in lower amounts than eurokiwi bonds. Though the negative interest margin poses a tangible barrier to the issuers, during periods when issues failed to increase despite a positive margin, the reason behind the relative unpopularity of these transactions should be sought on the demand side.

MOTIVES OF HUNGARIAN BANKS

Currently, the conditions for raising fixed-interest forint funds abroad are still unfavourable in the Hungarian banking system, even if domestic companies and households would generate demand. To realise the forint borrowing transaction described in this article, Hungarian banks should have substantial excess foreign currency liquidity or should at least be able to raise such funds on the international inter-bank market. Currently, the majority of Hungarian banks is in the opposite position.

In the balance sheet of the Hungarian banking system, there is a discrepancy between the currency composition of assets

and liabilities; this situation has evolved during recent years because the expanding foreign currency lending is mainly offset by forint deposits on the liability side. Accordingly, domestic banks have an exposure against forint (*long* foreign currency, *short* forint position) in their balance sheet. Closing of the entire open position is ensured by FX swap transactions. However, from the bank's perspective the forward leg of the foreign exchange swap transactions – appearing as an off-balance sheet item – represents foreign currency liability and a concurrent receivable in forint, thus it results in the closure of the total open foreign exchange position (balance sheet and off-balance sheet) (Table 4).

Thus, in previous years Hungarian banks have acted as borrowers of an increasing amount of foreign currency by using FX swap transactions (Chart 4). This strong demand for foreign currency and supply of forint has been clearly reflected in the evolution of a cross currency basis swap spreads since October 2008 as a result of the decline in inter-bank euro liquidity, and later the reduced risk propensity limits towards the Hungarian banking system. The negative cross currency basis swap spread means that a Hungarian bank with abundant forint liquidity will pay lower interest on the forint received in the course of a cross currency basis swap than the short-term inter-bank rate. In other words, a Hungarian bank experiencing tension in foreign currency liquidity would only be willing to lend euros to a foreign bank if it received the short-term EURIBOR interest and the forint funds borrowed in the transaction secured an extra income offsetting the effects of giving up its euro liquidity.

The Hungarian banking system would only be capable of integrating this transaction in the financing model specified in the section entitled "The issue procedure in the case of a

Chart 4

Evolution of the foreign currency demand of Hungarian banks and cross currency basis swap spreads

Source: Bloomberg, Reuters, MNB.

supranational issuer" if its open foreign exchange positions recognised in its balance sheet decreased markedly by either downsizing the volume of foreign exchange loans or by increasing the foreign currency liabilities. Although this is not possible in the short run, in the longer term this barrier most likely be removed by the gradual decrease in the FX-loan portfolios.

MOTIVES OF INVESTORS

According to anecdotal information, Eurobonds are purchased by institutional investors with a conservative risk profile on the one hand, and small investors of developed countries, on the other. Typically they are willing to take no or only minimal credit risk, but at the same time, seeking to realise a higher interest they are not deterred by an exchange rate risk. They primarily seek foreign currencies supported by a credible and prudent economic policy which mitigates the risk of sudden exchange rate depreciation. Another advantage is a clearly defined factor which influences the exchange rate, e.g. commodity prices offers the potential for the appreciation of the given currency in the long run.

Below we provide a more detailed analysis of three currencies in which supranational banks issued eurokiwi-type bonds. Seeking the explanation for the varying interest of investors in these three currencies, we compare the bonds denominated in forint which is relevant to us, the quasi traditional New Zealand dollar-based bonds and the South African rand-based bonds issued in a considerable volume.

We compare the performances and risk levels relating to bonds issued by supranational banks, with those of portfolios comprising the government bonds of these countries, as well as with those of the *carry trade* positions taken up in respect of the examined currencies. We simulate these three investment strategies in respect of the three currencies based on monthly data for the period between January 2007 and August 2010 and converted to US dollar. We provide three explanations for the investor attitude towards eurokiwi-type bonds. Our first hypothesis is that bond buyers possibly find bonds issued in high yield currencies but also having a relatively stable exchange rate more appealing. Secondly, we assume that AAA-rated bonds denominated in the currency of countries with riskier government securities are higher in demand than those of countries where the government securities are nearer to the AAA rating. We derived this assumption from the fact that investors who may only carry low-risk (e.g. rated AA or higher) securities are able to undertake a risk in New Zealand dollar by buying government securities, but can only do so in forint by buying low-risk euroforint bonds. Thus, euroforint bonds could yield a higher margin for them
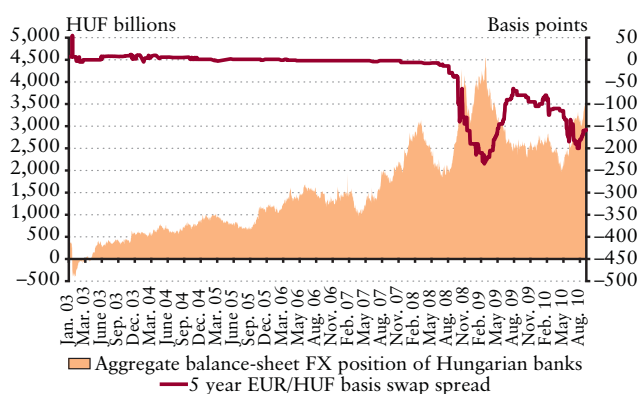
Table 2

Comparison of investment strategies in the case of the three examined currencies

	AAA-rated eurobond investment		Government bond investment		Carry trade on the FX-market	
	Annualized return	Sharpe ratio	Annualized return	Sharpe ratio	Annualized return	Sharpe ratio
NZD	2.34%	0.10	5.85%	0.29	8.36%	0.41
HUF	1.17%	0.05	2.69%	0.10	5.38%	0.30
ZAR	−6.27%	−0.27	−0.97%	−0.05	9.65%	0.47

Source: Bloomberg, Datastream.

than eurokiwi bond. Furthermore, we also assume that regardless of the above mentioned two factors, among Eurobonds, securities with a higher Sharpe-ratio[7] will be preferred.

We map the motives and alternative investment options of the investors by examining the abovementioned three strategies. The results verified our first hypothesis only partially. Eurokiwi bonds boasted the highest Sharpe ratio (Table 2), which is consistent with the fact that they attract the most intense interest among investors, based on the frequency and amount of these issues. Based on the volumes issued and their inherent risk level, we expected that eurorand bonds would ensure a more favourable yield than euroforint bonds. However, this assumption was not underpinned by evidence, which may imply that the buoyant demand for eurorand bonds is significantly influenced by factors which cannot be identified with quantitative methods. In addition, it may be reasonable to deduce that the demand for eurorand bonds is driven by market actors which are able to hedge the tranche of the yield arising from exchange rate fluctuations. These investors are probably South African residents.

Our assumption that bond buying investors possibly prefer bonds issued in currencies yielding high interest, but also having a relatively stable exchange rate was not verified. The yield realised by those pursuing a carry trade strategy significantly exceeded that of Eurobond investments. This may imply that *carry trade* strategies are played in the foreign exchange market rather than on the Eurobond market.

The findings seem to support our assumption that in the case of countries issuing government securities with weaker ratings, investors may find Eurobonds more appealing. During the period under review, New Zealand government bonds were rated 'AAA', South African government securities

'A+' while Hungarian government securities were downgraded from 'BBB+' to 'BBB−'. During this period, of the three government securities portfolios, a positive yield could be realised on the forint and New Zealand dollar portfolios, while those holding South African government securities incurred a loss. For those investors whose risk management principles did not set an effective restriction as to credit rating, buying government securities proved to be a more valuable investment than buying Eurobonds, in the case of all three currencies. This also means that those investors for which credit rating posed an effective limitation could only by AAA-rated Eurobonds, nevertheless, the performance of their portfolio did not significantly differ from that of the government securities portfolios.

CONCLUSIONS

Despite the small number of issuers, eurokiwi-type bonds have a relatively liquid market. Although hypothetically this market allows domestic sectors to hedge the exchange rate risk of external debt, there are only a few examples for its actual realisation among small, open economies. In the case of countries where issuers were able to achieve a positive interest margin on the transaction in recent years, the volume of the outstanding bond portfolio is relatively high. Although in the case of Hungary there is a significant surplus between the bonds to be issued and the interest rate swap yields with corresponding maturities, issuers would sustain a loss on bond issues due to the deeply negative value of the cross currency basis swap spread. As for cross currency basis swaps – reflecting the strong need of the banking system for liquid foreign currency – have been in the negative band for years in Hungary. Any positive development could only be observed in the event of a fundamental change of the key underlying factors; however, this is unlikely to happen over the short run as it would require a change in the sign of the open balance sheet positions of the banks, which can only take place

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[7] The Sharpe ratio is a measure of the excess return per unit of volatility on an asset carrying a risk. In other words, from among investments having the same volatility (identical risk) the one yielding the highest return will have the highest Sharpe ratio. This investment will compensates the investors to the largest extent for the given risk taken. A negative Sharpe ratio indicates that the given investment secures a lower return than a risk-free yield.

concurrently with phasing out their foreign exchange loan portfolio. There are several reasons for not applying this financing method in Hungary instead of intensifying foreign exchange lending operations in the previous years. On the one hand, borrowers having compared the levels of exchange rate risk and interest rates found foreign currency loans more attractive than forint loans which, though they carried no exchange rate risk, were characterised by somewhat higher interest rates. On the other hand, investors showed a modest interest in euroforint bonds on the international financial market, largely attributable to the sizeable supply of Hungarian government securities offered to market agents intending to take up a forint position. Thus, only a relatively narrow set of investors – forced by their risk management rules – could opt for euroforint bonds only.

Over the long run, the Hungarian banking system will only be able to tap the euroforint market and draw on forint funds with longer re-pricing periods abroad if becoming indebted in forint becomes attractive for domestic borrowers, and concurrently foreign savers and investors consider macroeconomic prospects sufficiently reliable and appealing to assume the exchange rate risk.

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Gergely Kiss: Experiences of European crisis management: the reform of economic policy coordination

This article is intended to present the new, (re)forming elements of economic policy coordination, an instrument playing a central role in the EU. One important lesson drawn from the crisis is that in order for the EU to become a stable, dynamically growing economy – in addition to its internal market (in particular, the free movement of capital) and a single monetary policy – there is a need for efficient coordination, which should also be credible for the markets. Economic policy coordination – the alignment of national fiscal policies to one another and, for euro area Member States, to the common monetary policy – is a key issue, and the intention to reform it is closely related to the crisis management of the past two years.

The proposals presented thus far indicate that EU policy makers are firmly committed to setting up economic policy coordination mechanisms which are far more efficient than those already in place. Accordingly, they will rigorously assess both fiscal and real economic imbalances, and after the imbalances have been identified, they will readily enforce corrective mechanisms, including sanctions more severe than those already in place. Rules governing crisis management will certainly be clearer; however, in order to minimise moral hazard, the common European rescue package will continue to have a hefty price tag.

It is a warning sign, however, that despite firm policy intentions, markets remain rather sceptical about the reform of the fiscal framework and the ability to guarantee the sustainability of fiscal policies, as indicated by the sovereign credit risk premia, which by September had risen to the levels observed in May.

INTRODUCTION

This article presents the new, (re)forming elements of economic policy coordination, an instrument playing a central role in the European Union (EU). One important lesson drawn from the crisis is that in order for the EU to become a stable, dynamically growing economy – in addition to its internal market (in particular, the free movement of capital) and a single monetary policy – there is a need for efficient coordination, which should be credible for the markets as well. Economic policy coordination – the alignment of national fiscal policies to one another and, for euro area Member States, to the common monetary policy – is a key issue, and the intention to reform it is closely related to the crisis management of the past two years. In our analysis, the proposals are presented within a broader economic context with a retrospective view of the extraordinary policy measures taken as a response to the global financial crisis. The primary purpose of this article is to provide information about the still ongoing thinking process that is taking place in European institutions and major Member States.

The structure of this article is as follows: first, we provide a brief overview of the extraordinary policy measures taken since autumn 2008 and, subsequently, we proceed to address the second wave of the crisis in the EU and describe the proposed new elements of the coordination directly in relation to the intensification of sovereign risks.

REASONS FOR THE FISCAL AND MONETARY EASING

In the autumn of 2008 the repercussions of the global financial crisis were spreading rapidly to the real economy. Striving to reinforce the stability of the global financial system, governments and central banks around the globe implemented extraordinary measures and adopted fiscal and monetary easing to counter the deepening recession. It was clear from the start of crisis management that recovery from the global crisis hinged upon the concerted action of major economies and, in recognition of this necessity, the negotiations of the G20, which comprises the world's largest economies, assumed an increasingly important role and introduced the most important crisis management measures.

Decision-makers were also aware that the extraordinary measures they adopted could only be effective if the fiscal easing did not prompt markets to call into question the sustainability and the long-term equilibrium of the economies.

The fiscal easing, which was rather pronounced across the European Union, took place within the framework of the EERP (European Economy Recovery Plan). It is difficult to present exact figures, but by 2009 the consolidated ESA-based EU budget deficit – which also includes the deficit increasing effects of the automatic stabilisers in times of recession – increased to 6.9 percent from the 2.8 percent observed in the previous year, while the increase in the debt ratio between 2007 and 2010 amounted to around 20 percentage points.[1] According to the ECB's estimates (ECB 2010a), the fiscal packages provided under the EERP in the euro area amounted to 2 percent of GDP over a two-year period (2009–2010).

It should be noted at this point that this significant fiscal easing alone gave rise to considerable tensions as regards compliance with the provisions of the Stability and Growth Pact (SGP). Of the 27 Member States 25 countries are currently subject to the so-called excessive deficit procedure (EDP). This means that, with deficit ratios in excess of 3 percent of GDP, none of the EU Member States meets the budget deficit criterion except Sweden and Estonia.

Following the acute phase of crisis management, decision-makers shifted their focus to exit strategies, i.e. the reversal of extraordinary measures. The announcement of the exit strategy did not mean in itself that its implementation started immediately; it was merely intended to demonstrate to the markets the manner in which economic policy would return to normal functioning. A good illustration of a timely announcement of the exit strategy is the European Central Bank (ECB): as early as September 2009, in a much anticipated speech President Trichet provided a detailed overview of the ECB's exit strategy, stressing the ECB's commitment to price stability and the temporary nature of the crisis management measures. Nevertheless, the gradual re-absorption of monetary liquidity began only at a later phase, and the ECB's key interest rate stands at a record low, 1 percent, even as of September 2010.

Fiscal consolidation is perhaps an even more pressing issue. We might state in general, that fiscal easing is only an option if it does not call into question the sustainability of public finances. Even if such is the case, it will not have a noticeable stimulating effect if the private sector immediately starts offsetting it by increasing its savings in anticipation of a future fiscal tightening (Ricardian equivalence).[2] At the time the crisis management plan was adopted most signs indicated that the fiscal policy had accumulated sufficient credibility for the fiscal stimulus to generate a short-term effect. However, it was clear that the fiscal policies of individual Member States had to start addressing the issue of consolidation as well, and finding an answer, as soon as possible, to two questions: at what levels individual Member States intended to stabilise their debt ratios, and where they would find the funds for the consolidation that was required to achieve that target.

INTENSIFICATION OF SOVEREIGN RISKS, THE SECOND WAVE OF THE CRISIS

The first results of the fiscal stimulus were very positive: the EU economy demonstrated a quarter-on-quarter growth from as early as the middle of 2009 and, amid gradually restored confidence in the capital markets, credit spreads began to decline markedly. For the EU, however, new tensions started to simmer under the surface. While the G20 negotiations were sufficient at the global level, as regards the EU – in particular, the euro area – the attempt to align fiscal policies to the regulatory framework imposed by the Stability and Growth Pact (SGP) failed to produce convincing results. Indeed, following the overheated period of the preceding years, the depth of the recession faced by certain Member States was so astounding that – given the lack of firm fiscal measures – it raised increasing concerns about the sustainability of public debt.

While the sustainability of the debt trajectory is crucial for each country; in the case of the euro area two additional aspects should be considered in its assessment. On the one hand, even though the deep economic recession might warrant further monetary easing in a specific country, under the single monetary policy it is impossible to adjust monetary conditions to address the problems of a single Member State. On the other hand, as the single currency implies joint fiscal responsibility, leaders of the euro area concluded that none of the Member States should be allowed to go bankrupt; nonetheless, the moral hazard arising from the European aid also need(ed) to be addressed. Indeed, the SNA clearly declares that neither the European institutions nor the ECB can rescue individual Member States (no bail out).

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[1] In addition to high deficit levels, the stimulus packages provided by the government to the financial sector during the crisis largely contributed to the increase in the debt ratio.

[2] In fact, the arising of the Ricardian equivalence is somewhat more complicated than that: with sufficiently heterogeneous economic participants, fiscal stimulus could easily have a material short-term effect.

A frequent form of "assistance" applied at the national level in previous decades was the direct provision of central bank financing to the government, in other words, turning on the money presses. Obviously, this did not solve any problems over the long run and merely induced inflation, but over the short run it was a convenient solution for governments. Contemporary central bank acts provide for the prohibition of monetary financing precisely to prevent this kind of practice at the institutional level. In the case of the EU, this specifically means that the ECB and the other central banks are not allowed to extend loans to public institutions, and cannot purchase the government securities of individual Member States directly in the primary market.[3]

In early 2010 – during the intensification of the Greek crisis – decision-makers of the Union were tied up for months with debates over the moral hazard associated with European assistance and rescue.

It was not until May 2010 that a clear and resolute response was agreed upon, when several crisis management measures had to be adopted at an extraordinary weekend meeting prompted by the renewed escalation of market tensions. As a result, the Council of Economic and Finance Ministers (Ecofin), in cooperation with the IMF, decided to set up a massive (EUR 440 billion) common euro area fund (European Financial Stability Facility, EFSF),[4] which can be used by distressed euro area Member States if financing themselves from the market is no longer possible. Loans granted by the fund are guaranteed by euro area Member States. In each case, when a Member State indicates that it seeks this assistance, the Member States jointly extending the loan must make a separate decision in line with their own national regulations.

Simultaneously, the ECB also passed a number of important decisions: it announced that, with a view to restoring the normal functioning of the monetary transmission mechanism, it would begin to purchase government securities in the secondary market (Securities Market Programme, SMP). It also introduced additional liquidity providing instruments. In addition, Member States expressed a firm commitment to pursuing a sound fiscal policy and, to this end, decided to reform the fundamentals of economic policy coordination.

Before providing an economic assessment of the individual items in the proposals, it is worth looking at the prevailing rules and their practical weaknesses.

THE EXISTING SYSTEM OF ECONOMIC POLICY COORDINATION

As the official title of the euro area, the Economic and Monetary Union (EMU), aptly indicates the – currently – 16 Member States[5] not only constitute a monetary union, but they are also expected to coordinate their national economic policies, in general, and their fiscal policies, in particular. From the perspective of economics the explanation is rather simple: a common monetary policy can only accomplish its primary mission – price stability – if it is supported by a sound fiscal policy. In practice, the rules are set out by the Stability and Growth Pact (SGP).[6] The regulation has two particularly vulnerable aspects. On the one hand, it must be ensured that each Member State pursues a sound fiscal policy and that new Member States are not allowed to become a "free rider" to benefit from the stability of the euro area as a whole. On the other hand, the rules should define unambiguously what "sound fiscal policy" means and how to impose it on Member States. The SGP does not apply to euro area members only; the rules it sets forth must be observed by all EU Member States. However, there is an important difference: the assessment of the fiscal convergence criteria during the accession process focuses on two specific figures: public debt cannot exceed 60 percent of GDP,[7] and the general government deficit must be below 3 percent of GDP. There is another difference, which is relevant to Hungary as well: in the case of EU Member States outside of the euro area, a breach of fiscal rules has not resulted in any material sanctions thus far. Although the applicable rules of the excessive deficit procedure (EDP) empower the EU to suspend payments from the Cohesion Fund to any Member State if the Member State concerned persistently fails to act upon the recommendations aimed at reducing the deficit, this has never been applied in practice.

At the time the rules were formulated, no-one expected that a severe crisis such as that observed in the first half of 2010 would unfold barely 10 years after the euro had been adopted. At the beginning of the year, "only" a few Member States were

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[3] Moreover, the ECB will not conduct interventions even in the secondary market of government securities unless these are necessitated by disturbances in the monetary transmission mechanism.

[4] In addition to the EFSF, they also established a so-called European Financial Stability Mechanism (EFSM), which can grant a loan or credit facility guaranteed by the EU up to EUR 60 billion, available to any EU Member State. (In addition to the two funds mentioned above, the so-called Balance of Payments assistance remains available to Member States not participating in the euro, the ceiling of which is currently EUR 50 billion).

[5] With the accession of Estonia, the euro area will consist of 17 Member States by 2011.

[6] Bences and Kutasi (2010) provide a current and detailed overview of the relevant rules.

[7] In case of a public debt level higher than 60 percent, a sufficiently diminishing debt ratio will suffice. This is the reason why Belgium and Italy were able to meet the fiscal criteria upon the adoption of the euro despite a debt ratio exceeding 100 percent of GDP.

subject to scrutiny in relation to their fiscal sustainability, as evidenced by the evolution of the CDS spreads, the measure of sovereign risk. Undoubtedly, during this period Greece was at the epicentre of the crisis. Greek risk premia soared to nearly 1000 basis points – a level never before seen in the EU. Market participants were no longer convinced that Greece could recover from the crisis on its own, and yet negotiations on a plan for international assistance progressed very slowly. As discussed above, owing to concerns about the moral hazard associated with potential EU assistance and the no bailout clause of the SGP, the decision-makers of the Union waited very long to reach a decision on the aid to be offered to Greece jointly with the IMF.

The Greek situation, however, had become a pan-European issue not only on account of its precedential value, but also because of the increasing threat of contagion of the crisis. By May market participants had began to lose confidence in the entire euro area. They had no way of knowing what resources and mechanisms were available to the euro area as a whole to support distressed Member States. Markets were extremely worried about a possible domino-effect induced by the potential defaulting of vulnerable countries, as it would have imposed too great a burden on the entire euro area for even the more stable countries to finance. On the one hand, these fears were reflected by the substantial weakening of the euro, on the other hand, they contributed to the disturbances in the government securities market and to the rising risk premia even for ostensibly more stable Member States.

In autumn 2010, all these facts clearly indicate that the European institutional system was unable to ensure fiscal discipline either in the euro area or in the broader EU, and that the European mechanism was not functioning smoothly during the process of crisis management. The crisis made decision-makers realise that the rules needed to be revised significantly, and that the future of the euro could not be secured without a serious reform. The specific proposals are presented below.

PROPOSALS AIMED AT THE REFORM OF ECONOMIC POLICY COORDINATION

As regards proposals for the future, we should look back to March 2010. In the spring, during the intensification of the Greek crisis it was already clear that the longer-term problems of the European economy had to be addressed at the EU level. Accordingly, the European Council (EC), which comprises heads of state and government, announced its new strategy – known as Europe 2020 – for the creation of jobs and the promotion of growth. The main elements of the strategy are aimed at increasing employment, improving

the conditions for education and R&D, increasing energy efficiency, reducing the emission of greenhouse gases and combating poverty. In addition, the Council decided to set up a Task Force (TF) headed by the President of the EC, Herman Van Rompuy, in which the finance ministers of the Member States and representatives of the ECB and the European Commission work together to develop an efficient crisis management framework and a series of measures required for greater fiscal discipline. The TF will present its final report and proposals during the October 2010 meeting of the European Council. Before looking at the details, we should note that, in parallel to – but institutionally independent of – the work undertaken by the TF, other, equally relevant reforms are being developed with a view to reinforcing financial stability (e.g. laying down the Basel III Directive, setting up the European Systemic Risk Board).

PROPOSALS OF THE VAN ROMPUY TASK FORCE (TF)

The first meeting of the Van Rompuy Task Force was held shortly after the turbulence in early May. At the start of the work process, participants agreed on four major objectives:

1. Enforce greater fiscal discipline; strengthen the rules of the SGP

2. Establish macroeconomic surveillance, similar to fiscal surveillance, as part of the process, reduce divergences in competitiveness between the Member States

3. Set up an efficient crisis management mechanism

4. Strengthen broader economic governance in institutional terms

At its second meeting, the TF provided further details on the first two issues, budget surveillance and macroeconomic surveillance. Within this framework, they intended to revise several points of the Stability and Growth Pact to ensure that Member States in breach of the fiscal rules may be sanctioned at an earlier stage and in a more gradual way. Specific proposals relevant to this issue are as follows:

• Adoption of the so-called "European Semester" as of 2011. Practically covering the first half of each calendar year, Member States would coordinate with the European Commission in respect of the main assumptions underlying their budgetary plans for the following year. Since this coordination would be concluded prior to the budgetary debates of each Member State, national parliaments would be able to make a decision in consideration of its results.

- Extend the early sanctions of the SGP, for example in cases where the level of debt rises too quickly even before the 3 percent deficit threshold is breached. Figuratively speaking, similar to traffic lights, you would now get a ticket not only for running a red light, but also for running a yellow light. At the same time, the TF stressed that the specific rules and sanctions would have to be defined precisely.

- The level and sustainability of public debt should play a bigger role in budget surveillance, especially for countries with a sharply rising debt ratio.

- There is a need to guarantee the independence of national statistical offices (by keeping data provision free from political pressures) and to ensure that Member States report sufficient and reliable statistical data.

As regards macroeconomic surveillance, one important conclusion drawn by the TF from the experiences of the crisis was that sound budgetary policies were necessary, but not sufficient to ensure the competitiveness of the economy. This may give rise to problems particularly for members of the euro area, where devaluation with a view to improving competitiveness is no longer an option. Accordingly, the TF proposed the application of indicators to monitor competitiveness and imbalances (scoreboard), and asked the European Commission to work out the specific details in that regard.

Based on the initial sub-report of the TF, the EC approved the main approaches and set a deadline – October 2010 – for the submission of the final report.

PROPOSALS OF THE EUROPEAN COMMISSION

By the end of June 2010, the European Commission had prepared its proposal presenting in detail the specific steps[8] outlined below.

In relation to macroeconomic surveillance, the European Commission proposed a two-stage approach.

In the first stage (prevention), the Commission would assess the external and internal imbalances of each Member State on the basis of an overall indicator system (scoreboard). Based on the emphatically non-mechanical assessment, the Council may issue country-specific proposals, which may include policy recommendations addressing a broad range of issues covering macroeconomic policies, labour markets as well as goods markets or macro-prudential matters. In

particularly serious cases, the Commission may recommend placing a Member State in an excessive imbalances position (similarly to the excessive deficit procedure).

The purpose of the second stage (correction) is to enforce compliance with the recommendations issued in relation to the specific case. The excessive imbalances position mechanism would apply to all EU Member States (in practice, it is expected to function in a manner similar to the excessive deficit procedure; in other words, the Council would issue recommendations to the affected Member State, the implementation of which would be regularly monitored). However, non-compliance with the recommendations would result in more stringent sanctions for euro area Member States, as in their case imbalances might jeopardise the entire euro area.

In the area of fiscal surveillance, first and foremost, the Commission emphasises the importance of high quality, independent statistics, and proposes that Member States develop national fiscal rules and multi-annual budgetary planning. The Commission dedicates a separate chapter to the significance of sustainable debt. In this context, as a preventive measure, the Commission would introduce stricter criteria for highly indebted countries in respect of the deficit. In this framework, Member States with debt ratios in excess of 60 percent of GDP could become subject to the excessive deficit procedure if the decline in debt falls short of the satisfactory pace of debt reduction. As regards corrective measures and the abrogation of the excessive deficit procedure, the Commission recommends the adoption of a simple and clear rule: with a debt ratio exceeding 60 percent of GDP, bringing the deficit below 3 percent of GDP would not be sufficient for lifting the excessive deficit procedure if the additional criterion of a declining debt ratio is not satisfied at the same time.

The Commission intends to take account of several additional parameters in the assessment of a sustainable debt level, such as the maturity structure and currency denomination of public debt, state guarantees, and implicit liabilities (e.g. future costs related to the ageing of society).

The Commission addresses the issue of future sanctions in great detail. It states, in general, that the breaching of rules could not be prevented in the past, and so sanctions need to be much more rule-based and applied on a case-by-case basis; in other words, a wider range of sanctions should be introduced. Another principle is to ensure that sanctions kick in at a much earlier stage, and it is necessary in their application to seek effectiveness and equal treatment

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[8] Before this document was prepared, the Commission had drawn up a similar material in early May; however, it was not ordered by the Van Rompuy Task Force.

between Member States. To ensure proportionality, financial sanctions would be defined as a percentage of the GDP of the relevant Member State (up to an identical upper limit for all Member States).

In the preventive stage – when a Member State is not making sufficient progress towards its medium-term budgetary objective – they would impose an interest-bearing deposit on euro area Member States and, applicable to all Member States, cohesion support would be disbursed pending on the implementation of structural and institutional reforms.

As regards the corrective stage – when the specific country is subject to an excessive deficit procedure – the Commission proposes a new system of financial sanctions. In essence, this would deploy the EU budget to enforce compliance with the rules set forth in the SGP. Sanctions should not affect items directly transferred to individual beneficiaries, but rather payment to Member States. On this basis, cohesion support or payments under the Common Agricultural Policy could be suspended or cancelled altogether.

Finally, the document provides technical details relating to the "European Semester" in light of its forthcoming adoption in 2011.

ADDITIONAL PROPOSALS

Several governments and institutions have commented on and added further proposals to the work undertaken by the TF. Since the opinions offered by different countries are generally not public and they are discussed within the Task Force (at the sherpa level), and since the work of the TF has not yet been concluded, we present below only two, high-

profile proposals: that of the ECB and the joint position of the French and the German government.

The Governing Council of the ECB released its own position on 10 June 2010 (ECB, 2010b). It set out proposals – in particular for the euro area – in three areas: strengthening surveillance over budgetary positions; an improved framework for competitiveness surveillance with a more efficient management of imbalances; and finally, establishment of a viable crisis management mechanism. According to the ECB, a quantum leap forward is needed in order to sufficiently reinforce the institutional foundations of the euro area. Among the details, two new items should be highlighted: in an attempt to tighten fiscal rules, the ECB would establish an independent, EU-level fiscal agency and propose that the suspension of voting rights be included in the spectrum of sanctions.

The joint German-French statement was issued on 21 July 2010, following the third meeting of the TF. As an introduction, they confirm their commitment to making the institutional framework of the economic policy more efficient, and they also agree on the three most important areas: revision of the preventive and corrective rules and setting up a crisis management mechanism. It is an important element of the joint position that they propose extremely stringent sanctions for Member States breaching the rules of the SGP: in addition to the suspension of payments from the Cohesion Fund – pending an appropriate legal basis – they also propose, similarly to the ECB, a suspension of voting rights for Member States that repeatedly fail to comply with the rules.

There is consensus about the need to have in place a crisis management framework that guarantees to minimise moral hazard. This can be achieved by ensuring from the outset

Table 1

Chronological order of the specific proposals

Date	Institution	Main proposals and novelties
26 March 2010	European Council (EC)	EU 2020 programme, setting up the Van Rompuy Task Force
10 May 2010	Ecofin	A common European rescue package and a firm commitment to sound fiscal policy
21 May 2010	Van Rompuy Task Force	Identifies the 4 main areas to be reformed: fiscal discipline; competitiveness surveillance; crisis management mechanism; more efficient coordination
7 June 2010	Van Rompuy Task Force	Presents detailed proposals relating to budgetary and macroeconomic balance
10 June 2010	ECB	Urges very resolute measures; independent fiscal agency, tough sanctions
17 June 2010	European Council (EC)	Supports the approaches of the TF theretofore; commitment to improved coordination
30 June 2010	European Commission	Presents specific proposals about several issues (e.g. European Semester, sanctions, macroeconomic imbalances)
12 July 2010	Van Rompuy Task Force	Focuses on the sustainability of debt; works out the stages of macroeconomic surveillance
21 July 2010	Joint proposal issued by the French-German governments	Strict sanctions against Member States in breach of the rules
6 September 2010	Van Rompuy Task Force	Presents budget surveillance and macroeconomic surveillance; a detailed overview of sanctions

that receiving assistance from the Union is tied to the fulfilment of stringent conditions. Nevertheless, it should be noted that, despite months of work, the markets do not have confidence in an efficient future crisis management. This is confirmed by the fact that, by mid-September, the risk premia of several euro area Member States reached or approached the levels observed in early May.

Table 1 provides a chronological summary of the proposals discussed above.

While the purpose of this article was to present, predominantly from an economic perspective, the proposals being forged, we should also stress the special role of legal considerations. There was a conscious effort to formulate all presented proposals in such a way, that their adoption would merely require the revision of secondary legislation without a need to revise the Treaty. Therefore, only the proposals not contradicting the provisions of the Treaty stand a real chance to become enacted regulations.

We should also touch upon equal treatment, a heavily discussed issue in the EU. On the one hand, in working out the proposals, several specific references have been made to this principle; e.g., when the Commission expressed its intention to set up a GDP-proportionate upper limit for the sanctions. On the other hand, as regards equal treatment, the logic applied by economics helps to avoid a situation where an apple has to be compared to a pear. On occasion of the previous reform of the SGP, Gábor Orbán and György Szapáry (2004) drew attention to the economic considerations concerning equal treatment: "In many documents and declarations reference is made to the 'equal treatment' of members when talking about the uniform application of the provisions of the SGP. Equal treatment in an economic sense would mean that one differentiates according to initial conditions and future liabilities...". Indeed, in an economic sense, equal treatment would only prevail if a more indebted country would have to pursue a tighter fiscal policy than countries with a more favourable initial position and lower debt level.

CONCLUSIONS

In summing up the presented proposals, we should emphasise that the European Council will only make a final decision October; at this point, we only talk about drafts. Nevertheless, the main directions of the changes can already be foreseen with a reasonable certainty.

Decision-makers are determined to adopt economic policy coordination mechanisms far more efficient than the existing ones. Accordingly, they will rigorously assess both fiscal and real economic imbalances, and after the imbalances have been identified, they will waste no time enforcing corrective mechanisms, including sanctions more severe than those in place. Rules governing crisis management will be certainly clearer; however, in order to minimise moral hazard, the common European rescue package will continue to come with a large price tag.

It is a warning sign, however, that despite firm policy intention, markets remain rather sceptical about the reform of the fiscal framework and the ability to guarantee the sustainability of fiscal policies, as indicated by the sovereign credit risk premia, which by September rose to the levels observed in May.

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Gábor P. Kiss and Zoltán Reppa: Quo vadis, deficit? How high the tax level will be when the economic cycle reverses?

The economic recession dampened tax revenues, causing deterioration – partly temporary, partly permanent – in the general government balance. The fiscal position can be assessed realistically if we can determine the level of revenue and deficit in the medium run. In order to do this, we prepare estimates of the trends of the macroeconomic variables determining tax bases and of the elasticity between tax revenues and tax bases. Trends in macroeconomic variables can be determined in three ways. Results from the macroeconometric model are more reliable and consistent. The simple time series method (ECB) is acceptable if it relies on prior estimation – e.g. one derived from the model – of the trends of macroeconomic variables. The Multivariate Hodrick-Prescott filter method (MVHP) only requires exogenously given potential GDP, and is thus suitable for simulation and for determining the uncertainty surrounding the estimate. Our model-based results show that the deficit for 2010 would be 2.8% lower if – over the medium term – there were convergence with the potential GDP forecast by the model. From 2011 this negative cyclical component will diminish by an annual 0.4-0.5%. If potential GDP is 1% lower, from 2011 tax revenues would approach a lower medium-term tax level 0.28-0.29% faster based on the MVHP method. If potential GDP is 1% higher, convergence to a higher tax level would be 0.30-0.31% slower.

INTRODUCTION

The majority of tax and contribution revenues decreased nominally in Hungary in 2009, with slight growth only in the areas (VAT and excise duty) where substantial tax hikes were introduced. This unprecedented tax shortfall was a consequence of the economic crisis and the fall in GDP. For the most part, this downturn was temporary, but it may also have permanent effects in some European countries. This means that in the medium term, both GDP and tax revenues will return to higher, although not necessarily pre-crisis levels. If we can estimate what level of GDP can be achieved, then we can determine the level of tax revenues in the medium term using the method of cyclical adjustment.

Due to the cyclical downturn, tax revenue is currently temporarily lower and ceteris paribus, the deficit is higher. The fiscal position can therefore only be assessed realistically if we can determine the value of revenue and the deficit in the medium run, once the trend of the economic growth becomes a more important factor than cyclical fluctuation. The result of cyclical adjustment, however, provides no information about how fast tax revenues will return to the trend value, as this can only be achieved by forecasting the developments of the main tax bases.

Cyclical adjustment deals with the general government items that are directly affected by developments in the economy, which are typically on the revenue side. In order to calculate the underlying (so-called structural) deficit, it is important to differentiate between the effects of temporary and permanent factors even in case of expenditures independent of economic performance. We will examine the latter in a later article.

Estimates of the cyclical effects on the budget were reported on several occasions in the MNB's regular publications over the past decade, for instance in Annual Reports (1999 and 2000), Reports on Convergence (November 2005 and May 2010) and Reports on Inflation (from November 2008 onwards). The method of cyclical adjustment varied, however. In the Annual Reports, we applied the method of the so-called Dutch indicator (P. Kiss, 1999), while in the 2005 Report on Convergence, we used our own approach (P. Kiss–Vadas, 2004). Since 2008 a new method of cyclical adjustment has been introduced, which has not been presented so far. In the following section, this new approach will be described, comparing the results achieved with various other methods.

In the following parts of this article, we examine the three main steps of cyclical adjustment. First, we determine the cyclical position of macroeconomic variables that can be considered as major tax bases. We then review which budgetary items (taxes) depend on the main macroeconomic variables (tax bases). As a third step, we quantify the

elasticity between taxes and tax bases. Finally, we compare the results achieved with the various methods, determined as the product of these three factors.

CYCLICAL DEVELOPMENTS IN MACROECONOMIC VARIABLES

In this article, 'cycle' refers to the cycle of the private sector; therefore, similarly to the ECB's approach, GDP, private sector per capita wages, private sector employment, unemployment, the household consumption expenditure and private sector gross operating surplus are taken as the basis (Bouthevillain et al., 2001).

According to the simplest (so-called aggregate) approach, it is enough to examine the cyclical gap of GDP (output gap) and derive the cyclical components of the other macroeconomic variable with the help of constant elasticity. In practice, however, the extent of cyclical fluctuation differs amongst the different variables, and cyclical components can even be of opposing sign compared to the output gap. The reason behind this difference is that the effect of various types of macroeconomic shocks varies; for instance falls in domestic demand (consumption) and external demand (export) have different effects on macroeconomic variables. Decreases can be permanent: that is, they may affect not only the cyclical component, but the trend as well. For instance, following the collapse of Comecon, Hungarian export to Eastern Europe experienced a permanent decline in 1991, immediately followed by a decline in firms' operating surplus. Wages and consumption, however, only adjusted following the consolidation programme in 1995–96. As our macroeconomic time series are short, such substantial shifts render the distinction between trends and the cycle more difficult.[1] It is not enough, therefore, to estimate the output gap in order to determine cyclical components; the other macroeconomic variables must also be examined separately. This is called a disaggregate approach.

Disaggregate methods differ from the perspective of whether the cyclical gaps of individual macroeconomic variables are estimated separately (Bouthevillain et al., 2001) or simultaneously using various methods or models (P. Kiss–Vadas, 2004, 2006, 2007). Consistency between trends is required since the weighted average of the cyclical gaps of wages and corporate operating surplus should be identical to the output gap. Furthermore, wage and consumption trends are also correlated.[2]

The most consistent solution captures these correlations using a macroeconomic model. All models include an output gap, generally estimated based on the production function. As the cyclical gaps of the other variables are not given, they must be determined based on the model. The MNB has followed this approach since the February 2009 Report on Inflation. This method is based on the fact that the trends of the variables are derived from the long-term relationship of the structural macroeconometric model. The cyclical gap of the variables is the percentage (point) difference between their current and their long-term trend values.

The earlier MNB method, called MVHP (P. Kiss–Vadas, 2007), also aimed for consistency. To achieve this, it links the output gap estimated using the production function and the other cyclical gaps with the so-called multi variate Hodrick–Prescott (HP) filter. It takes the output gap, containing information on how far the economy's current performance is from its potential performance, as a first step. Then, for the other macroeconomic variables, trends and cycles are separated with an HP filter. It is important to note that the HP filter assumes that the time series contains full cycles, thus the separation of the trend and the cycle can only be accurate if this criteria is fulfilled. As information regarding the cyclical position – the output gap – is already given in the first step, simultaneous filtering of time series allows the estimation of the multi-HP filter to be accurate even if the time series do not contain entire cycles. Simultaneous filtering ensures that the identity between potential GDP and the sum of the trend of private operating surplus and the wage bill is guaranteed. Consequently, the output gap is also equal to the weighted average of the operating profit and wage gaps. The MVHP filter also allows the trends and cycles of the wage bill and household consumption to be consistent.

The separation of the trend and the cycle using HP filters can, of course, be done individually for each variable. The prerequisite for this solution, used by the ECB, is that in order to achieve more accurate separation, the actual data should be extended by a forecast period of several years so that filtering can be applied to entire cycles (Bouthevillain et al., 2001). This, however, means that in order to perform this extension, there has to be a prior idea of how the cycle will close. From this perspective, it is more transparent if instead of extension, we explicitly rely on the output gap

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[1] Comparable statistical time series are available from 1991 on an annual basis, and from 1995 on a quarterly basis. Accordingly, the quarterly macroeconomic model can only be prepared for dates after 1995.

[2] Nominal GDP less indirect taxes is equal to GDP at factor cost, which is identical to the sum of wages and gross operating surplus. If we deduct general government wages and operating surplus, we obtain the private wage and operating surplus category.

Chart 1

The output gap and the cycle of private sector employment
(as a percentage of GDP)
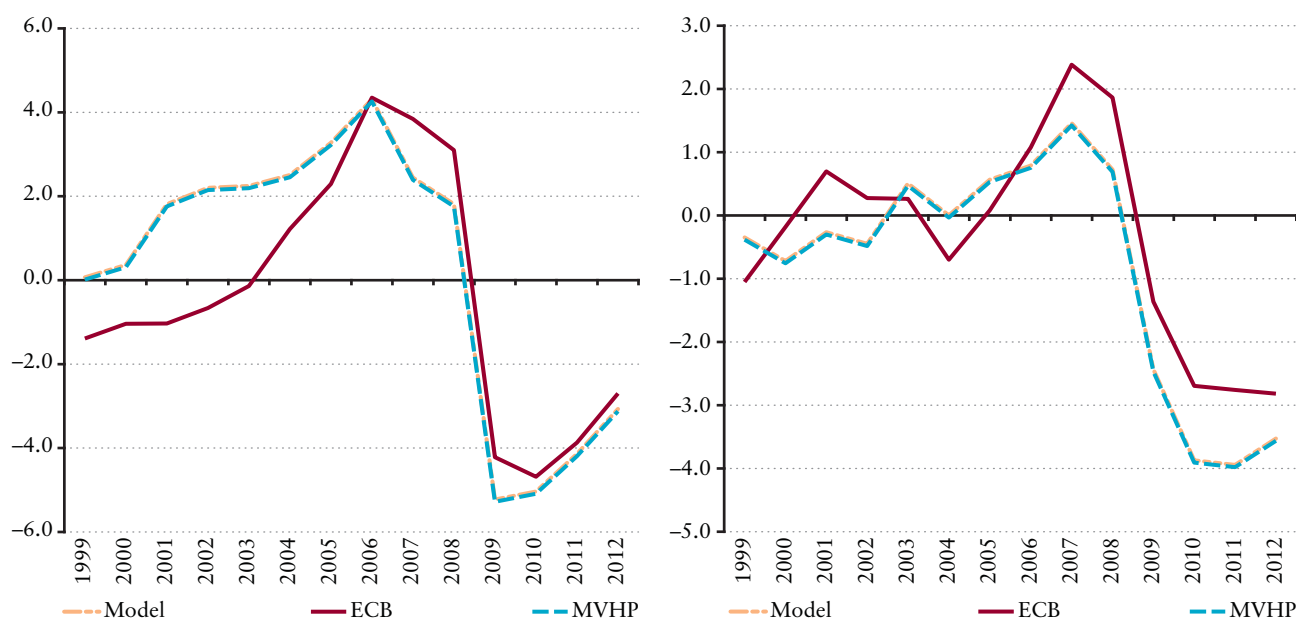
estimated prior to HP filtering. Chart 1 shows that HP filtering cannot, despite the extension, produce similar results to the output gap estimated based on the production function (found in the model and the MVHP approach), amongst others because the 1990–91 period is not included in the time series, therefore the partly cyclical, partly permanent decline is omitted from filtering.[3]

We would like to note that regarding the future trend of potential GDP and employment, the model and MVHP use the same expert estimate as the basis. The original method of MVHP only took potential GDP as exogenously given, while private sector employment was filtered like the other variables. MVHP, however, failed to adequately estimate the current strong cyclical shifts in respect of employment, and so according to the new approach, the trend thereof is also considered as given. This renders the use of MVHP for simulations somewhat more difficult, as previously only one parameter, potential GDP, had to be changed for this. Chart 1 also shows that the cyclical component of employment – unsurprisingly – co-varies with the output gap, in other words changing potential GDP remains sufficient for simulation purpose.

Besides the fact that – even with the best extension in time – the HP filter cannot approximate the results achieved with the model, the HP filter cannot ensure consistency between

the separately estimated trends. The "gross operating surplus plus wage equals GDP" identity is often not fulfilled in the case of trends and cycles, for example (P. Kiss-Vadas, 2007). According to our current calculations, this distortion varies between ±1.5 percent of GDP (Chart 2), which may distort the cyclically adjusted budget balance by ±0.5 percent depending on the tax content.

This inconsistency partially explains why the patterns of the cyclical gaps obtained using the model and MVHP are more

Chart 2

Deviation from GDP identity in the case of individual HP filter
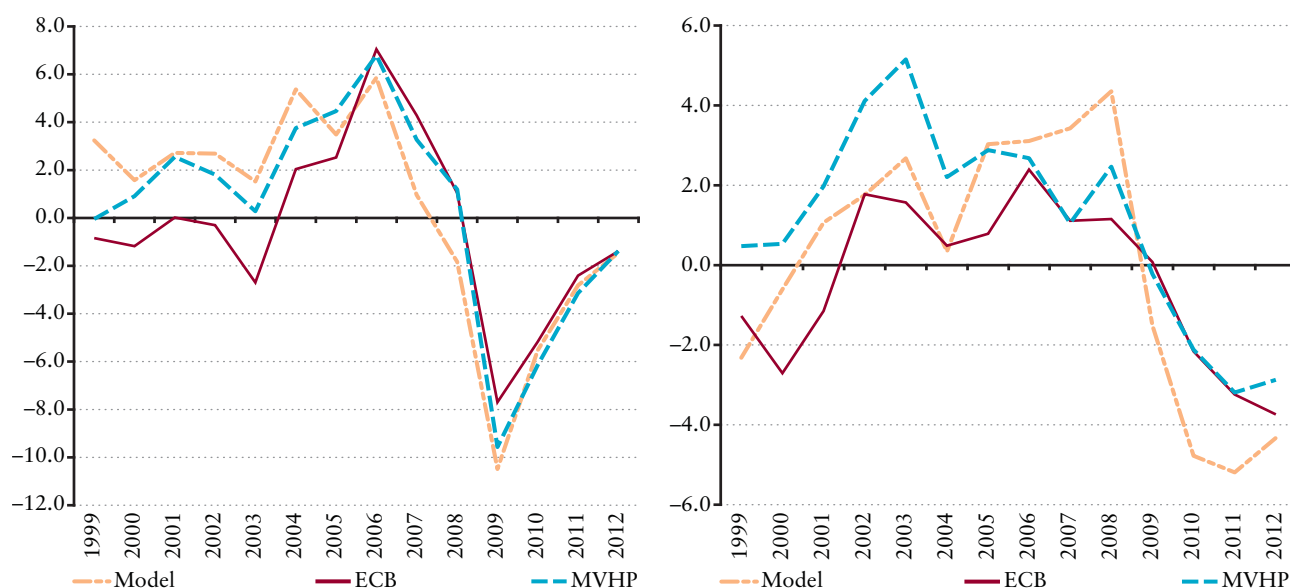*(as a percentage of GDP)*

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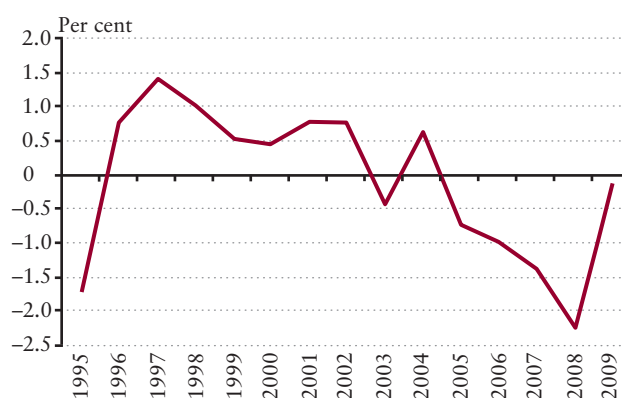
[3] In the following, the filtering of cyclical components is consistent with the August 2010 *Report on Inflation*.

Chart 3

Cyclical gaps of average private wages and operating surplus
(as a percentage of GDP)

similar than the cyclical adjustment prepared with the HP filter. It is important to note that from the perspective of the result, it is not so much the sum of the cyclical gaps of wages and operating surplus but rather their composition that is determining, because – from the perspective of tax revenues – wages are the most important factors (see Chart 5). If we compare the results of the model and MVHP, similarity is more evident in the case of operating surplus, while in the case of the wage gap, their patterns are similar (see Chart 3). As the MVHP indicates a smaller deterioration for 2009-

2012, the smaller wage gap contributes to a less negative cyclical component.

In addition to the cycle in average wages, the cyclical component of the wage bill also depends on the cycle of employment. As mentioned above, this is identical in the case of the model and the MVHP. The result of HP filtering (Chart 1) shows very similar dynamics, but with a narrower negative gap in 2010–12. As the wage bill is the main determinant of cyclical tax revenues, it contributes

Chart 4

Cyclical gaps of unemployment and household consumption
(as a percentage of GDP)
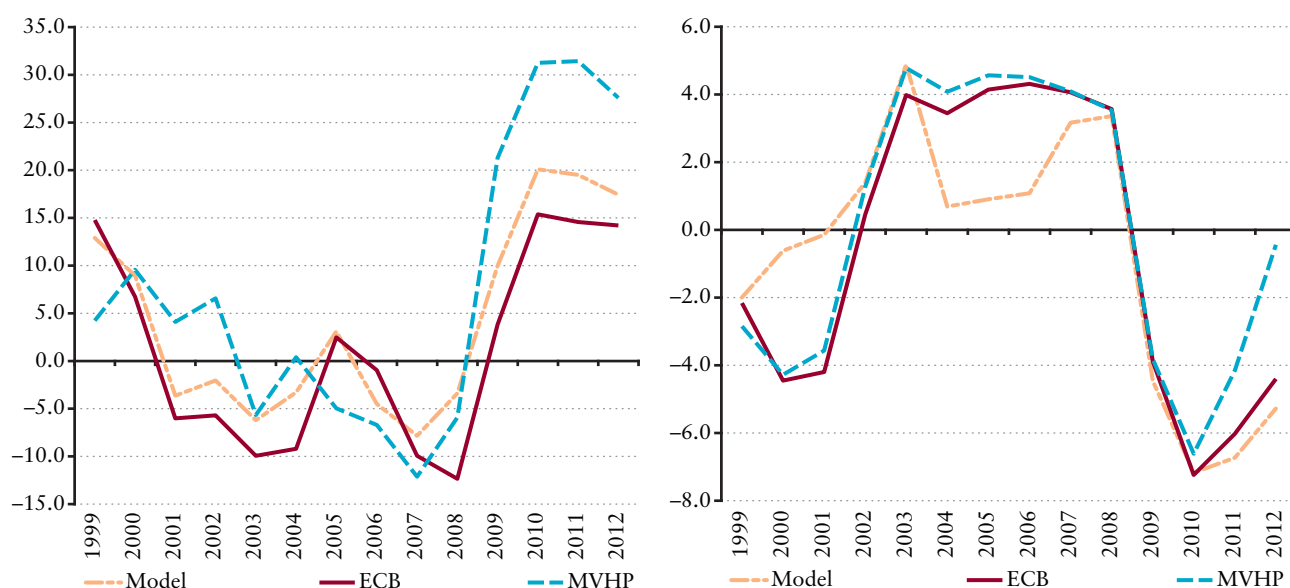
significantly to the fact that HP filtering estimates a smaller negative cyclical component.

The cyclical gap of employment is obviously also correlated with the cyclical gap of unemployment. In this case, despite the same employment gap, the model and the MVHP yield different estimates. The cyclical gap of unemployment is usually much higher than the gap of employment, but the different estimates in this case show the similar patterns of the cyclical gaps (Chart 4).

The wage bill is not only the largest tax base, but has an effect on the second largest tax base, consumption. This correlation, however, is not automatic in case of the HP filter, and can only be captured in case of very long time series at the best. From 2008 onwards, the HP filter yields a consumption gap similar to the model, but this is not the case for the components of the wage bill: here the HP filter gives a cyclical gap that is not consistent with the consumption gap. On the other hand, the MVHP method links the trends of wages and consumption, albeit in a simpler manner than the model. In this case, consistency with the wage bill is achieved, but the model results cannot be approximated by MVHP's estimates due to the particular properties of the crisis. One reason for this, for instance, is that the sharp increase in unemployment has changed consumer behaviour, and consumption from credit has also fallen. The drop in consumption was perceived as less cyclical by the MVHP method, partly qualifying it instead as a decreasing trend, thus nearly closing the negative gap by 2012 by approaching this lower trend.

THE COVERAGE OF BUDGETARY ITEMS TO BE CYCLICALLY ADJUSTED

Budgetary items can be separated on the one hand into (discretionary) items exclusively defined by fiscal policy, and on the other hand into items jointly determined by one fiscal parameter (e.g. tax rate) and exogenous developments (e.g. cycle). The first group includes the expenditures nominally fixed by annual budgetary law, while the second consists of tax revenues, unemployment benefits and expenditures indexed to real variables, such as pensions.

If we try to find out the actual size of budgetary items determined by the economic cycle, we must exclude the tax content of general government expenditures constituting a tax base, as this part does not have a direct correlation to the cycle (Bouthevillain et al., 2001; P. Kiss and Vadas, 2004). By filtering out taxes paid within the general

government, we not only obtain a better picture of cyclical tax revenues, but also of the expenditure-side effects of the cycle, as this affect the deficit net of taxes. Regarding the tax content of government expenditures, we used the results from a study (P. Kiss et al., 2009), and actual data for the social security contributions paid by the government as an employer. Thus, similarly to the ECB's method – and contrary to the practice of other international organisations – we focused on private proportions of tax revenues, which are roughly 80 percent of the total.
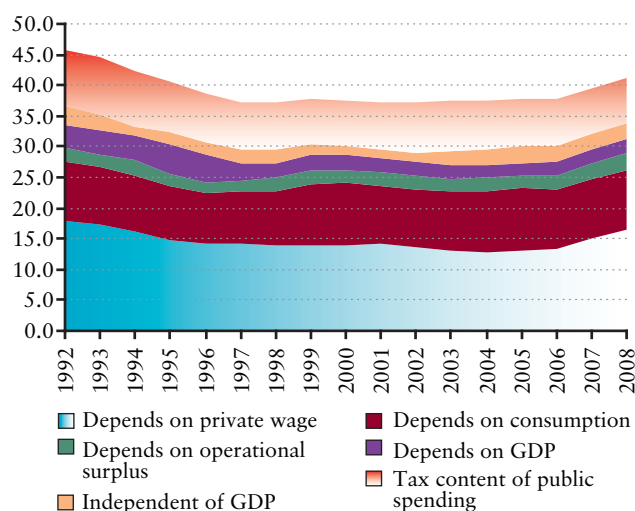
Among expenditures, those that are related to unemployment clearly depend on the economic cycle, as the cycle affects the developments of employment. These expenditure items include unemployment benefits, income support for the medium-term unemployed and early retirement pension payments. We did not take into account the contribution paid on unemployment benefits, nor the regular social benefit for the long-term unemployed gradually replacing income support.[4]

Pension expenditure depends on developments in wages in the years where the wage index affects the annual increase of individual pensions. We included old-age and survivor's pensions, as well as disability pensions both below and above retirement age. The primary source for both pensions and unemployment data is the Central Statistical Office, complemented by the budgetary data from the Budget Execution Laws in some cases.

Chart 5

Taxes included in and excluded from cyclical adjustment
(as a percentage of GDP)

Legend:
- Depends on private wage
- Depends on operational surplus
- Independent of GDP
- Depends on consumption
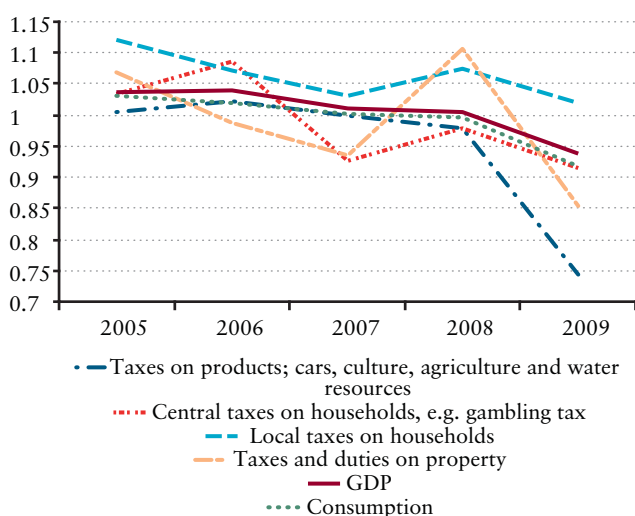- Depends on GDP
- Tax content of public spending

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[4] The other forms of support are temporary (early retirement pension transforms into old-age pension), whereas regular social support for the long-term unemployed is more permanent and does not necessarily decrease once the cycle reverses.

In case of tax revenues, we used data from the Budget Execution Laws and treasury reports. These cash-flow payments were adjusted in case of VAT in order to smooth out fluctuations in refunds.[5] Below we list the various taxes and contributions, grouped based on the macroeconomic variable they correlated with (Chart 5).

– Developments in wages have effects on personal income tax revenue, as well as contributions paid to the Labour Market Fund and Social Security Funds both by employers and employees. We deducted tax and contributions paid on government expenditure (wages, social benefits) from these.

– Household consumption expenditure affects developments in VAT, excise duties and car registration tax. We also adjusted these by the tax content of government purchases.

– Corporate tax, special tax and tax on banks depend on firms' operating surplus.[6]

– Local business tax levied on the value added of the private sector, may be more closely correlated to economic growth, while customs revenue, collected on import, and the simplified entrepreneurial tax (EVA), paid on gross sales revenue, less closely correlated to it.

– Developments in minor household taxes (e.g. gambling tax), and production taxes have less obvious links to the main macroeconomic variables. As they do not follow

Chart 6

Minor taxes, household consumption and the GDP at volume index

- – Taxes on products; cars, culture, agriculture and water resources
- ..... Central taxes on households, e.g. gambling tax
- – – Local taxes on households
- – – Taxes and duties on property
- —— GDP
- ..... Consumption

either consumption or GDP (Chart 6), and their relative size is insignificant, they can be excluded from cyclical adjustment, similarly to the tax content of government expenditures. P. Kiss and Vadas followed this approach (Közgazdasági Szemle, 2005).

ELASTICITY BETWEEN BUDGETARY ITEMS AND MACROECONOMIC VARIABLES

In the previous sections, we prepared estimates of the trends and cycles of macroeconomic variables, and identified expenditures and revenues linked to developments in these variables. As a final step, we must quantify the elasticity between the budgetary items and their corresponding macroeconomic variables. Elasticity refers to the percentage change in the budgetary item caused by a one percent change in the macroeconomic variable. In order to determine this, international practice has three approaches.

– Hypothetical elasticity can be determined based on effective tax and indexation rules. The OECD, for example, calculates average and marginal rates for direct household taxes and social security contributions, adjusted by certain tax allowances, for various income levels. The elasticity of revenues with respect to gross wages is calculated as a ratio of the weighted average of the marginal and average rates. This shows the additional tax paid by taxpayers if their income increases by one unit.

– Elasticity between the budgetary and macroeconomic time series can also be estimated. For short time series, however, an accurate result can only be achieved if the effect of discretionary measures (tax increases or tax cuts) can be filtered out from the budgetary time series. For this reason, this method is less widely applied.

– For the sake of simplicity, unit elasticity is often assumed between taxes and tax bases, and unemployment benefit and unemployment. The illustration provided by P. Kiss and Vadas (2006) showed that this is a realistic assumption if the tax and welfare system are relatively simple and the cycle's effect is symmetrical. In the following section, we illustrate that this is not the case for corporate tax.

In international practice, elasticities thus determined are fixed for each period, and updated or recalculated every few years. In our case, the majority of elasticities are stable, but using time-varying elasticities instead of constants yields a

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[5] The reason behind this is the one-off effect of EU accession and the discretionary timing of refunds.

[6] The surcharge on the financial sector from 2010 is a payment tied to an earlier balance sheet total, which is thus independent of developments in macroeconomic processes.

Table 1

Elasticity of cyclically adjusted items

			1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Pensions	private average wage	t	0.68	0.68	0.68	0.68	0.00	0.00	0.00	0.00	0.53	0.38	0.37	0.36	0.36	0.36	0.37	0.37	0.37	0.00	0.00
		t−1	0.00	0.00	0.00	0.00	0.68	0.68	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unemployment related spending	number of unemployed	t	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Personal income tax	private average wage	t	1.76	1.69	1.70	1.75	1.72	1.50	1.54	1.48	1.43	1.40	1.55	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56
	number of employed (private)	t	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Contributions	private average wage	t	1.00	1.00	1.00	1.00	1.00	0.94	0.94	0.91	0.91	0.92	0.92	0.94	0.95	0.96	0.98	0.98	0.98	0.98	1.00
	number of employed (private)	t	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Consumption related taxes	household consumption expenditure	t	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.20	1.21
Local business tax, simplified tax, costums duties	GDP	t	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.50
Corporate income tax	private gross operating surplus	t	0.20	0.20	0.20	0.20	0.20	2.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
			1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.10	1.50	1.50	1.50	1.50	1.50	8.00	1.50	1.50

better result in some cases, as illustrated by the numerical examples provided by P. Kiss and Vadas (2006) and our recent experience. According to this, the extraordinary changes that occurred during the crisis enhance the cross-checking role of elasticities (see VAT below).

The elasticities are determined as follows:

– Indexation of pensions depends on the per capita wage index (and inflation). In our case, cyclical adjustment only applies to private sector wages, and therefore adjustment by the share of the private sector must be carried out within the wage bill. Until 1995, pensions fully followed the wage index of the current year, and that of the previous year in 1996–1998. In 1999, indexation was temporarily suspended. In 2000–2008, pensions were indexed to a weighted average of the current wage growth and inflation; the weight of wage index was 70% in 2000,

and 50% in 2001–2008. As of 2009, the weight of wages depends on GDP growth applying some thresholds.

– We assume unit elasticity between the unemployment benefit and the number of unemployed, although the cyclical effect is not necessarily symmetrical[7].

– In case of personal income tax revenue, the calculation is made based on the tax table and income distribution. We determined the elasticity as the ratio between marginal and average tax burdens calculated by Révész–Newbery (2000) for 1992–1998.[8] The distribution of taxable income and the average tax burden by income group between 2000 and 2003 is available, so we only had to make an estimate of the "effective" marginal rates.[9] For 1999, due to a lack of available data, we took the average of 1998 and 2000, while we assume constant elasticity from 2004 onwards.

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[7] This means that the decline in employment immediately affects unemployment benefits, but not necessarily a later recovery. On the one hand, in the past, the unemployed applying for early retirement pensions did not return to work, and on the other hand, the gradual shortening of the entitlement period of unemployed benefits means that the unemployed often left the welfare system even before a later cyclical recovery. The effect of this, however, cannot be separated from the continuous tightening of conditions and developments in unemployment, and therefore elasticity cannot be estimated.

[8] The average and marginal personal income tax burden on the lower, middle and upper income groups defined based on household income surveys was calculated. In order to take into account tax allowances, two children were assumed for both the lower and middle quintile, while no child was assumed for the upper quintile.

[9] In our calculation, we focused on wages. We calculated marginal rates for each wage level, deducting the (1) personal income tax allowance paid into private pension funds, which is proportionate to a certain income ceiling, (2) tax allowances for employees that gradually phase out for higher income levels, (3) tax allowance on pension income until 2001, which income is indexed to wages and inflation and (4) family tax allowance stipulated by law.

– The elasticity of contributions is also calculated as the ratio between marginal and average burden. The average tax burden was given for the entire period. The main difference between average and marginal rate of contributions is the lump sum healthcare contribution paid by firms based on the number of employees.[10]

– In case of VAT, excise duty and car registration tax, we assume that one unit of consumption change results in a one-unit shift in revenue, as developments in VAT are shaped by so many factors that the role of consumption cannot realistically be separated from them.[11] The crisis also highlighted the importance of the fact that besides consumption, VAT is also affected by the building and elimination of inventory. Changes in inventory are cyclical, however, and are not examined separately. As a solution, for the elasticity between VAT and consumption, we take into account the estimated effect of the fall in consumption in 2009 being partially offset by the decrease of inventories. This mitigated the negative effect on VAT because sales from inventory yielded only revenue, but no refunds, as they had been refunded previously, when inventories were accumulated (February 2009 Report on Inflation). The reversal of this effect may take place in 2010-2011, which would increase the elasticity between VAT and consumption above one.

– We also assumed unit elasticity in case of local business tax, simplified entrepreneurial tax (EVA), and customs revenues. The effect of tax measures cannot be separated from changes in tax bases in case of these items either, and the tax bases themselves can only be indirectly affected by the developments in GDP. Local business tax shifted gradually (in 1998–2000) from gross sales revenue based tax to value added based production tax, although its base remains broader than private GDP. Simplified Entrepreneurial Tax (EVA), introduced in 2003, is also a gross sales tax, so similarly to the customs revenue (in place until 2004), it is only indirectly linked to GDP. In case of these revenues, assuming unit elasticity seemed appropriate, except in case of local business tax for 2010, when revenue forecast based on mid-year data suggested an elasticity of 1.5.

– The tax base for corporate tax is corporate profit, which in principle depends on one of the components of GDP, gross corporate operating surplus. In practice, however, they are not closely correlated. First of all, the category of net operating surplus excluding the depreciation of corporate fixed assets is closer to the definition of profit. Furthermore, tax revenue is determined by the payments of profitable firms, as the losses incurred in a given year only affect the subsequent period, since firms carry-forward their losses, paying less taxes in the future. The tax base, however, can be adjusted by including the profit of profitable firms and the loss of loss-making companies, thus consistently excluding losses carried over from previous years.[12] The dynamics of this adjusted tax base, however, differ from that of the gross and net operating surplus, but the link between them can be achieved with elasticity to year t-1. This constant elasticity estimated by us does not seem appropriate in three specific years, so for these years, we determined special elasticities based on the actual dynamics (see Table 1). The Chart below shows gross operating surplus, nominal changes in the adjusted

Chart 7

Adjusted corporate tax base, operating surplus and tax base calculated with elasticity
(nominal change, per cent)

Legend:
— Adjusted tax base
⋯⋯ With elasticity on operational surplus
– – Gross operational surplus

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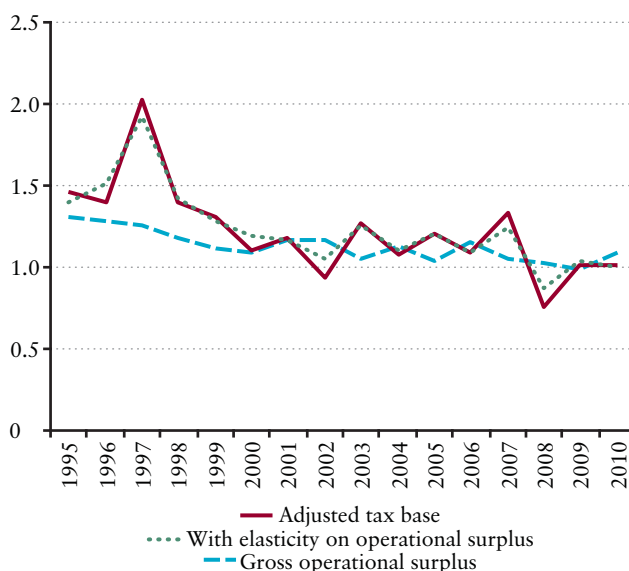
[10] A much slighter difference, insignificant from 2004 onwards, is the nominally fixed ceiling on some contributions paid by employees. We calculated the weight of incomes falling within the 1 percent band surrounding this ceiling based on the income distribution used for personal income tax calculations, as in case of a 1 percent shift, the burden on incomes which are smaller than the upper threshold by more than 1 percent.

[11] We adjusted VAT revenue on a cash-flow basis with the effects of EU accession and the timing shifts in refunds, but only estimates are available. Not only tax measures but tax evasion affected the developments in tax revenue and these effects can be hardly separated.

[12] The effect of carry-forward losses would be difficult to determine, and must be partially estimated (P. Kiss et al., 2009). Based on this, firms can use the smaller portion of the losses incurred in the year under review – one third according to recent estimates – to offset future profit. The remaining losses therefore "disappear", with some firms going bankrupt. Therefore profit, even adjusted by one third of losses, is still not fully in line with net operating surplus; in other words the profit/loss composition still has a distortive effect.

tax base, as well as the dynamics of the tax base calculated with elasticity. It is apparent that the elasticity to year t-1 replicate the patterns in the adjusted tax base, in other words a link between the cyclical gaps of the two categories is established. Possible reasons for this time lag are that the tax base is deviated from operating surplus by the changing composition between profits and losses (we adjusted by one third of this effect), tax credits reducing the tax base and depreciation costs.[13]

CONCLUSIONS

In this article we presented how the budgetary items affected by the main macroeconomic variables are determined. We also examined how the elasticity between budgetary items and macroeconomic variables can be quantified. One problem is that the definition of the macroeconomic variables and actual tax bases differ, for instance it is possible to carry-forward losses in the case of corporate tax. Updating elasticities can help in examining whether the annual dynamics of tax revenues can properly be explained by the estimated effects of the cycle and discretionary measures.

Regarding the estimation of the cyclical gaps of macroeconomic variables, the article presented the results of three disaggregated methods, all characterised by the fact that besides the aggregate output gap, they take into account the trend and cycle of the macroeconomic variables determining the main tax bases. This is necessary because the composition of GDP (wages and operating surplus) can be the most important factor, besides the output gap, in determining the size of the cyclical component of the general government deficit.

The model-based method gives the best estimate of the cyclical position, as it is based on the output gap estimated with a production function approach, and thus separates the trend and the cycle in a consistent way for the other macroeconomic variable as well, including projected changes in trends (Chart 8). Based on this, the deficit for 2010 would be 2.8% lower if tax bases reach their future trend. From 2011 the negative cyclical component as a percent of GDP may decline by 0.4-0.5% per annum.

The HP method employed by the European Central Bank uses a simple HP filter instead of the output gap to separate the trend from the effects of the cycle. This method assumes that time series cover full cycles; therefore in the case of short time series like in Hungary, extension with a forecast period is necessary. This, however, requires prior knowledge

Chart 8

Cyclical component of the general government deficit
(as a percentage of GDP)

Model — ECB — MVHP
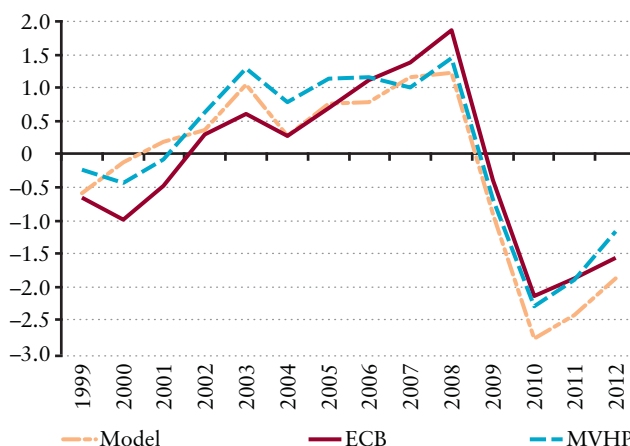
(derived from the model, for example) regarding the trends and cycles of the variables. We relied on model information in the course of extending the time series and tried to achieve a better fitting for the recent years. At the end this simple method was able to yield results for these years similar to those of the model, at the cost of obtaining a larger difference for the other years (Chart 8). Furthermore, as the filtering of variables is done separately, the results are often inconsistent, with the sum of the trends and cycles of wages and operating surplus not being identical to the trend and cycle of GDP, for example.

The MVHP method previously employed by the MNB uses the information contained in the output gap, and links the trends of individual macroeconomic variables. The crisis has revealed that besides the output gap, the employment gap should also be taken as an exogenous input. Another consequence of the crisis was that the connection between the wage bill and consumption trends shows the effect of consumer behaviour changing as a result of a partly permanent increase in unemployment, and a fall in credit-financed consumption. As a result, the MVHP method only yielded a result close to the HP filter for the cyclical component for the recent years, despite the consistency of the result; in other words it shows similar deviations compared to the model-based approach.

The MVHP method makes cyclical adjustment easy to replicate, and its advantage over the HP method is its consistency and that macroeconomic variables do not need to be extended to their full cycle. Therefore, this method can be used for simulation purposes and to determine the uncertainty surrounding the trends especially if changes in

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[13] Taxpayers have the opportunity, for example, to speed up depreciation write-offs is allowed by tax regulation.

trends are assumed. We saw that based on the trends derived from the model, the reduction of the negative cyclical component in 2011-2012 could be 0.5-0.6% annually.

Based on the simulation prepared with the MVHP method, in case of a 1% lower potential GDP for 2011–2012, the trend of tax-to-GDP level is lower than the baseline scenario, and the actual level will approach the trend faster (by 0.28-0.29%), reaching the trend level by 2013–2014. By contrast, if potential GDP is 1% higher, tax revenues would approach a higher trend level, but at a pace which is slower than in the baseline (by 0.30 and 0.31%). The slight asymmetry between the two results stems from the fact that the MVHP method divides potential GDP in somewhat different proportions into operating surplus and wage level, and the different tax burden on these tax bases results in a difference of 0.02% in the cyclical component.

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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

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

- - Sum of credit institutions' reserve requirements
—— Credit institutions' account balances (reserve maintenance)
- - Monthly average of reserve maintenance
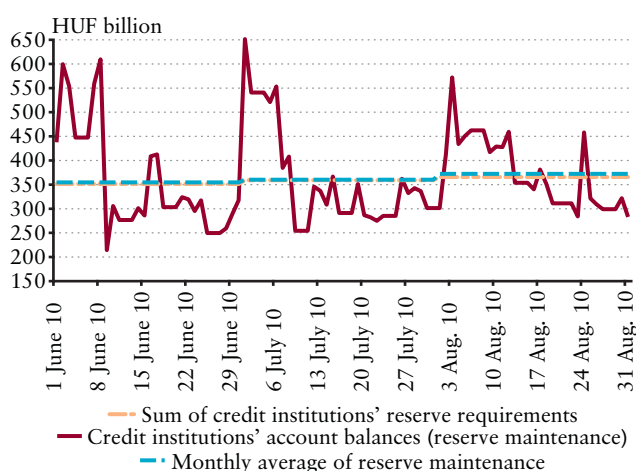
Source: MNB.

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 $1{,}000 \times (1/0.1) = 10{,}000$ 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.

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[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:
$1000 \times (1-r)$

Lending potential:
$[1000*(1-r)] \times (1-r) = 1000 \times (1-r)$

Lending potential:
$[1000*(1-r)^2] \times (1-r) = 1000 \times (1-r)^3$

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

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[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.
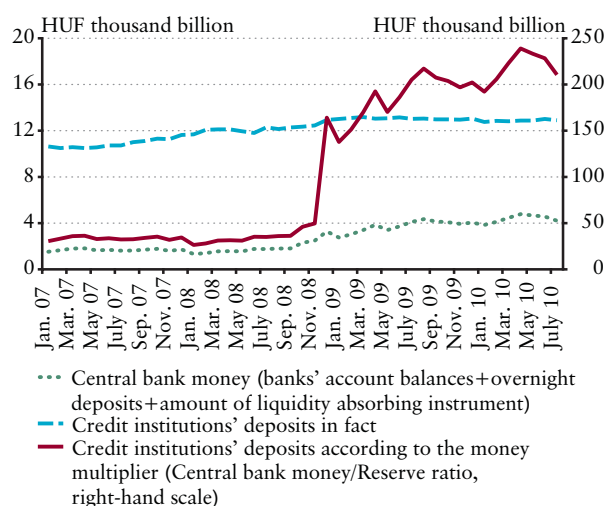
Chart 3 clearly illustrates that, according to the money multiplier model, the volume of commercial bank money, i.e. the sum of all commercial bank deposits, should have significantly exceeded the observed figures

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)

- Central bank money (banks' account balances+overnight deposits+amount of liquidity absorbing instrument)
- Credit institutions' deposits in fact
- Credit institutions' deposits according to the money multiplier (Central bank money/Reserve ratio, right-hand scale)

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

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[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

Chart 4

Fluctuation of credit institutions' account balances around the aggregate sum of reserve requirements
(September 2008–February 2009)
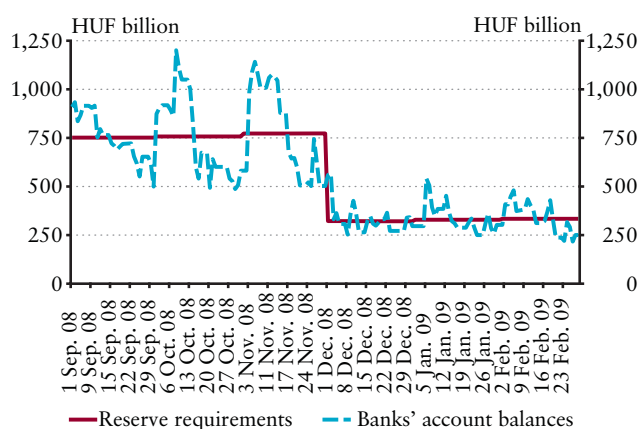
Source: MNB.

payment turnover, which had already pursued a relatively stressed liquidity management regime.

… 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

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[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
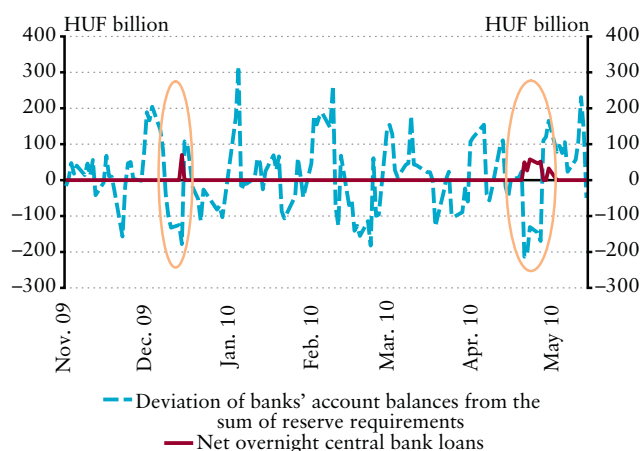
Source: MNB.

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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Appendix

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