The impact of public debt on foreign exchange reserves and central bank profitability: the case of Hungary

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Abstract

This paper focuses on the interactions between public debt policy and foreign exchange reserve management. We found that, although foreign currency debt issuance can contribute significantly to the growth of foreign exchange reserves, it can cause serious difficulties in the assessment of reserve adequacy, especially during crisis periods. Furthermore, it affects the profit-loss of the central bank. On the other hand, the accumulation of foreign exchange reserves may affect the public deficit and debt as well.

Based on these observations, we draw several lessons. We conclude that debt management policy may result in a suboptimal solution on a consolidated basis if the needs of reserve adequacy are not taken into account within the decision-making process for foreign currency debt issuance. In addition, we argue that, if the central bank wants to enhance its capacity to intervene during a crisis, it should seek to identify and utilise other sources of foreign exchange liquidity. But the options here are limited: we believe that the most appropriate tool that would enable a central bank such as the MNB to rapidly obtain an ample amount of foreign exchange reserves is a foreign exchange swap line provided by a developed country central bank.

Keywords: Monetary policy, fiscal policy, public debt management, national budget, sovereign debt, foreign exchange reserve

JEL classification: E52, E58, E62, E63, H63

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Introduction

Through various channels, the amount and structure of public debt can have a significant influence on a central bank's foreign exchange reserve management. On the one hand, the issuance of foreign currency-denominated debt can boost international reserves. On the other hand, repayment of public foreign currency debt not only reduces the level of foreign exchange reserves but can cause transient problems in liquidity management. Furthermore, the dynamics of public debt influences not only reserve accumulation but may affect the central bank's reserve adequacy targets, as an increased level of foreign debt can push up the reserves, requirement, depending mainly on the maturity structure of public assets held by non-residents.

The actual level of reserves may also set in motion forces that interact with public debt. Inadequate foreign exchange reserves would call for an increase in foreign currency debt or would lead to changes in market perception about the sustainability of the debt. Such changes would affect the fiscal deficit not only directly through interest costs, but indirectly through the central bank's profit and loss. The cost to the central bank of sterilising excess liquidity in the domestic money market is likely to increase, given that there is a significant spread between the cost of sterilisation and the yield on foreign exchange reserves.

This paper focuses on how public debt policy and foreign exchange reserve management have interacted in Hungary. The massive increase in the country's foreign currency debt and the changes in reserves in the past decade offer several important lessons. We describe how the central bank's room for manoeuvre in reserve accumulation can be constrained by debt and exchange rate considerations. We evaluate the most important components of such constraints. We also demonstrate how various state agencies may have diverging goals related to public debt, and how the potential conflict of interest between these goals can influence preferences that are reflected in the assessment of reserve adequacy.

The paper proceeds as follows: Section 2 outlines the development of foreign exchange-denominated public debt in Hungary. Section 3 investigates the effect of this increase on the international reserves. Section 4 examines the impact on reserves requirements while Section 5 describes the effects on the central bank's profit and loss. Section 6 summarises the most important policy lessons and Section 7 concludes.

The role of foreign currency-denominated debt in Hungary's public finances

There is an extensive literature on the benefits or desirability of foreign currency-denominated public debt. The most important potential benefits of foreign currency debt include access to a larger investor base, less crowding-out in domestic markets, lower yields on foreign exchange issuance, access to longer maturities, and the possibility of building up official foreign exchange reserves and improving short-term stability in hard times.

But foreign currency financing has risks. These include more stringent constraints on redeeming foreign currency debt relative to debt denominated in the domestic currency, which can increase the rollover risk. Also, large-scale foreign exchange issuance can increase the country's external vulnerability as perceived by investors and credit rating agencies. Finally, a significant depreciation of the domestic currency may significantly increase the interest burden as calculated in that currency.[2]

[2] Wolswijk and de Haan (2005) summarise the related literature, where empirical studies suggest that smaller economies tend to take on more foreign currency debt (Claessens et al (2003)), and the decision seems to be

In Hungary, the Debt Management Agency (ÁKK) incorporated these considerations into a quantitative model for cost/benefit and risk analysis. They used the model to construct a reference band for the foreign exchange share of public debt, at 25–32% of total government debt in 2004. This seemed to be a reasonable choice at Hungary's pre-crisis public debt level of 60–67% of GDP. Like many other emerging market economies, Hungary was short of domestic private savings to cover the government's large financing requirement. Thus, it was vital to attract foreign investors. Large-scale issues of foreign currency-denominated bonds were inevitable because investors were reluctant to purchase domestic currency government paper in the necessary amounts. According to ÁKK, the benefits of foreign debt would offset the additional costs and risks in the target range and the annual issuance of foreign currency debt was broadly in line with the central bank's foreign exchange reserve target.

Prior to the crisis, the actual share of foreign currency debt remained at the planned levels. However, the impact of the global turmoil in late 2008 enforced a radical change in debt management, and the actual share of foreign currency debt jumped to more than 40% of total debt. After the collapse of Lehman Brothers, the demand for HUF government bonds plummeted and AKK was forced to suspend primary issuances. Medium- and long-term HUF bond issuance was suspended between 22 October 2008 and 12 February 2009, when it was restarted on a smaller scale, returning to normal levels only around July 2009.

To cover its financing needs, the government, together with the central bank, requested an EU/IMF standby agreement in November 2008. The financing provided by this programme practically replaced the government's local currency financing with foreign exchange-denominated debt in 2009. The EUR 20 billion arrangement served three goals beyond supporting the financing of the balance of payments. It (i) helped to increase the foreign exchange reserves of the central bank; (ii) covered the government's financing needs; and (iii) it also played a substantial part in stabilising Hungary's financial system. The government drew down EUR 12.9 billion over the course of the programme, while the central bank withdrew an additional EUR 1.4 billion to replenish foreign exchange reserves without increasing the public debt.

The most direct consequence of the EU/IMF agreement was that gross government debt surged in 2008, in spite of the historically favourable deficit of 3.7% of GDP. As the drawdowns were front-loaded, and part of the tranches were deposited at the central bank, or were onlent to support domestic financial institutions, gross debt increased by more than the government's financing needs.[3]

At the same time the foreign exchange share of public debt exceeded its ceiling, reaching 44.7% by the end of 2009. This radical change was clearly due to practical considerations, and was not preceded by the overhaul of the debt management strategy. However, the sudden increase in foreign exchange debt had a substantial impact on interest expenditure, short-term external debt, foreign exchange reserves, the central bank's profit and loss, and the structural liquidity surplus on the interbank money market, as presented in the following sections.

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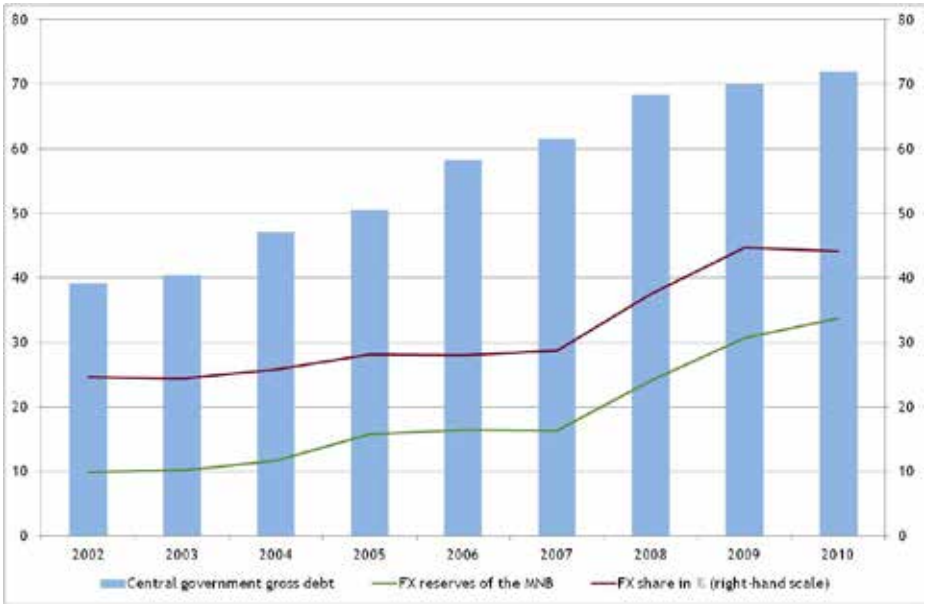
motivated mainly by practical considerations especially the expected cost of foreign currency debt (Pecchi and Di Meana (1998)).

[3] The front-loaded pattern of the loans only slightly affected the medium-term level of debt, because the excess withdrawals were gradually used for government financing at a later stage. Thus the debt converged to a level derivable from a smoother theoretical debt issuance schedule.

Graph 1

Central government debt and foreign exchange reserves

In billions of euros



The effect of foreign currency-denominated public debt on foreign reserve dynamics

The financial crisis caused significant changes in the structure of the Hungarian foreign exchange reserves. Before the crisis, reserve levels increased only slowly in line with the country's short-term debt dynamics. The authorities preferred not to hold any buffer above this precautionary level. However, after the crisis deepened, the level of international reserves doubled in three years. This section describes how the increase of foreign currency debt contributed to this process and what kind of side effects and constraints arose in the management of foreign exchange reserves.

Foreign currency debt issuance can contribute significantly to the growth of foreign exchange reserves

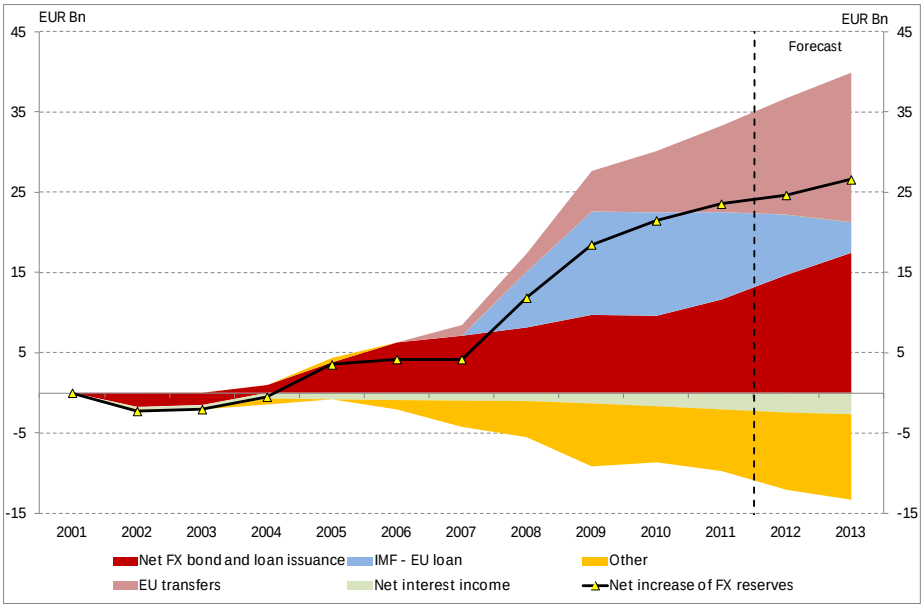
If the central bank manages the government's transaction account, new foreign exchange issuances boost the foreign exchange reserve level immediately. If the conversion of the government's foreign exchange balances to local currency are also effected by the central bank, then the additional reserves stay with the central bank even after the government starts spending the local currency equivalent of the foreign exchange issuance.

In Hungary, the increase in foreign currency debt issuance and the EU/IMF loan were the most important factors behind the growth of foreign exchange reserves (see Figure 2). In the last 10 years net debt issues contributed almost EUR 22 billion to the level of reserves. Such a large external influence has a serious impact on the central bank's ability to autonomously determine the desired level of foreign currency reserves.

Graph 2

Growth of foreign exchange reserves and foreign currency debt issuance

Cumulated changes



Foreign currency issuances can fall short in times of market stress, resulting in a lower-than-expected level of foreign exchange reserves

Evidently, foreign currency debt issuance can be a continuous net contributor to reserve growth only if new issues exceed the amounts maturing in a given year. At times of crisis this might be difficult to achieve, especially for countries with weak economic fundamentals. Even to renew maturing debt can be hard and, even if market access is possible, the increased funding cost can be punitive. In the worst case of a sudden stop, the country is unable to obtain market funding at any rate.

As a consequence, market debt issuance usually cannot work as an automatic stabiliser for foreign exchange reserves. Since the expected level of foreign reserves generally increases in times of stress, any shortfall in foreign currency funding can exacerbate the problem of inadequate foreign currency reserves.

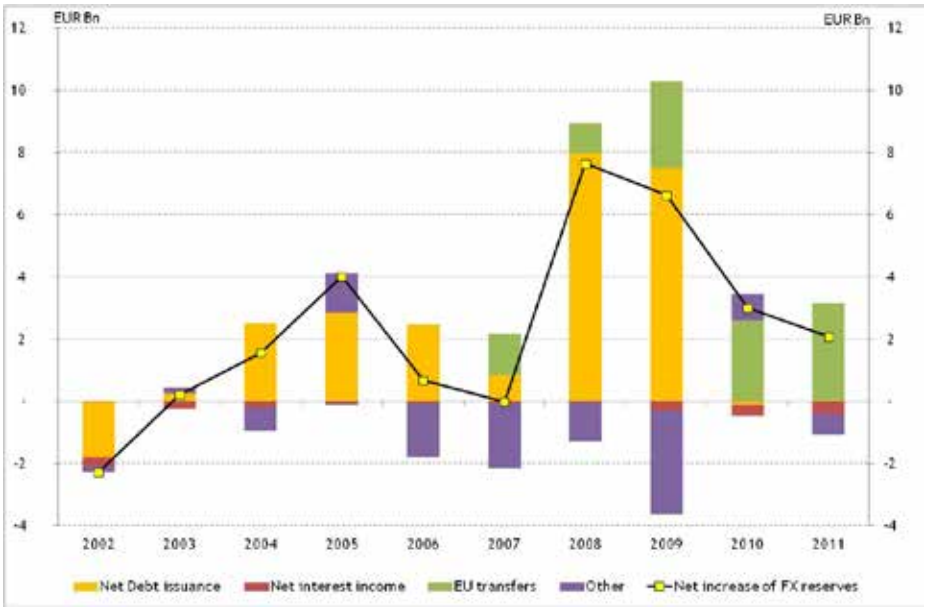
This problem can be detected in the reserve dynamics of Hungary (see Graph 3). Until 2007 the impact of the debt on reserves was quite limited: the relatively small amount of foreign currency debt issuance went hand in hand with the slow growth of international reserves. In 2008, however, when an increasing level of short-term debt and the harsher investment climate called for higher level of foreign reserves, net foreign exchange bond issuances could not be increased due to the worsening of market conditions.

Finally, the IMF/EU loan resulted in a rapid increase of foreign currency reserves, contributing some EUR 6–7 billion to reserve growth in both 2008 and 2009. Repayment of the IMF/EU loan started in the last quarter of 2011 and will peak in 2012–14. This schedule will compel Hungary to issue foreign currency debt in larger amounts than it did in the pre-crisis period. This elevated level of foreign currency funding is required if the IMF/EU funds used to increase central bank reserves are to be replaced.

Graph 3

Growth of foreign exchange reserves and foreign currency debt issuance

Yearly changes



Hedging foreign exchange risk can cause relatively large swings in foreign currency reserves

In addition to the net foreign currency debt issues there is another important factor that can have a large direct impact on the level of foreign exchange reserves, namely the flows related to the margin accounts of derivative positions held by the public sector.

As a policy matter, the Hungarian debt management agency only accepts EUR/HUF risk on its foreign currency debt. As a significant part of the foreign currency issuance occurs in currencies other than the euro, such as the US dollar or Japanese yen, the state runs a large FX swap book that is used to hedge the cash flows of non-euro denominated foreign currency bonds into euros.

As the market rate of the euro changes, the swap counterparties evaluate their positions and adjust collateral as necessary. The Hungarian debt management agency must pay out cash collateral to its counterparties when the euro appreciates against the other foreign currency while, if the euro weakens, its counterparties will pay out. Since these flows are directly debited or credited to the debt agency's foreign currency account kept at the central bank, the level of foreign currency reserves changes accordingly.

Before 2008 these flows did not significantly influence the level of Hungarian reserves. From that year, however, these flows have contributed significantly to the volatility of the foreign exchange reserves. The crisis has resulted in a much more volatile exchange rate environment, increasing the need for collateralisation. Furthermore, the currency structure of Hungary's issues has changed following the issue of a USD 3.75 billion dollar-denominated bond in early 2011. These three factors have contributed to the increasing volatility of margin call flows: before 2010 even the largest quarterly changes in the level of net cash collateral did not exceed EUR 200 million whereas in the last two years there have been quarters when the net flows reached EUR 1 billion.

The effect of foreign currency-denominated public debt on the required level of foreign reserves

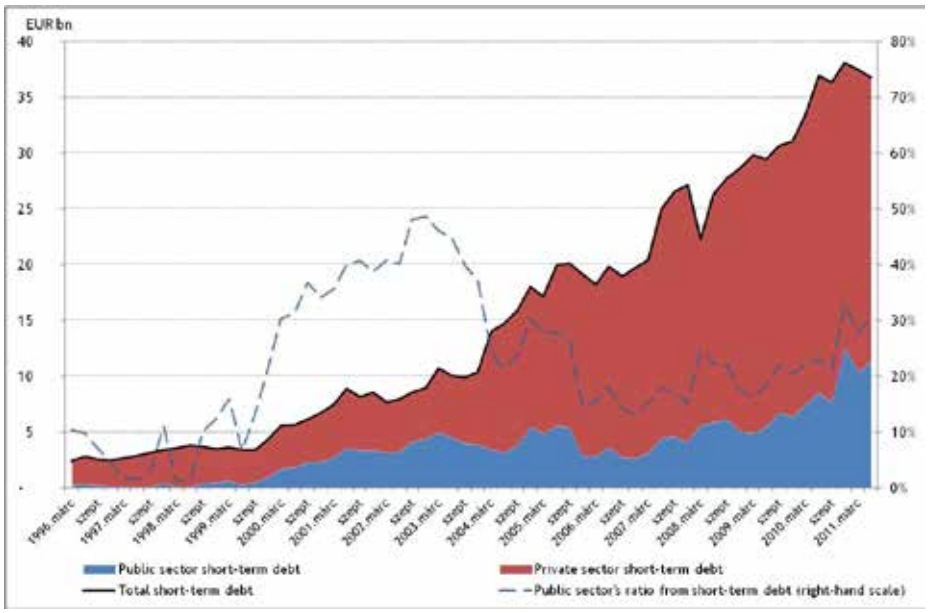
The size and structure of foreign currency-denominated public debt also influences the necessary or optimal level of foreign exchange reserves. We demonstrate this using the well known Guidotti-Greenspan rule, which states that reserves should cover a country's short-term external debt. Several channels exist through which public debt can have an impact on reserve requirements.

At the end of the 1990s, Hungary's external short-term debt was limited, and the public sector had no reliance on short-term external funding (see Graph 4). From 2000 onwards, the Guidotti-Greenspan rule started to indicate an increasing need for reserves. Up until 2003, the increasing public sector debt was the sole contributor to this process, pushing up the public sector's share within short-term external debt to 50%.

After 2003, private sector external indebtedness began to grow apace whereas the public sector's short-term debt fluctuated at around EUR 4–5 billion. These patterns have changed again after the outbreak of the financial crisis: both public and private sector short-term debt have started to increase significantly. However, the former has outpaced the latter, again resulting in an increase in public sector's contribution to short-term debt dynamics.

Graph 4

Public and private sector short-term debt



Based on these tendencies we can conclude as follows:

The total and relative amounts of public debt matter for the reserve requirement

Short-term debt tends to increase in line with the total amount of public debt. Additional public debt tends to crowd out private companies from local financial markets, pushing them to seek financing from external sources. Both of these factors lift the Guidotti-Greenspan indicator, raising the optimal level of reserves.

Furthermore, although international comparisons can provide a wide range of examples, in general, investors respond to a heavy public debt burden by shifting their activity towards shorter-term debt with the aim of reducing their interest rate and default exposures. This shortening process results in a larger reserve requirement, which usually leads to trouble

during a crisis. Such a situation is exacerbated by the liquidity shortages that typically occur during a crisis episode.

Heavy public indebtedness can cause significant interest rate differentials which can push up carry trader's demand for short-term assets

Again, tendencies can vary from country to country, but emerging economies with heavier public debt burdens and weaker fundamentals usually need to offer higher interest rates on their public debt. However, high interest rates can attract carry traders especially when the interest rates offered by the "safe haven" currencies are low and there is abundant liquidity in the global financial system. Such flows directly push up reserve requirements but, since they do not contribute to the foreign exchange reserves themselves, reserve adequacy is eroded.

Flows from margin calls can also contribute to the volatility of the reserve requirement

We have already mentioned that margin calls on the state debt management agency's FX swap contracts can cause relatively large swings in foreign exchange reserves. But it is worth emphasising that this can also affect the required level of reserves. All inflows from margin calls are regarded as short-term funding. If the debt agency becomes a net debtor at the individual counterparty level, any additional funding obtained from margin calls boosts both the foreign exchange reserves and the reserve requirement.

Long-term debt, usually considered to be stable, can also be a source of instability when liquidity needs suddenly increase during sudden sell-offs

Hitherto, we have used the Guidotti-Greenspan rule as a leading indicator to assess the reserve requirement. However, the experience of the recent crisis suggests that using short-term debt as an indicator for the foreign exchange reserve requirement can be misleading. During the crisis many countries, including Hungary, found that the volume of capital outflows depended much more on the type of capital rather than on its maturity. For example, short-term parent bank lending to subsidiaries proved to be highly stable whereas foreign portfolio investors sold large amounts of Hungarian long-term financial assets. Non-resident holdings of HUF-denominated government bonds declined by approximately 30% in the second half of 2008, which put heavy pressure on the local spot and FX swap currency markets.

The effect of foreign currency-denominated public debt on the central bank's profit and loss

A heavy public sector foreign currency debt burden affects the consolidated expenditures and revenues of the public sector via the net interest expenditures of (i) the government and (ii) the central bank. We analyse the net effect of these relatively separate channels on a consolidated level, merging the costs and benefits for both the central bank and the government.

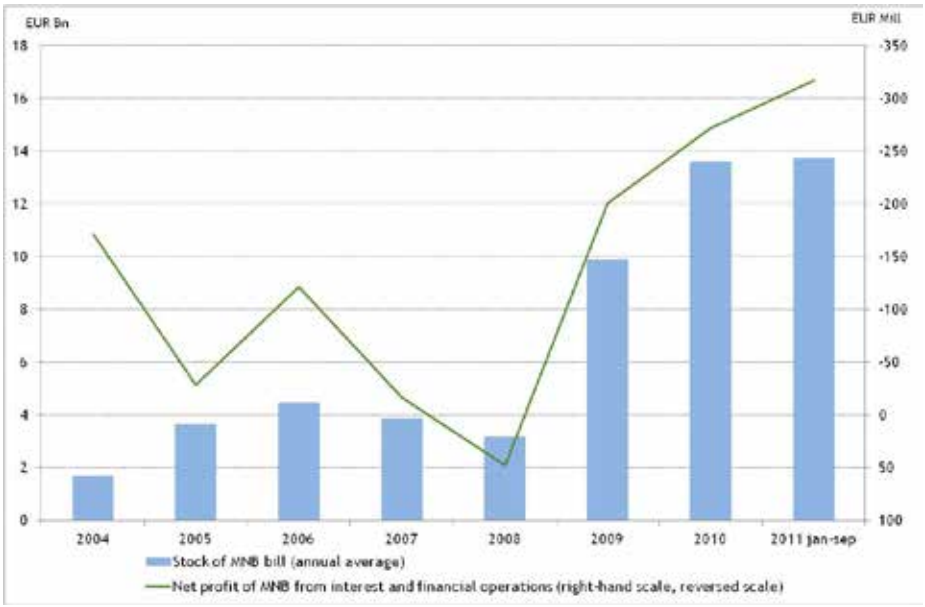
One of the key arguments for foreign currency-denominated government issuance is the lower interest rate relative to local currency funding. In the case of Hungary, this was particularly true for the EU/IMF loan package. While the average actual interest rate on the EU/IMF loans was 2.9% between 2008 and 2011, the average five-year HUF bond yield was 8.1%. If we consider only that part of the international financial package that was used for actual government financing, the comparison between the actual interest payments to the estimated interest expenditure on the HUF bonds that might have been issued instead

suggests that around EUR 0.8 billion was saved thanks to the IMF-EU loans between 2008 and 2011.[4]

However, the resulting growth in the foreign reserves of the Magyar Nemzeti Bank (MNB) increased the central bank's net interest expenditures through the higher cost of sterilisation. As the government converted the majority of the loans at the central bank to cover its debt repayment and regular expenditures, it not only raised the MNB's foreign exchange reserves, but also increased its HUF liquidity. The MNB sterilises the structural liquidity surplus via the two-week MNB bill, its main policy instrument. The resulting surge in liquidity considerably increased the MNB's interest expenditure, while the higher foreign exchange reserves were not able to offset this effect on the interest revenue side due to lower foreign exchange yields. Although the foreign exchange reserves increased somewhat more than the stock of MNB bills, the higher HUF interest rates imposed a higher overall net interest expenditure on the central bank. This effect has been augmented by the increasing spread between the MNB's policy rate and the yield on its foreign exchange reserves.[5]

Graph 5

Change of outstanding MNB bills and its effect on profit/loss of the central bank



On a consolidated level, the balance of government savings and the central bank's net extra interest expenditure is likely to be positive because of the high opportunity cost of HUF bond issuance. When the government covers its financing requirement by foreign currency debt issuance, and converts the funds raised at the central bank for HUF liquidity, then the government gains the difference between the interest rate on foreign exchange loans and the rate on HUF bonds. At the same time, the central bank's loss amounts to the difference between the policy rate and the yield on foreign exchange reserves. The average difference of the aforementioned spreads for the period between November 2008 and November 2011 is around 90 basis points, which means that the government's gain has so far exceeded the

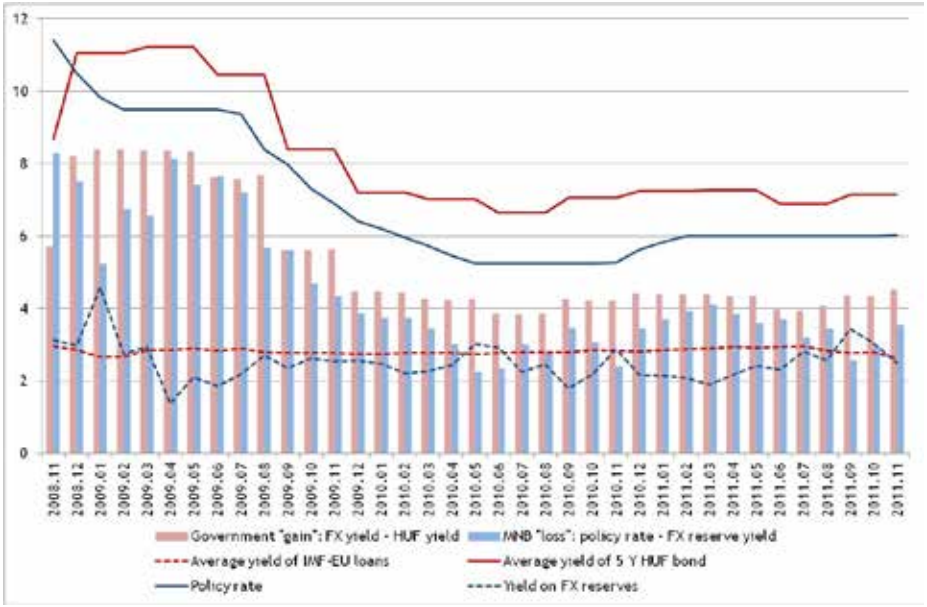
[4] Of course the counterfactual assumption on HUF bond issuance is somewhat unrealistic, as the primary market dried up totally at beginning of the period.

[5] The excess withdrawals were held at the central bank, increasing the interest revenue on FX reserves, but without any effect on the structural liquidity.

actual losses of the central bank. This gain may decrease, or turn into a loss, once the EU/IMF loan is repaid and replaced by market issuance.

Graph 6

Actual cost of IMF-EU loans on a consolidated level



Lessons from the viewpoint of foreign reserve management

As we have seen, the level and dynamics of foreign currency public debt can heavily affect the central bank's ability to formulate its own strategy on foreign reserves. This section summarises the most relevant constraints and policy conclusions.

Growing public debt tends to increase the level of uncertainty in the dynamics of foreign exchange reserves

Foreign currency debt issuance can contribute significantly to the growth of foreign exchange reserves. Yet, reserve accumulation via this channel is strongly countercyclical: during periods of abundant market liquidity and low risk awareness, there are practically no constraints. In bad times, however, when the need to use these reserves arises, an emerging economy has very limited scope to issue new debt in the necessary amounts. Furthermore, hot money investors tend to become more active as public debt grows, causing an ever-increasing volume of short-term funding to flow in and out of the country.

The central bank needs to have a buffer above necessary level of reserves

All the above factors tend to increase the uncertainties in the dynamics of foreign exchange reserves: that is, reserves are likely to fall below the expected level when sudden and large shifts occur in reserve requirements. In such a situation, simply targeting the reserve level at the precautionary level (ie at the level indicated by the Guidotti-Greenspan rule or similar) can create difficulties, given that the replenishment of reserves will take time and that, especially during a period of market disorder, the required funds will be difficult to obtain from the market. This suggests that the central bank will be better off if it maintains an additional buffer, over and above the precautionary level of reserves.

However, maintaining excess reserves implies extra costs too. The size of these costs is determined by the differential between the financing cost and the yield on reserve assets. This gap is usually positive and during an episode of market disorder it tends to widen.

The central bank's autonomous instruments may not be sufficient to counteract volatility in reserve levels and reserve requirement

Although foreign currency debt issuance plays crucial role in foreign exchange reserve growth in Hungary, the central bank has only a limited degree of influence over foreign currency debt management. The debt management agency may take reserve adequacy considerations into account, but the major drivers behind its decisions are its own preferences on the optimal level of foreign currency debt. In theory, the central bank can also issue foreign currency debt, booking it on its own balance sheet. Statistically speaking, this would not increase the government's debt, but there are several disadvantages to this approach. Thus, this is not common practice internationally.

In Hungary, the central bank has only limited scope for building foreign exchange reserves through the use of its own instruments. The direct spot purchase of foreign exchange is not practicable, because of the negative revaluation effect on the private foreign currency debt stock. Nor is it possible to impose reserve requirements on local banks based on their foreign exchange liabilities: as the banking system also suffers from a foreign exchange liquidity shortage, such a measure would increase their participation on the central bank foreign exchange tenders, thus wiping out any increase in the foreign exchange reserves. The central bank could, in principle, conduct repo or FX swap deals with large foreign banks, but these agents would be willing to provide short-term funding only. Thus reserve adequacy would not be bolstered in this way. FX swap lines extended by developed country central banks might provide an appropriate tool, but the options for Hungary are rather limited in this respect.

These considerations suggest that the central bank would face difficulties if it were forced to quickly replenish foreign exchange reserves. An important lesson of the recent crisis was that investors expected countries to hold the optimal (ie Guidotti-Greenspan rule-based) level of foreign exchange reserves even at the height of the crisis. All this implies that central banks that have not previously built up large reserve buffers may find their capacity for intervention severely circumscribed in a crisis.

Efficient coordination between government agencies is vital

Serious conflicts of interest can arise between different government institutions (such as the debt management agency, finance ministry or central bank) which can strongly influence the evolution of the foreign exchange reserves. For example, changes in the preferences of policymakers regarding the structure of the public debt can greatly affect the reserves accumulation process. A particularly crucial decision is the level at which the target ratio of the foreign component in total debt is determined. Any move to reduce this ratio can easily conflict with policy targets related to foreign exchange reserves. Furthermore, any early repayment of foreign currency public debt can have a negative side effect on foreign exchange reserves.

Clearly, swings in debt management policy can cause major difficulties for the management of foreign exchange reserves. In addition, if the issue of foreign exchange reserve adequacy has only a limited weight in the decision-making process, foreign currency debt management may lead to suboptimal results at the consolidated level. In order to avoid such an outcome and to optimally coordinate the different interests, we believe that a long-term debt issuance strategy should be defined in which both the central government and the central bank have a say in determining the size and the timing of foreign exchange issuance – a strategy which would also be binding on the debt management agency.

Additional sources of foreign currency liquidity could play an important role

Acknowledging the central bank's dependence on the government's foreign currency debt issuance, the Hungarian central bank seeks to identify and utilise other sources of foreign currency liquidity from both market and official sources. However, as we have briefly outlined in Section 6.4, the options are limited.

The only tool that would allow central bank to quickly obtain an ample amount of foreign exchange reserves is a FX swap line extended by developed country central banks. Based on the MNB's previous experience, the existence of a such a line can significantly improve market sentiment[6] even if actual utilisation is limited. Market participants "reward" such agreements not only because they represent a potential source of foreign exchange liquidity but also because they are a token of support from a developed country central bank.

The costs and benefits of foreign currency debt should be considered on a consolidated basis

When the effect of foreign currency debt on the central bank's net interest expenditure is taken into account, the overall cost of public debt financing in foreign currency may be significantly altered. Usually governments pay lower interest rates on their foreign currency debt than on domestic issuance. This is, of course, one of the most appealing features of foreign currency financing. On the other hand, the conversion of foreign exchange loans increases the domestic liquidity which the central bank will likely be obliged to sterilise. When it does so, the sterilisation cost may partially or totally offset the government's saving on its interest payments. If the increased interest expenditure for the central bank causes losses, the government is ultimately obliged to reimburse that loss, and thus sterilisation costs should be taken into account when the cost of foreign exchange financing is assessed. The consolidated outcome depends on the difference between the interest rate on international loans and the rate on HUF bonds compared to the difference between the policy rate and the yield on foreign exchange reserves.

If the net interest expenditures of the government and the central bank are consolidated, we estimate that the cost of the foreign exchange loans is likely to be slightly lower than the equivalent domestic issuance would be. However, this gain may turn negative in future if foreign exchange loans are rolled over into new foreign exchange bond issues with higher yields.

Conclusion

This paper focuses on the interactions between public debt policy and foreign exchange reserve management. We found that, although foreign currency debt issuance can contribute significantly to the growth of foreign exchange reserves, it can cause serious difficulties in assessing reserve adequacy. This is especially the case during a crisis when it becomes almost impossible to refinance maturing debt at a time when, for various reasons, the reserve requirement may be rising still further. On the other hand, the accumulation of foreign exchange reserves may affect the public deficit and debt, both directly and indirectly, especially if it is implemented through foreign currency debt issuance by the government.

Based on these observations, several lessons could be drawn. Rising public debt tends to increase the uncertainty in foreign exchange reserve dynamics. The reserve requirement can

[6] Markets responded favourably in the case of other countries obtaining an FX swap line from a developed country central bank: see Aizenman and Pasricha (2009).

fluctuate within a wider range but the central bank has only limited influence on the reserve accumulation process. As a consequence, the debt management policy may result in a suboptimal solution on a consolidated basis if the needs of reserve adequacy are not taken into account within the decision-making process on foreign currency debt issuance. To avoid such negative side effects, we believe that a long-term debt issuance strategy should be defined where both the central government and the central bank have a say in determining the size and the timing of foreign exchange issuance. Further, if the central bank wants to enhance its capacity to intervene during a crisis, it should seek to identify and utilise other sources of foreign exchange liquidity. But the options here are limited: we believe that the most appropriate tool that would enable a central bank such as the MNB to rapidly obtain an ample amount of foreign exchange reserves is an FX swap line provided by a developed country central bank.

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