

Mihály Hoffmann, Zsuzsa Kékesi and Péter Koroknai: Changes in central bank profit/loss and their determinants*, 1

In its monetary policy decision-making, the central bank of Hungary primarily focuses on the achievement of price stability. Without prejudice to this objective, it supports the maintenance of financial stability and the economic policy of the Government.² While the low inflation environment resulting from the central bank's operation and the sound functioning of financial markets and the financial intermediary system can be considered benefits at the society level, direct costs appear in a concentrated form, in the profit/loss of the central bank. The MNB strives to achieve the monetary policy objectives at the lowest possible cost. Therefore, it continuously monitors developments in the factors that determine the central bank profit/loss. The recent significant increase in the MNB's interest expenditure is primarily attributable to economic developments related to the crisis. Firstly, the state was compelled to borrow foreign exchange, while maintenance of higher-than-earlier foreign exchange reserves became justified due to the external vulnerability of the country. As a result of the two factors, the MNB's balance sheet total doubled, and a much greater part of the foreign exchange reserves had to be financed from MNB bills than before. Secondly, in view of the deterioration in risk assessment, the forint-foreign exchange interest rate spread, which increased following the crisis, and made the holding of foreign exchange reserves more expensive than earlier. At the same time, the loss of the central bank was reduced by the depreciation of the exchange rate of the forint and the exchange rate gain realised on the foreign exchange sales transactions with the Government Debt Management Agency (ÁKK) and on the foreign exchange sales related to the early repayment programme. It is also important to emphasise that, in parallel with the strong deterioration in central bank interest income as a result of the foreign exchange financing substituting for the issue of forint-denominated government securities, a considerable amount of interest was saved in the budget, and this saving offset the central bank interest loss to some extent. In our forecast, which is consistent with the September issue of the Quarterly Report on Inflation, we expect that the central bank's interest loss may be offset by the profit on foreign exchange sales this year again. Consequently, the MNB's 2013 profit/loss may be close to zero. Over the medium term, with a decline in Hungary's external indebtedness and a gradual return of the state to forint financing, the central bank's balance sheet may shrink. At the same time, this process may be decelerated by the Funding for Growth Scheme launched by the MNB, as a result of which, in parallel with an improvement in the SME sector's access to financing, the balance sheet total of the central bank will increase, ceteris paribus. If the forint policy rate also remains at a low level, the central bank may have a close-to-zero profit/loss in the coming years as well, also taking in account the costs of the economic stimulus programme.

THE RELATIONSHIP BETWEEN MONETARY POLICY AND CENTRAL BANK PROFIT/LOSS

The statutory primary objective of the Hungarian monetary policy is the achievement and maintenance of price stability. In addition, the central bank also safeguards financial stability. The central bank develops

and applies its monetary policy instruments in order to achieve these objectives.³ The Monetary Council's decisions on the level of the central bank policy rate, on individual elements of the set of monetary instruments or on the desired level of foreign exchange reserves are primarily determined by developments in inflation, the efficiency of monetary transmission and aspects of financial stability. At the same time, the Magyar Nemzeti Bank as a responsibly

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

¹ Acknowledgements are due to the staff of the Statistics and Accounting Directorates for their professional assistance provided in the preparation of this article.

² For more details on the primary objectives of the MNB, see Article 3 of Act CXXXIX of 2013 on the Magyar Nemzeti Bank.

³ For more details on the monetary policy framework and instruments, see: MNB (2012).

operating state institution must ensure the achievement of monetary policy objectives at the lowest possible costs, as the profit/loss of central bank operation influences fiscal developments as well.

Changes in central bank profit/loss are primarily determined by the structure of the central bank balance sheet, the domestic policy rate, the forint exchange rate and yields on foreign exchange investments. Compared to these factors, the role of operating profit/loss is negligible. It is clearly visible from the above list that the most important variables of monetary policy influence changes in profit/loss the most. Accordingly, central bank profit/loss is partly a consequence of monetary policy decisions. Items that influence profit/loss, but are not determined by monetary policy instruments are externalities for the central bank. They include factors that change the size of foreign exchange reserves (foreign exchange borrowing by the state, amount of EU transfers), external interest rates and largely the exchange rate as well, due to the floating exchange rate regime. All of this also means that while striving to achieve its primary objective, the central bank has relatively limited room for manoeuvre to influence its profit/loss.

It is also important to emphasise the asymmetry in considering benefits and costs: while the low inflation environment resulting from the central bank's operation, sound functioning of financial markets and of the financial intermediary system as well as the maintenance of a favourable external risk assessment can be considered benefits at the society level, possible costs first appear in a concentrated manner in the central bank profit/loss and then in the state budget. In this sense, a central bank loss in an amount which is justified from the perspective of monetary policy can also be considered a kind of 'insurance premium'. One of the reasons why the MNB covers the additional costs stemming from holding foreign exchange reserves is that if investors believe that the level of foreign exchange reserves is sufficient, it may be reflected in a decline in the country risk premium and thus in lower yields of forint investments as well.

The structure of the central bank balance sheet and central bank profit/loss reflect the results of numerous domestic and international economic developments. Therefore, the central bank balance sheet may also be considered as a sensitive indicator that indicates the state of the economy. In an optimal case, the foreign exchange reserves in the central bank balance sheet are a

good indicator of the size of external vulnerability of a given economy: higher reserve requirement indicates greater vulnerability and higher external indebtedness. Changes in reserves are closely related to general government financing and international financial trends as well, because the MNB – as the bank of the state – conducts the debt manager's foreign exchange transactions, and the EU transfers received by Hungary are also converted in the central bank. The stock of instruments that absorb the structural excess liquidity typical of the Hungarian economy (two-week bill, overnight deposit, settlement account) indicates the current liquidity situation in the banking sector, while the changes in the forint and foreign exchange deposits of the budget reflect the current liquidity situation of the state. Central bank liabilities also include the volume of cash in circulation, which shows the extent of economic activity, the expected developments in inflation or the extent of confidence in the banking sector well. The difference between domestic and external interest rate levels, which is a determinant in terms of the profit from interest, may provide a picture of developments in inflation as well, in addition to risk assessment. The central bank has a significant open FX position, and consequently exchange rate movements may have a considerable impact both on the structure of the balance sheet and developments in profit/loss.

The structure of our article follows the train of thoughts described below. As developments in central bank profit/loss are fundamentally influenced by the structure of the central bank balance sheet, first the structure of the MNB's balance sheet is analysed. This is followed by a presentation of the main items of central bank profit/loss and the factors that influence such items. Then comes a brief summary of the economic developments that determined the past and expected developments in certain factors of central bank profit/loss. A box also discusses how the method of financing the general government affects central bank profit/loss. This is followed by a description of how the central bank's realised and unrealised profit/loss affects the fiscal deficit and government debt.

STRUCTURE OF THE CENTRAL BANK BALANCE SHEET

Developments in the MNB's balance sheet in recent years were driven by the rise in foreign exchange reserves and the stock of MNB bills, which increased in parallel. One of the most important tasks of the MNB is to hold an adequate quantity of foreign exchange reserves.⁴ At the same time, the central bank only has a limited direct influence on

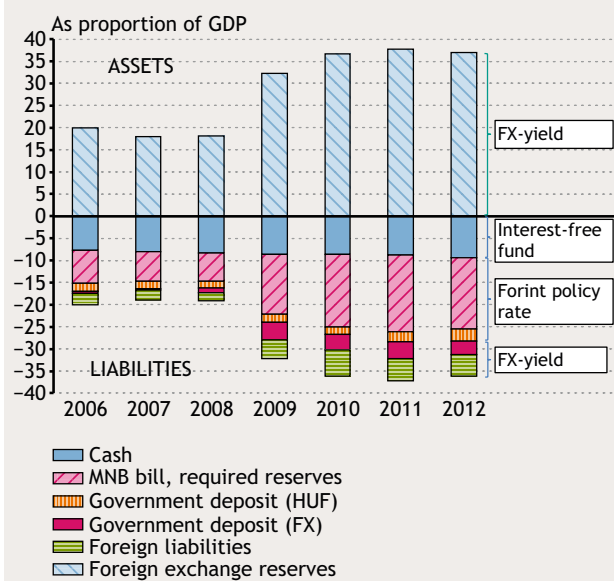
⁴ About the objectives of holding foreign exchange reserves, see: Antal and Gereben (2011).

foreign exchange reserves; their amount is primarily determined by inflows of EU transfers and the net foreign exchange borrowing of the state.⁵ In parallel with the rise in foreign exchange reserves, the government deposit – typically temporarily – increases on the MNB’s liabilities side, while over the longer term the two-week MNB bill issued by the central bank offsets the increase in reserves (for a more detailed description of this mechanism, see the section presenting the changes in the MNB’s profit/loss in recent years). It is also important to note that in addition to transactions, the developments in the MNB’s balance sheet may also be influenced by the revaluation of already existing stocks in the event of shifts in exchange rates; the former affects the realised profit/loss of the central bank, whereas the latter affects the unrealised profit/loss (see later).

The MNB typically finances the relatively low-yield foreign exchange reserves from forint sources whose interest rates considerably exceed the foreign exchange yields. If, in addition to the main factors influencing the current changes, we also wish to know what the central bank uses to finance the foreign exchange reserves on the assets side of the balance sheet, the most important items are as follows (Chart 1).

- The *cash* issued by the central bank provides interest-free funds; therefore, it is a very cheap way of financing foreign exchange reserves. The amount of cash in circulation is determined by the cash demand of the economy.
- Of the central bank’s *foreign liabilities*, the foreign exchange loan taken from the IMF during the crisis to increase the foreign exchange reserves is worth mentioning; the MNB prepaid this in August 2013. Based on an agreement with the state, the central bank is not allowed to borrow from abroad, i.e. apart from the IMF programme, the MNB cannot finance the foreign exchange reserves from foreign sources.
- The state holds its account with the central bank; therefore, both the *foreign exchange and forint deposits placed by the state* represent sources of financing for the MNB. As the government deposit, which depends on the financing situation of the budget, is a permanently available (practically sight) deposit, the central bank pays a relatively low interest rate on the state’s foreign currency deposit and pays the central bank policy rate on its forint deposits.

Chart 1
Changes in the main elements of the MNB’s balance sheet as a proportion of GDP (annual average values) and interest realised on the balance sheet items



- Based on the deposits placed with them, banks build *required reserves*, on which the MNB also pays the policy rate. It is true for both cash and required reserves that their size is a given condition for the central bank, as the result of the portfolio decisions of economic agents is reflected in the central bank balance sheet (Komáromi, 2007). The amount of and interest on required reserves are also considered given conditions because their system cannot be modified without changing the current monetary policy strategy.
- The remaining financing of *foreign exchange reserves* originates from the sterilisation holdings and within that primarily from the MNB bill, which pays the policy rate. As the asset side and the other liability-side items are external conditions, ultimately it is the MNB bills held by economic agents that are determined on the basis of the ‘residual principle’, financing the portion of foreign exchange reserves that is not covered by any other source. Accordingly, due to balance sheet identity, the sterilisation holdings mainly constitute the item that offsets the changes in foreign exchange reserves, and in the prevailing monetary policy framework the central bank has no influence on the related developments. The central bank can primarily have an effect on the structure of the sterilisation holdings, i.e. on how the excess liquidity is distributed between the two-week MNB bill and the overnight deposit.⁶

⁵ The foreign exchange auction accompanying the early repayment was the most significant FX market action taken by the central bank in the recent years.

⁶ For more details on the role of the MNB bill, see: Balogh (2009).

COMPONENTS OF THE CENTRAL BANK PROFIT/LOSS

The presentation of the main characteristics of the balance sheet structure is followed by an analysis of central bank profit/loss below. From an accounting perspective, central bank profit/loss consists of realised⁷ and unrealised profit/loss. Realised profit/loss consists of three basic components. They are: (1) net interest income and realised gains/losses arising from financial operations, (2) net income arising from exchange rate changes, and (3) operating costs and expenses. The components of profit/loss and the main factors affecting the profit/loss are summarised in Chart 2.

The central bank interest balance is one of the most important factors of profit/loss and is primarily influenced by the balance sheet structure and the interest margin.

Net interest income is the difference between interest expenses on the liability-side interest-bearing liabilities (e.g. liquidity absorbing instrument, required reserves, central government deposits) and the interest income realised on foreign exchange reserves. While the MNB pays central bank policy rate on the two-week bills and fiscal deposit accounts, it realises lower foreign exchange receipts on the foreign exchange reserves than the forint interest rates.⁸

Realised gains/losses arising from financial operations are closely related to the profit from interest and contain the profit/loss from changes in market prices of securities. The yield realised on securities is reflected in interest income as well as changes in market prices of securities. The importance of the latter item has increased significantly in the recent past, because in the global low yield environment it is typically possible to purchase only government securities whose purchase price is higher than the nominal value. When these securities are sold or mature, a loss is produced: the difference between the purchase price and the nominal value is a profit-reducing item, as current sovereign yields are lower than the ones upon issue. However, this effect is offset by the higher foreign exchange interest income received on securities in earlier years. Consequently, on the whole, this only means a regrouping of the profit/loss between years.

Another important item in the MNB's profit/loss is net income arising from exchange rate changes, which

mainly depends on the changes in the foreign exchange position and the exchange rate of the forint. The central bank has a considerable open foreign exchange position, as the counterparts of foreign exchange assets are mainly forint liabilities, and thus changes in foreign exchange rates may significantly influence the MNB's profit/loss through revaluation effects and currency conversion. However, realisation of the profit/loss requires a change in the foreign exchange position as well. A transaction like this can be a forint-euro conversion by the state or transactions with market participants. Whether the result is a profit or loss, the determinant is the relationship between the official exchange rate on the given day and the average cost rate. At present, the cost rate is lower than the current rate; consequently, the central bank realises an exchange gain upon the selling of foreign exchange.⁹

Regarding the objectives and instruments of monetary policy as given conditions, the central bank only has a material influence over the third profit/loss factor, i.e. operating cost and expenses, while this profit/loss item is of the lowest importance, accounting for some 4-5 per cent of all expenses. In terms of the components that determine profit/loss the ones presented above are primarily related to the operation of monetary instruments, whereas the third item is less related to this. The most important items related to operation are the costs of coin, banknote and commemorative coin production, provisions, and material and staff expenditures relating to banking operation.

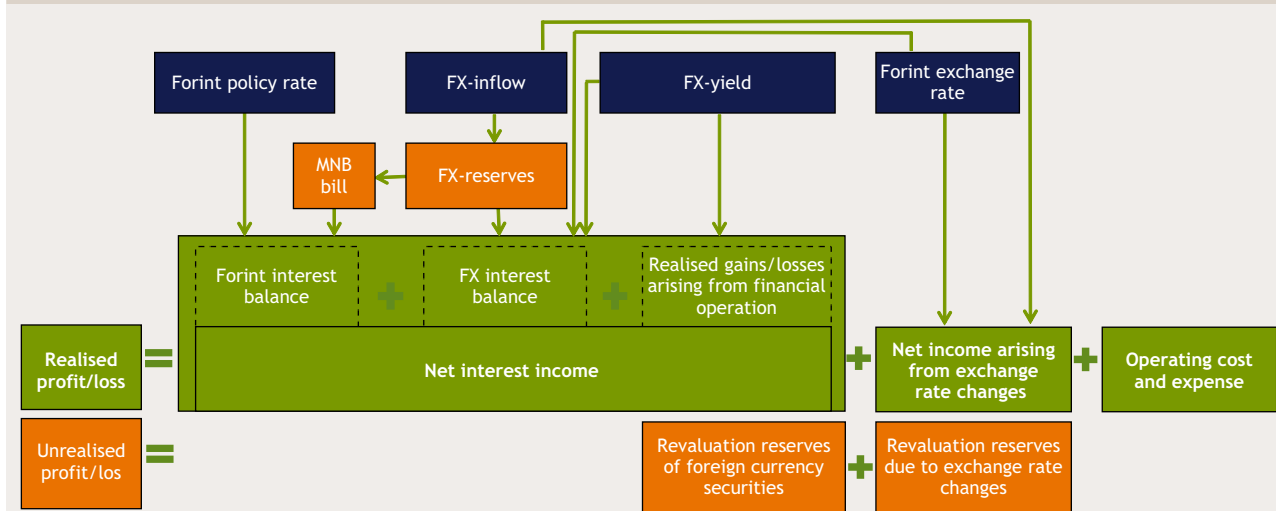
Although the above three factors constitute the central bank's profit/loss for the year, from an accounting perspective unrealised profit/loss items are also distinguished. Their emergence stems from exchange rate changes and the resulting revaluation effects. Firstly, if the forint exchange rate changes, foreign currency-denominated assets are revalued, but the mostly forint-denominated items on the liabilities side are not. However, balance sheet identity requires a change in equity, and within that in the *revaluation reserves due to exchange rate changes*. Accordingly, the open foreign currency position of the central bank has an impact not only on the profit/loss for the year, but also on the unrealised exchange rate gain. Secondly, unrealised profit/loss may also emerge if the price of foreign currency

⁷ Realised profit/loss basically means the profit/loss for the year. It is worth noting, however, that the profit/loss for the year contains elements of unrealised profit/loss as well (e.g. accruals and deferrals, provisioning).

⁸ Besides, the MNB pays forint interest corresponding to the bottom of the interest rate corridor on overnight deposits and foreign exchange interest on foreign currency deposits of the state.

⁹ In the accumulation of foreign exchange reserves, individual items contributed to the increase in the reserves at different points in time and at different exchange rates. The average of these exchange rates weighted by the stock is the average cost rate.

Chart 2
Components of profit/loss and the main factors affecting profit/loss



securities changes. The unrealised profit/loss item originating from this is the *revaluation reserves of foreign currency securities*, which contains the profit or loss stemming from changes in securities prices.¹⁰

PROFIT/LOSS OF THE MNB IN RECENT YEARS

In the following, we present a brief overview of the past and possible changes in the profit from interest and in the exchange rate gain, which are the most important items of the central bank's profit/loss. These profit/loss items are primarily determined by the monetary policy instruments used for the sake of price stability and financial stability as well as by economic developments. In terms of central bank profit/loss, three fundamental stages can be distinguished: (1) the period prior to the financial crisis, (2) the years following the crisis, when the central bank balance sheet swelled, and (3) shrinkage of the central bank balance sheet. The chapter ends with a brief overview of the changes in the MNB's operating profit/loss. Although it is not closely related to the central bank's activity carried out in order to achieve its primary objective, we still consider its presentation necessary to provide a complete picture of the central bank's profit/loss.

The pre-crisis period

Until the beginning of the crisis, the central bank's balance sheet total did not change significantly, because the general government was mainly financed by issuing

forint-denominated government securities (Chart 1). Following the issuance of forint-denominated government securities, only the liabilities side of the MNB's balance sheet temporarily shifts, while the balance sheet total and the stock of MNB bills remain unchanged. This is because economic agents may ultimately raise the money necessary to purchase government securities by reducing their bank deposits, and banks reduce their MNB bill holdings due to their declining forint liquidity. In parallel with the decline in MNB bills outstanding, the forint deposits of the state increase in the MNB's balance sheet, as a result of the proceeds from the securities sold. At the same time, the state issued the government securities to be able to effect payments (e.g. pension payments, salaries to civil servants) from the funds raised this way; in parallel with that, its forint deposits held with the MNB decline. As a result of these disbursements, the liquidity of the economy grows again (economic agents deposit the money received at banks and the money spent by them is deposited at banks by those agents who receive it), which eventually adds to the funds of the banking sector. The liquidity increased in this way is placed by banks with the MNB in the form of two-week bills, i.e. among the liabilities of the MNB, the decline in the deposits of the state is offset by an increase in the MNB bills outstanding. Accordingly, both the forint deposits of the state and the MNB bills outstanding return to their earlier levels (Chart 3, left panel). At the same time, it is worth mentioning that the ratio of foreign exchange debt within government debt started to increase already prior to the crisis: growing from around 25 per cent in 2002, it already exceeded 30 per cent in 2008.

¹⁰ If these securities mature or are sold, the relevant profit/loss effect is transferred from the unrealised profit/loss to income from financial operations.

In the 2000s, the MNB's average loss was around zero, which – in addition to the low balance sheet total – was also attributable to the relative stability of the forint exchange rate or its favourable shift in terms of the exchange rate gain in this period. Although the interest balance of the MNB showed a loss in most of the period under review, the size of the loss was negligible due to the relatively low balance sheet total. The negative interest balance was a result of the balance sheet structure (liquidity absorbing sterilisation) and the high level of the forint-foreign exchange interest margin. On the whole, no cumulative loss was produced in the pre-crisis years, as the profit due to realised exchange rate gains usually exceeded the loss due to net interest income and net income from financial operations. This was because the central bank typically recorded a profit on foreign exchange operations, due to favourable changes in the exchange rate in terms of profit/loss.

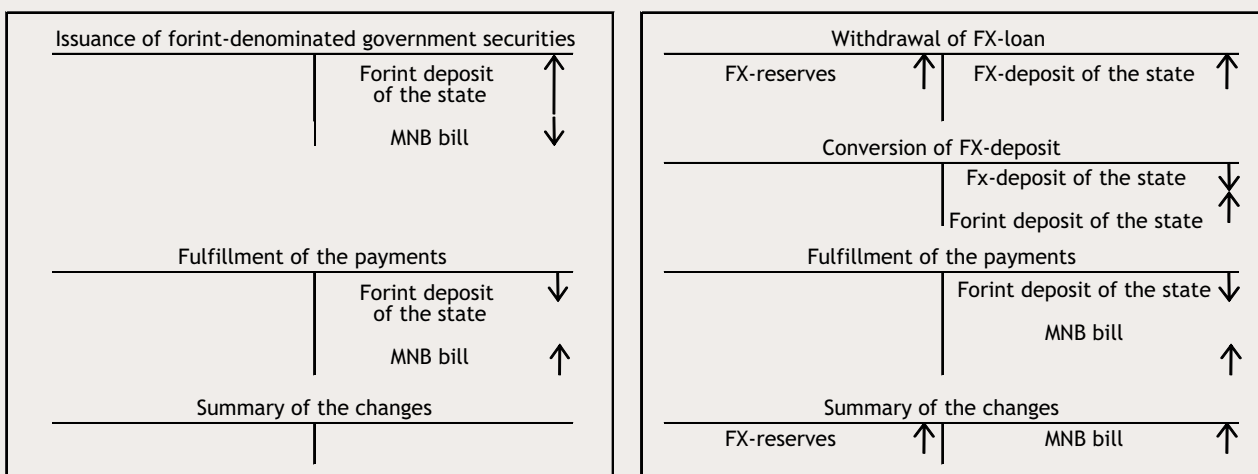
The years following the outbreak of the crisis, expansion of the central bank balance sheet

The EU/IMF loan borrowed at the outbreak of the crisis due to the increasingly unfavourable financing position of the general government resulted in a rise in foreign exchange reserves. Although the sale of Treasury bills with a maturity of up to one year continued, the crisis that broke out in 2008 reduced investors' willingness to take risks to an extent that the Hungarian state could not sell government bonds in the market, and it became difficult to finance government debt, which amounted to 66 per cent of GDP.

In this situation, Hungary applied for help to the international institutions, from which it borrowed nearly a total EUR 13 billion in several instalments. As a first step, the state placed the foreign currency loan drawn as a foreign currency deposit with the central bank, which also resulted in an increase in the country's foreign exchange reserves.¹¹ At the same time, an increase in foreign exchange reserves was necessary as well, because following the outbreak of the crisis the demand of the Hungarian economy for foreign exchange reserves grew significantly. Due to the government debt and the external debt ratio (and within that the banking sector's significant short-term external debt), which are considered high in international comparison as well, and to the financing risks of the general government deficit, foreign investors and credit rating agencies expected Hungary to have much higher foreign exchange reserves than before. The reserve requirement was also increased by the fact that in parallel with the outbreak of the crisis the maturity structure of external debt also changed in an unfavourable direction, and the weight of short-term debt elements increased considerably.

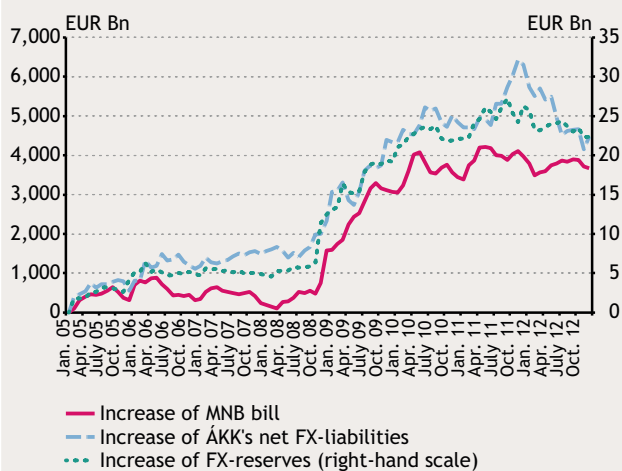
When the state spends the foreign currency loan on forint disbursements, foreign exchange reserves are not financed by the government deposit any longer, but by the stock of MNB bills purchased by economic agents (mainly banks). The deficit and some of the maturing government bonds were financed by the central budget from the foreign currency loan. However, the state needed forints for these payments, and so it converted the foreign currency into forints at the MNB. In doing so, the state

Chart 3
Effect of forint and foreign exchange financing of the state on the MNB's balance sheet



¹¹ It is worth making a distinction between the expansion of the balance sheets of developed country central banks and of the MNB. While the central banks of developed countries (e.g. ECB, Fed, Bank of England, Bank of Japan) basically obtained considerable amounts of receivables from securities in their own currencies (which are sterilised at a low cost) within the framework of asset purchase programmes, in the case of the MNB the level of foreign exchange reserves rose significantly, and it is financed from higher-interest forint liabilities.

Chart 4
Foreign exchange reserves, MNB bills outstanding and the net foreign exchange debt of the ÁKK*



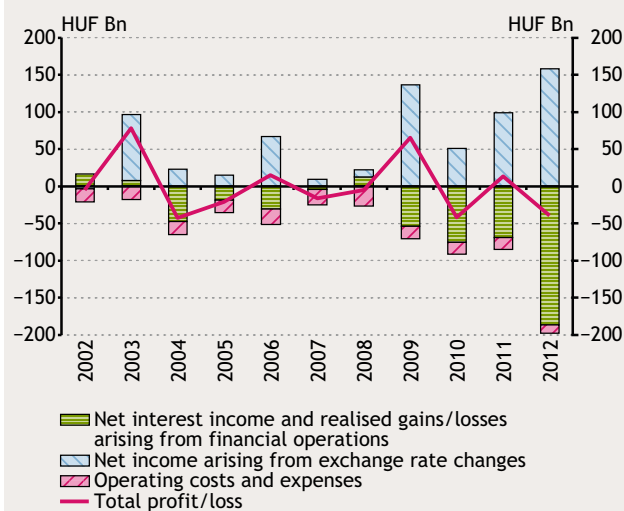
* The net foreign exchange debt of the ÁKK means the difference between the foreign exchange debts of the state (foreign currency loans, foreign currency-denominated bonds) and its foreign exchange assets (foreign currency deposits, foreign exchange receivables from banks). Note: The widening gap between the state's net foreign exchange debt and its foreign exchange reserves observed in late 2011 and early 2012 was caused by the depreciation of the exchange rate.

converted its foreign currency deposit into a forint deposit, while the MNB's foreign exchange reserves remained unchanged. When the state effected payments, among the MNB's liabilities the decline in government deposit was substituted by an increase in MNB bills outstanding, through the mechanism presented earlier. Eventually, the foreign currency loan borrowed by the state added to the balance sheet total of the MNB, increasing the foreign exchange reserves on the assets side and the MNB bills outstanding on the liabilities side (Chart 3, right panel).¹²

Due to the above described process, the changes in MNB bills outstanding were similar to those of foreign exchange reserves, which typically increased because of the state's net foreign currency borrowing (Chart 4).

Although foreign exchange reserves had already risen in 2008 and 2009, no major deterioration in profit/loss was observed in the past years, despite an increase in net interest expenditures (Chart 5). In addition to the high level of foreign exchange reserves, the increase in the difference between forint and euro yields also contributed

Chart 5
Changes in central bank profit/loss



to the growing loss on interest following the crisis. This was also attributable to a decline in euro yields as well as to the rise in the central bank policy rate as a result of the crisis. The loss was temporarily reduced by the fact that, due to the global low-yield environment, securities purchased by the MNB above their nominal value (at a higher coupon) also became included in the foreign exchange reserves. Due to holding high-coupon securities, higher foreign exchange interest income was observed, thus improving the profit from interest. However, a loss is produced upon the maturity of these securities, as approaching the maturity, the market price gradually sinks back to the nominal value. Therefore, the purchase of these types of papers eventually only results in a regrouping of profit/loss between years, and postpones the impact of the changes in market interest rates on the profit/loss to a later point in time.¹³

Following the outbreak of the crisis, in parallel with the depreciation of the forint exchange rate, the central bank realised a considerable profit on the change in the foreign exchange position, which also offset the deterioration in the profit from interest. In addition to the weak exchange rate, another possible explanation for the exchange rate gain is that the considerable increase in foreign exchange reserves took place at the beginning of the crisis, when the exchange rate of the forint was relatively strong, and thus the average cost rate of the foreign exchange reserves was

¹² Since the outbreak of the crisis, the deposits of the budget with the central bank also increased significantly compared to the pre-crisis level. This means that some of the MNB's interest expenditures are directly included in the budget, i.e. the deterioration in central bank profit/loss appears directly as well in the increase in the interest balance of the ÁKK. On the whole, however, as the MNB pays the policy rate on both the forint deposit of the state and the two-week bank bill, this is only a liability-side rearrangement, without any effect on profit/loss.

¹³ Complying with Government Decree 221/2000 (XII. 19.), the MNB does not defer the difference between the purchase price and the nominal value. The difference between the two is taken into account in the profit/loss only upon maturity or selling, as realised gains/losses from financial operations.

also relatively low. As a result of the crisis, however, the exchange rate depreciated considerably, by some 10-15 per cent, and thus the central bank made significant profit on the foreign exchange operations.

The major increase in the exchange rate gain observed in 2011 and 2012 is mainly attributable to a one-off item, namely the central bank instrument (foreign exchange auction programme) introduced due to the early repayment scheme. At the foreign exchange tenders, the central bank sold foreign currency to commercial banks at a higher rate than the average cost rate of the foreign exchange reserves, and this resulted in profit for the central bank. At the auctions, the MNB sold foreign exchange amounting to some EUR 2.5 billion, realising a total exchange gain of nearly HUF 100 billion in the aforementioned two years.¹⁴

In spite of the increased balance sheet total, the central bank's 2013 profit/loss may be around zero, which is mainly attributable to stabilisation of the exchange rate gain at a high level. As a result of the high level of foreign exchange reserves and the declining but still significant interest margin, the interest balance may show a loss this year as well. At the same time, the exchange rate gain may become stable at a high level as a result of a possible major contribution by the ÁKK-organised repayment of the IMF loans borrowed by the Hungarian state and the exchange rate gain on foreign exchange sales due to the maturing of foreign currency-denominated bonds. Accordingly, the exchange rate gain that can be realised on foreign exchange transactions may offset most of the interest loss. Therefore, the central bank profit/loss is not expected to affect the deficit of the 2014 budget. All of the above factors (purchase of high-coupon securities, depreciation of the exchange rate, foreign exchange auction programme and

foreign exchange sales organised with the ÁKK) contributed to the fact that the expansion of the central bank balance sheet and the yield difference due to high risk spreads did not result in a major central bank loss.

The central bank interest loss is evolving in parallel with an improvement in the profit from interest of the Government Debt Management Agency (ÁKK). Therefore, at the level of the consolidated general government¹⁵ the expansion of the central bank balance sheet results in an additional cost stemming only from the maintenance of higher foreign exchange reserves, which entails other advantages. There is a close relationship between the financing of the debt of the budget and central bank profit/loss. Therefore, it is worth analysing and presenting the developments jointly as well, at the level of the consolidated general government. Numerous studies have already been conducted on this subject, including Rocha and Saldanha (1992) in the international literature, or Barabás et al. (1998) as well as Czeti and Hoffmann (2006) in the domestic literature. The basic idea is that it is necessary to examine the parts of general government taken in a wider, economic sense in a consolidated manner, and not one by one separately. It means that it is worth analysing the central bank profit/loss as well together with the interest expenditures of the state, at a consolidated level (for more details, see the box). Accordingly, at a consolidated level, additional cost is caused by the fact that – due to the vulnerability of the country and the crisis – the central bank has kept higher foreign exchange reserves, which entails costs. However, this may be considered as a kind of insurance premium, and by maintaining the required foreign exchange reserves the central bank ultimately contributes to minimising the risk premium on Hungarian government securities and to the reduction of the funding costs of the national economy as a whole.

How does foreign exchange borrowing by the government influence the MNB's profit/loss?

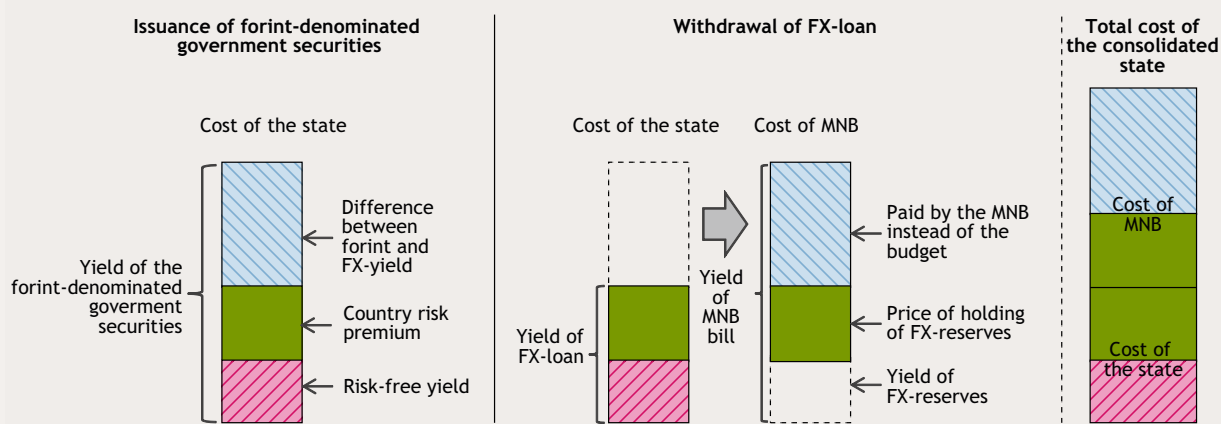
If the state finances the deficit and the debt from foreign exchange loans instead of forint-denominated government securities, the difference between the costs of forint and foreign exchange financing is paid by the MNB. When forint-denominated government securities are issued, the cost to the state is the interest on the government security, and this cost can essentially be decomposed into three parts (Chart 6, left panel): (1) risk-free yield paid by every country, (2) country risk premium to be paid because of the riskiness of the instruments issued by the Hungarian state, and (3) the difference between the sovereign forint and foreign exchange yields (which may, for example, evolve due to the exchange rate risk premium). However, when foreign exchange loans are issued, the state only pays the interest on the FX loan, i.e. it saves the difference between the Hungarian forint and foreign currency yields (Chart 6, middle panel). As seen in the previous chapter, the stock of MNB bills also increases in parallel with the issuance of

¹⁴ For more details on foreign exchange auctions, see: Pulai and Reppa (2012).

¹⁵ In our analysis, the concept of consolidated general government is used in an economic sense. In statistical terms, the budget and the MNB are separate units. Our box is basically a comparison of central bank profit/loss and the budget in an economic sense, which is a good illustration of the consolidated costs.

Chart 6

Diagram of the distribution of the cost of deficit financing from forints or foreign exchange



foreign exchange loans, resulting in an interest cost for the MNB as well. Decomposing the interest of the MNB bill into the aforementioned three parts, the following can be established.

- The risk-free yield paid in the interest of the MNB bill is offset by the yield of the foreign exchange reserves, which increased due to the foreign exchange loan borrowed. As the foreign exchange reserves are held by the central bank for safety purposes, the reserves mainly consist of low-interest, but risk-free securities.
- Ultimately, the country risk premium can be considered the consolidated cost of deficit financing from foreign exchange loans, which, at the same time, is also the price of holding higher foreign exchange reserves. Because if the MNB intended to increase its foreign exchange reserves, it could – theoretically – do so by foreign exchange borrowing, i.e. the country risk premium should be paid in any case. It is important to note that this cost is compared to the higher foreign exchange reserves: if the level of such reserves meets investors' expectations, it may have a mitigating effect on the country risk premium as well as on developments in forint yields.
- Ultimately, the third part of the interest on the MNB bills is paid by the MNB instead of the budget. While the budget saves the difference between the sovereign forint and foreign exchange yields by the borrowing foreign exchange, the MNB pays a similar portion of interest on the MNB bills outstanding, which increased due to the higher foreign exchange loan.

Accordingly, while in the case of financing covered by government securities issues the only cost is the interest on forint-denominated government securities, in the case of foreign exchange borrowing, the consolidated general government including the MNB pays the interest on the foreign exchange loan (state) as well as the interest on the MNB bill (MNB). In other words, at the whole-economy level, foreign currency borrowing is more costly than issuing forint-denominated government securities. It is important to emphasise that in the case of foreign currency loans not only is the financing of the state ensured (as in the case of issuing government securities), but foreign exchange reserves also grow. This implies that the higher cost is attributable to the holding of foreign exchange reserves, which reduce the vulnerability of the country.

The higher-than-earlier foreign exchange borrowing resulted in considerable interest saving for the general government. However, no saving was achieved at whole-economy level, as the cost for the central bank was higher. Due to risk considerations relating to the volatility of the foreign exchange rate, foreign exchange debt typically accounted for 25-30 per cent of general government financing prior to the crisis. Consequently, the implicit interest¹⁶ paid on average on the debt by the state was closer to the developments in forint interest rates. The difficulties in the government securities market following the outbreak of the crisis led to foreign exchange borrowing from international organisations and thus to a considerable increase in the share of foreign exchange

¹⁶ For more details on the implicit interest rate, see: MNB (2013).

debt (close to 50 per cent). As a result, lower-interest foreign exchange loans took on a greater weight in the average implicit interest rate paid on the government debt. Thus, for example, the implicit interest rate on government debt in 2012 was some 1 percentage point below the level that would have prevailed if the state had maintained the 30 per cent foreign exchange ratio that had been typical previously. At the same time, the interest saving thus attained appeared only at the level of the budget. The increase in MNB bills outstanding as a result of the borrowing of foreign exchange and spending it in forints, led to a rise in the central bank's interest expenditures.

Compared to government securities issuance, saving at the level of the consolidated general government may have originated from the fact that – due to the maturity premium – the policy rate was typically lower than the yield on longer-term government securities (since early 2009, the average size of the difference has been close to 0.9 percentage points). It is also important to note that the lower interest rate is coupled with a shorter maturity, which adds to the interest rate risk of the debt. This is true because if a major increase in interest rates took place, the longer-term securities issued earlier could mean a generally lower interest cost over the entire maturity than the originally lower-cost MNB bill, whose interest rate might grow considerably in the meantime.

Shrinkage of the balance sheet

Interest loss is expected to decline, and then to disappear, in parallel with the shrinkage of the central bank balance sheet. In parallel with ongoing external financing capacity (followed by its slow decline), there may also be favourable developments in the level and maturity composition of gross external debt, which is a key indicator in terms of the vulnerability of the country (and thus in terms of the level of foreign exchange reserves). Accordingly, in relation to future changes in the MNB's balance sheet, it is assumed that foreign exchange reserves may decline over the longer term. In line with that, the sterilisation holdings may also decline. Therefore, gradual improvement is expected in the central bank's profit from interest, which constitutes a significant portion of the MNB's profit/loss. Against the background of declining foreign exchange reserves, this process is supported by the low forint-foreign exchange interest margin and the liability-side restructuring of the MNB's balance sheet as well as the increase in the share of non-interest-bearing cash within the balance sheet.

According to our forecast, over the longer term the central bank profit/loss may be around zero as a result of changes in the balance sheet structure. External equilibrium developments point to a contraction in the central bank balance sheet. At the same time, through the targeted support to the SME sector, the Funding for Growth Scheme (FGS) launched by the MNB increases the balance sheet total of the central bank. As the central bank is providing a preferential loan with a below-policy-rate interest rate, this involves a cost for the MNB due to sterilisation of the excess liquidity at the policy rate. Compared to the underlying

developments, it results in some deterioration in the expected profit/loss, but the expected benefits of the programme will presumably exceed the costs that arise at the central bank in a concentrated manner. As a result of the measure, the level of economic growth may be higher, which is favourable for economic agents in the private sector, while higher growth entails higher tax revenues for the state as well. Accordingly, on the whole, as was described in connection with the holding of foreign exchange reserves, in the case of the FGS it can also be said that while the costs appear in a concentrated manner in the balance sheet of the central bank, the expected benefits may improve the situation of the private sector and the financing position of the state budget.

Changes in the operating costs of the MNB

The operating profit/loss of the MNB has been relatively stable in the past years and only slightly contributed to the loss of the central bank. As presented above, the central bank's profit from interest and its exchange rate gain are primarily determined by the objectives and instruments of monetary policy as well as by market developments. Therefore, the central bank only has significant influence on costs related to its operation. These operating costs, which account for some 4-5 per cent of all expenses, resulted in only a slight loss in the period under review. In connection with the changes in operating costs, it is worth noting that nominal costs remained at a nearly unchanged level in the 2000s. This was, inter alia, attributable to the introduction of the 200-forint coin and the withdrawal of the 1- and 2-forint coins.

FISCAL EFFECTS, ACCOUNTING ISSUES

Accounting rules¹⁷

As the main rule, monetary movements due to transaction-related, so-called realised, profit/loss (for the year) appear in the budget deficit and in the debt as well, while government payments related to the revaluation of the reserves and due to the unrealised profit/loss are recorded only in the debt. Conducting monetary policy may influence developments in the general government as well, but the accounting rules are different in terms of the statement of the realised and unrealised profit/loss in the fiscal deficit and in the government debt. The previous year's realised profit/loss is added to retained earnings, and if the sum is negative, the loss must be reimbursed from the central budget up to the amount of the subscribed capital in such a manner that it increases both the deficit and the debt. If there is a profit, the ESA balance (fiscal deficit), which also serves as a basis for the Maastricht criterion, and the debt are reduced only by the payment of the profit from interest (less the operating

profit/loss), while the net income arising from exchange rate changes does not reduce the deficit.

Unrealised effects stemming from the revaluation of reserves appear in the individual revaluation reserves. The MNB Act contains the exact rules of the reimbursement of the loss on revaluation reserves.¹⁸ In the event that a payment obligation of the government arises due to these reserves, the disbursement does not add to the budget deficit. At the same time, government debt increases due to the financing requirement. The accounting is asymmetrical in the sense that in contrast to a realised exchange rate gain, an unrealised exchange rate gain cannot reduce government debt, as the positive revaluation reserve cannot be appropriated. The effects of central bank profit/loss on the budget are shown in detail in Table 1.

It is also important to emphasise that possible fiscal effects typically appear in the year following the emergence of the central bank profit/loss. In a favourable fiscal situation, the budgetary decision may be an earlier replenishment of the retained earnings (even before the emergence of a possible

Table 1
Schematic* rules of monetary movements owing to central bank profit/loss and their effects on the fiscal position

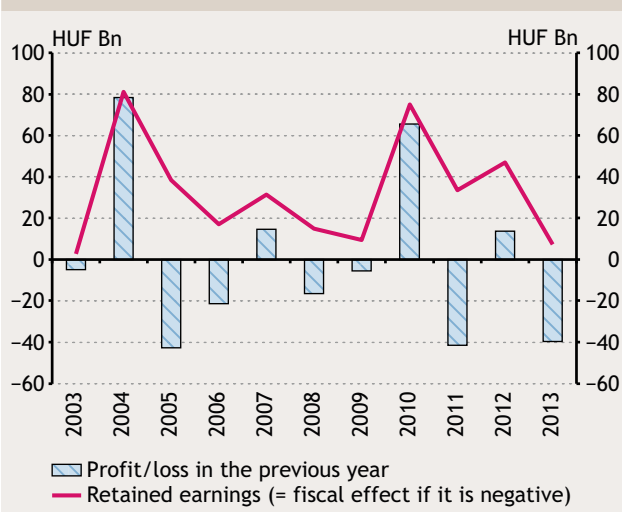
	Profit/loss (-realised profit/loss)			Unrealised profit/loss	
	↓			↓	
	Retained earnings			Revaluation reserves ([1] reserves of foreign currency securities [2] reserves due to exchange rate changes)	
	↓	↓		↓	↓
	If negative	If positive		If negative	If positive
	↓	↙ ↘		↓	↓
		Profit from interest	Realised exchange rate gain		
Budget deficit	Increase	Decrease	Not change	Not change	Not change
Public debt	Increase	Decrease	Decrease	Increase	Not change

* The chart only provides a schematic indication of the branches: footnotes 13 and 14 must also be taken into account for the exact accounting rules.

¹⁷ This chapter basically presents the statistical aspects of the fiscal accounting of central bank profit/loss. It is important to emphasise that profit/loss has a fiscal effect only if there are real monetary movements between the budget and the central bank. Accordingly, the emergence of central bank loss or profit is not enough; statistical accounting also requires that the budget actually recoup the loss or appropriate the profit in the form of a dividend disbursement.

¹⁸ Article 147 of Act CXXXIX of 2011 on the Magyar Nemzeti Bank exactly says the following: 'In the event that (...) the balance of the sum of the equalisation reserves is negative, and this negative balance exceeds the sum of the positive amount of the accumulated profit reserve and the balance sheet result, the central budget shall, by 31 March of the year following the subject year, make a direct cash disbursement to the accumulated profit reserve up to the level of negative balance that exceeds the positive sum of the accumulated profit reserve and the balance sheet result, i.e. in case of a negative balance of the profit reserve and the balance sheet result, up to the extent of the negative balance of the equalisation reserves, to be accounted for in the balance sheet in the subject year.'

Chart 7
Realised profit/loss and retained earnings between 2003 and 2013



loss), and thus the fiscal effect does not necessarily appear following the emergence of the loss.

Realised profit/loss and central budget reimbursement obligation

Between 2002 and 2012, the central bank's profit/loss fluctuated between HUF -40 billion and HUF +70 billion, but retained earnings always remained positive, and thus the central budget did not have any reimbursement obligation because of this. In the years around 2000, the central bank still had some profits, allowing dividend disbursement as well. After 2002, however, the central bank did not pay dividends to the budget. Retained earnings declined close to zero in 2003, then, in parallel with varying central bank profitability, they fluctuated between HUF 5 billion and 70 billion. This meant that the central budget did not have any reimbursement obligation as a result of loss-making operations, although dividends were not paid either. Over the medium term, the central bank balance sheet is expected to contract and the interest margin is expected to decline. Therefore, no loss is expected in the future either, i.e. the central budget will presumably not have any reimbursement obligation.

Unrealised profit/loss and reserve replenishment requirement

The loss not realised in the last ten years and changes in bond prices resulted in a total replenishment obligation of around HUF 70 billion for the central budget, affecting the developments in government debt as a financing item. The revaluation reserve of foreign currency-denominated securities fluctuated between HUF -25 billion

and HUF +45 billion in past years. Prior to the change in the relevant regulation in 2011, this meant that in some years the central budget had a replenishment obligation, as this type of revaluation reserve could not be combined with the revaluation reserve of the forint exchange rate. On the whole, between 2004 and 2011, when it became possible to combine the revaluation reserves, the replenishment obligation emerging as a result of an unfavourable change in securities prices represented a government debt effect of some HUF 70 billion. By the end of 2012, as a result of the loss on high-coupon bonds discussed in the previous chapters, the value of the revaluation reserve of the bond price dropped to minus HUF 30 billion. However, due to the new regulation (and the exchange rate revaluation reserve amounting to hundreds of billions of forints), this did not result in any reimbursement obligation for the central budget.

In the past ten years, the central budget did not have any reimbursement obligation because of changes in the exchange rate of the forint, which was attributable to the continuously depreciating exchange rate. In connection with the unrealised profit/loss the volatility of the revaluation reserve of the forint exchange rate is much more determining, while the losses stemming from bond price movements are much lower. In the past ten years, the revaluation reserve of the forint exchange rate fluctuated between HUF 0 billion and HUF 1,300 billion, as the exchange rate of the forint against the euro was either stable or depreciated after 2005.

Looking ahead, it is primarily forint exchange rate movements that may continue to determine changes in revaluation reserves. At the same time, in line with our current assumptions, we do not expect any central budget reimbursement obligation. Our forecast basically assumes a stable exchange rate, which means that the cost rate will gradually catch up with the currently presumed level, and thus the exchange rate gain may also decline gradually. In the event that changes in the exchange rate differ from the assumption, both the exchange rate gain and the reserve replenishment obligation may change. In an extreme case, an appreciation of the exchange rate may even result in negative revaluation reserves. At the same time, *ceteris paribus*, appreciation also reduces the value of government debt expressed in forints, because at present nearly half of the government debt consists of foreign currency-denominated securities and loans. This means that appreciation of the exchange rate reduces the value expressed in forints of these debt elements. Accordingly, while the reserve replenishment due to the revaluation reserve's turning negative adds to government debt, the foreign exchange part of government debt

declines as a result of the revaluation. However, this effect is asymmetrical, because depreciation adds to the value of government debt, while the positive exchange rate revaluation reserve cannot be appropriated from the central bank.¹⁹

CONCLUSIONS

In making its monetary policy decisions, the MNB primarily focuses on the achievement of the inflation target and the adequate amount of foreign exchange reserves for the sake of financial stability, while attempting to meet these objectives with the most favourable central bank profit/loss possible. At the same time, central bank profit from interest deteriorated considerably in the past years, reflecting the fact that during the crisis the difficulties in financing the budget and Hungary's increased foreign exchange reserve needs resulted in foreign exchange borrowing from international organisations. As a result, the central bank's balance sheet expanded, leading to a considerable rise in the central bank's interest loss, together with an increasing forint-foreign exchange interest margin. At the same time, this loss was broadly offset by an increase in the exchange rate gain, which is attributable to the relatively weak exchange rate, the foreign exchange auctions related to the early repayment scheme and the foreign exchange sales organised with the ÁKK. Over the longer term, in parallel with a contraction in the central bank balance sheet (and a decline in interest loss), the central bank's profit/loss may be close to zero. According to one of the most important findings of our article, in the past years, in parallel with an increase in central bank interest loss, the general government achieved savings, as a result of foreign exchange financing, which was cheaper than the forint interest rates. Accordingly, at the whole-economy level, a portion of the financing cost of the state emerges at the central bank, while savings are realised by the central budget. Similarly to that, the costs of the Funding for Growth Scheme also result in a slight increase in the MNB's interest expenditures, but at whole-economy level it is offset by the expected improvement in the financing situation of the private sector and the growing tax revenues stemming from the expected higher economic growth.

REFERENCES

- ANTAL, J. AND Á. GEREBEN (2011), "Foreign reserve strategies for emerging economies – before and after the crisis", *MNB Bulletin*, April.
- BALOGH, Cs. (2009), "The role of MNB bills in domestic financial markets. What is the connection between the large volume of MNB bills, bank lending and demand in the government securities markets?", *MNB Bulletin*, October.
- BARABÁS Gy., HAMECZ I. AND NEMÉNYI J. (1998), "A költségvetés finanszírozási rendszerének átalakítása és az eladósodás megfékezése. Magyarország tapasztalatai a piacgazdasági átmenet időszakában", [Hungary's experience in transition], *MNB Füzetek*, 1998/5.
- CZETI T. AND HOFFMANN M. (2006), "A magyar államadósság dinamikája: elemzés és szimulációk", [Dynamics of the Hungarian government debt: analysis and simulations], *MNB-tanulmányok*, 50.
- KOMÁROMI, A. (2007), "The effect of the monetary base on money supply – Does the quantity of central bank money carry any information?", *MNB Bulletin*, June.
- MNB (2012), *Monetary Policy in Hungary*, Magyar Nemzeti Bank.
- MNB (2013), "Kivetítés a költségvetési egyenleg és az államadósság alakulásáról (2013–2027)", [Projection for the changes in fiscal balance and government debt (2013–2027)], *Elemzés az államháztartásról*, február, Magyar Nemzeti Bank.
- PULAI, Gy. AND Z. REPPA (2012), "The design and implementation of the MNB's euro sale programme introduced in relation to early repayments", *MNB Bulletin*, June.
- ROCHA, R. R. AND F. SALDANHA (1992), "Fiscal and Quasi-Fiscal Deficit, Nominal and Real. Measurement and Policy Issues", *Policy Research Paper Series*, No. 919. The World Bank.

¹⁹ The accounting is also asymmetrical in terms of the debt rule that is included in the Fundamental Law, as the rule does not take into account the decline in government debt stemming from the appreciation of the forint, but does take into account the additional debt resulting from a possible replenishment of the revaluation reserve of the forint exchange rate.