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The adequate long-term earnings potential of the financial intermediary system is essential from the perspective of financial stability. Therefore, the impact of economic developments, e.g. monetary policy, on the profitability of the banking system is an important issue. Central bank interest rate cuts affect the profitability of the Hungarian banking sector through numerous channels. In our study, we provide an overview of the impact mechanisms relevant to the relationship between the central bank base rate and banks' profitability. We then proceed to quantify the impact of an interest rate reduction of 100 basis points on the profitability of the banking sector. According to our findings, the profitability effect over a two-year horizon amounts to HUF –26.9 billion (in other words, the average annual difference is HUF –13.4 billion) which, while not negligible, does not influence the monetary policy transmission materially. Since our calculations depend on the initial status of the macroeconomic environment, our results should not be applied automatically at any interest rate level.

POSSIBLE CHANNELS OF BASE RATE CUTS ON BANK PROFITABILITY

Lowering the key policy rate affects profitability through a number of direct and indirect channels. The most direct effect is perceived on banks' interest rates on forint-denominated loans and deposits.

According to the time series, interest rates on newly issued loans and new deposits follow changes in the key policy rate rapidly and to a great extent. As a result, the interest margin remains virtually unchanged with no direct effect on profitability.

As regards changes in the interest rates on the outstanding portfolios, overnight forint deposits comprise a substantial part of deposits. As interest rates on sight deposits are extremely low, they cannot be lowered in line with the key policy rate and therefore the deposit margin narrows. This is one of the most important negative effects of the interest rate cuts on profitability. The impact of the easing cycle on fixed interest rate deposits is similar, since in this case as well the interest rate margin moves in tandem with the central bank base rate. As regards variable rate deposits, the interest rate on the deposit tracks the key policy rate, leaving the interest rate margin unchanged which, therefore, does not affect profitability.

As is the case with deposits, loan products include both fixed and adjustable rate structures. In their case, the impact

mechanism of a key policy rate reduction is the same as in the case of deposit interest, however, it works in the opposite direction: while the lowering of the key policy rate does not influence profitability in the case of products with referential pricing, it improves profitability in the case of fixed interest rate loans. Subsidised housing loans comprise nearly one third of forint-denominated loans. Although the interest rate is fixed for a long term (at least 5 years) for borrowers, due to the subsidy system profitability is not affected substantially by interest rate cuts. Forint-denominated loans provided at market rates also include loans pegged to a reference rate. Likewise, profitability in their case is not affected significantly by the lowering of interest rates. Finally, fixed interest rate loans play an important role in the unsecured loan portfolio, and their profitability is affected favourably by the interest rate cuts.

Changes in bank lending and deposit rates can influence profitability not only through interest margins but also through the size of loan and deposit portfolios. The lowering of deposit rates may be accompanied by a decline in the deposit portfolio as households and corporations may shift their savings to instruments offering higher yields. This, however, means that the banking sector must replace private sector savings by other, more expensive funds, which has a negative effect on profitability. The lower the central bank base rate is reduced, the greater this effect may be. At the same time, the reduction of lending rates may increase the demand for loans which, through the disbursement of new, low-risk loans, increases the performing loan portfolio and improves banks' loan portfolio

* 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.

and profitability. At present, this channel is weakened by several effects in the Hungarian economy: households' high indebtedness, cautious consumer behaviour and a lack of confidence in banks are keeping households' demand for loans at a steadily low level while interest rates are falling. As regards the corporate segment, the Funding for Growth Scheme (FGS) accounted for a substantial part of new loans in the second half of 2013, and since the interest rate on loans issued in the context of the FGS is independent of the central bank base rate, its impact on the loan demand of the SME segment was more predominant than changes in the key policy rate.

Apart from the loan and deposit portfolios, changes in the central bank base rate also influence the profit or loss deriving from the rest of the balance sheet items. Of these items, the two most important channels deserve special attention: the revaluation yield stemming from the price change of certain assets (e.g. government papers), and potential revenues from open FX positions. Owing to the balance sheet structure and FX position of the Hungarian banking sector, an interest rate reduction exerts a positive effect through both of these channels.

Besides the channels mentioned so far, the central bank base rate influences bank profitability through the real economy and through exchange rate developments as well. An easing cycle helps improve the domestic outlook for economic activity, increases investment and employment and facilitates, through a weaker exchange rate, export growth. On the one hand, growth in investment and production boosts corporate credit demand, and on the other hand, the profitability of corporations improves which, in turn, reduces the risk of default. At the same time, the weaker exchange rate increases debt servicing burdens, which has the opposite effect (particularly in the case of non-exporting companies indebted in foreign currency) on loans' probability of default. As production grows, employment and the disposable income of households both increase, which spurs household demand for credit and increases the number of creditworthy households, thereby improving profitability. Apart from the above, interest rate cuts affect the performance of loans through two additional channels. In the case of loans pegged to a reference interest rate, lower rates translate into smaller instalments and hence, they improve portfolio quality. This, however, is less typical in the case of the household portfolio. A potentially weaker exchange rate resulting from an interest rate reduction deteriorates the performance of foreign currency debtors, which imposes losses on the banking sector as well. At present, the larger part of the household portfolio is still denominated in foreign currency. Taken together, therefore, it is not entirely clear whether the quality of the

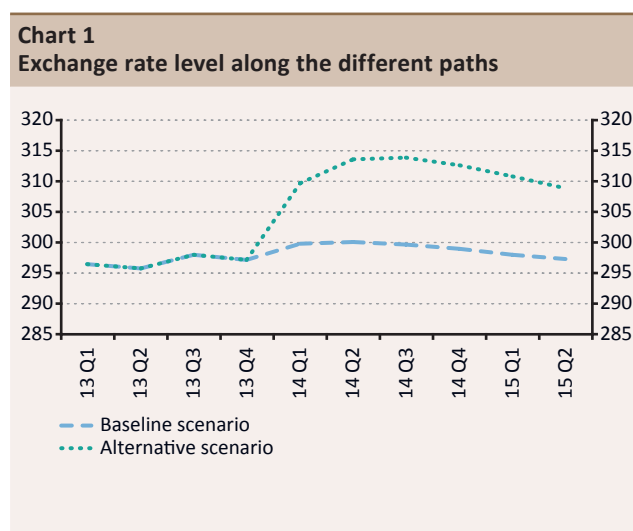
loan portfolio improves or deteriorates in the wake of an interest rate reduction.

The improvement in economic activity may raise the value of real estate serving as collateral which, through the decline in LGD,¹ mitigates loan losses. However, the continuing decline in house prices suggests that a more pronounced improvement is required in economic activity for there to be an increase in collateral values. In the case of foreign currency debtors, the weakening of the exchange rate may be accompanied by an increase in LGD, as the exchange rate change – as opposed to outstanding principal – does not increase collateral value expressed in HUF. Since a significant portion of indebted households have foreign currency loans, in the context of a weaker forint exchange rate, interest rate cuts may deteriorate the quality of the household portfolio, despite the improvement in economic activity.

The changes induced by the central bank base rate in the income position of the banking sector also have an impact on the income position of other sectors. Owing to the lower interest rates on deposits and loans, lowering the key policy rate undermines the income of net savers, while it improves the income position of net borrowers. A lower base rate might improve the general government balance via net interest expenditure. Owing to the key policy rate, the lower debt service burden improves the income position of forint debtors, while higher instalments in the context of the weaker exchange rate deteriorate the income position of foreign currency debtors.

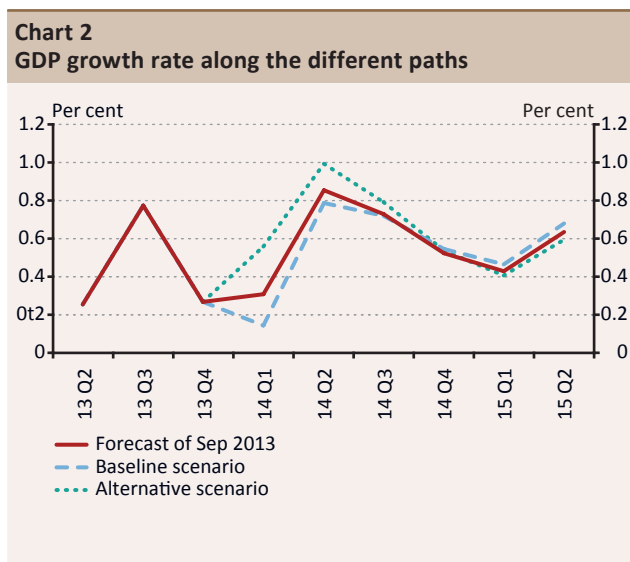
QUANTIFICATION OF THE EFFECTS

In order to assess the impact of the easing cycle, we applied the central bank stress test (Banai et al., 2013) and considered



¹ LGD (loss given default): the ratio of losses on defaulting loans to outstanding principal.

the period lasting until 2013 Q2 to be the review period. In the baseline scenario, we simulated the effects of a monetary policy which, following an easing cycle lasting until 2013 Q2, keeps the key policy rate unchanged across the entire forecast horizon. In comparison, in the alternative scenario



the key policy rate remains 100 basis points lower over the two-year forecast horizon. The macroeconomic scenarios were generated by means of the MPM model (Szilágyi et al., 2013), i.e. the model used for generating the forecasts presented in the MNB's *Report on Inflation*. According to the model, such a monetary policy would weaken the exchange rate by around 4 per cent, while the growth rate of GDP would accelerate over the short term before adjusting somewhat during the second year (however, in terms of its level, the evolving GDP path would be consistently higher in the context of looser monetary conditions). (Charts 1 and 2 present the two macroeconomic scenarios and, in the case of GDP growth, the MNB's official September 2013 forecast is shown. The baseline scenario indicates the original values, while the alternative scenario displays the values associated with the lower central bank base rate).

Thus, the difference between the profits of the banking sector in the two scenarios indicate the extent of change in the profitability of the banking sector induced by the additional, long-term interest rate cut amounting to 100 basis points which took place after 2013 Q2.

For the purposes of this exercise, we applied most of the assumptions typically used for stress tests, but due to the special circumstances involved, we changed the assumptions in some cases. In forecasting profitability, we had previously used the assumption that lending and deposit rates remain

unchanged over the forecast horizon. Since in our case it is vital how soon and to what extent the lowering of the key policy rate is reflected in lending and deposit rates, we bore in mind that, from the aspect of repricing, the interest rates of the different portfolios track changes in the central bank base rate to different degrees. In view of our experiences so far (and also in consideration of banks' balance sheet structure), we now relied on the following assumptions: of the 100 basis point interest rate cut only 75 basis points are reflected in the interest rates on household deposits and 25 basis points are reflected in corporate deposit rates, while lending rates fully follow the changes in the key policy rate. In respect of revaluation resulting from asset price changes, we assumed that only assets maturing within two years would be revalued. We left the forecasting methodology of loan losses and the rest of the assumptions unchanged.

By taking account of lending and deposit rates as described above, through the profitability model we can measure the direct impact of the key policy rate on lending and deposit margins. The stress test is prepared on the assumption of a static balance sheet; therefore, the initial deposit and loan portfolios are revalued only to reflect the exchange rate change both in the baseline scenario and the stress scenario. We have no reliable estimate on how the deposit portfolio changes in response to the key policy rate. As regards the loan portfolio, a substantial increase would have to take place in order to improve profitability significantly (which, in view of households' precautionary attitude, is highly unlikely). This may justify the selection of the typically applied static balance sheet. In the case of loans to households, we generally assume unchanged house prices (and thus, collateral value) when calculating the LGD figure. Compared to housing market developments, this – presumably – is an optimistic assumption; therefore, it would not be justified yet to use a more positive house price path resulting from the interest rate cut. Consequently, we do not expect an increase in the collateral value of household loans. The beneficial effect of the improvement in economic activity is reflected, through GDP, employment, exports and consumption, in household and corporate PD² and LGD estimates, resulting in a more favourable portfolio quality. Similarly, the effect of the exchange rate and interest rates on instalments is quantified through PD estimates.

FINDINGS

The effect through changes in lending and deposit rates is primarily reflected in the decreasing interest income from sight deposits. According to our estimates, the difference observed between the two scenarios amounts to HUF 28.2

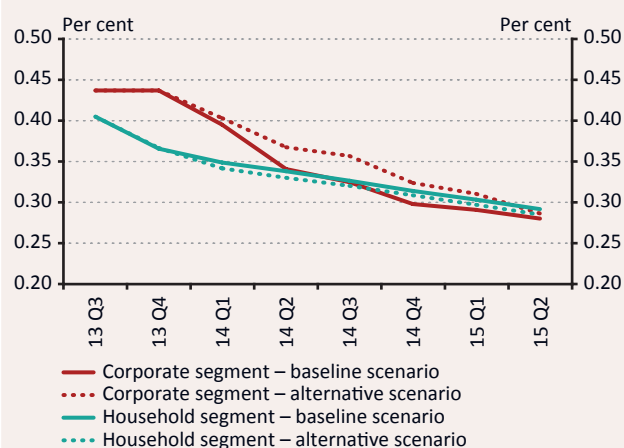
² PD: probability of default.

billion over the entire two-year horizon; in other words, as a result of declining interest income, a 100 basis point reduction of the key policy rate reduces the profitability of the banking system by HUF 14 billion on an annual basis.

As a result of open exchange rate positions, a 4 per cent weakening of the exchange rate generates a HUF 1.3 billion positive valuation effect over the two-year horizon.³ At the level of the banking system, a 100 basis point interest rate cut would translate into a HUF 10.3 billion profit through the repricing of asset side items.

Both in case of the corporate portfolio and the household portfolio, the weaker forint exchange rate resulting from the lower key policy rate initially increases the ratio of non-performing loans and the expected loan loss at default. In the first few quarters this effect is only offset by the smaller instalments attributable to the lower interest rate but, over the long term, also by the stronger economic activity (the effect of which materialises with a lag). As a net result of the above, loan losses on the corporate portfolio prove to be higher along the path assuming a lower central bank base rate (especially in the first year of the two-year period) before they gradually start approaching the values of the baseline scenario (Chart 3).

Chart 3
The cost of provisioning as a percentage of the portfolio



With a lower central bank base rate, credit risk developments are slightly more favourable in the case of the household portfolio over nearly the entire horizon. (The latter can be largely attributed to the exchange rate cap, which protects a large part of foreign currency debtors from the instalment increase generated by the exchange rate change. Accordingly, the exchange rate effect is more moderate in the household

portfolio than in the corporate portfolio). The difference between the two paths is relatively small in comparison to total loan loss (Charts 4 and 5). With the lower key policy rate, the loan loss realised on the corporate portfolio is higher by HUF 10.8 billion over the entire two-year horizon. During the same period, the losses on loans to households are slightly smaller (by approximately HUF 0.5 billion) along the path featuring the lower key policy rate.

Chart 5
Loan loss on the household portfolio

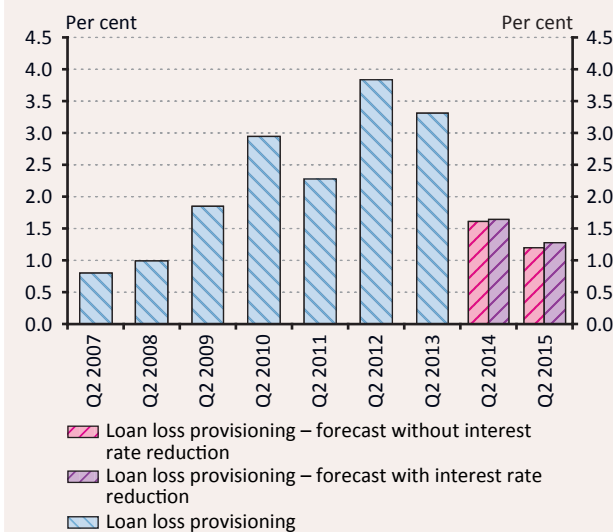
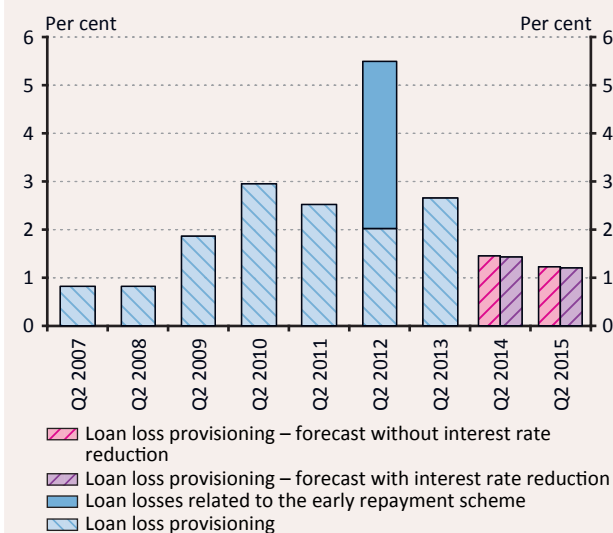


Chart 4
Loan loss on the corporate portfolio



Besides the main channels mentioned so far, during the comparison of the scenarios we incorporated some additional, less important effects or those of a technical nature. These include, for example, the loss incurred by banks as a result

³ We disregarded the potential impact of open positions deriving from foreign investments.

of the exchange rate cap in the case of the weaker exchange rate; the profit-reducing effect of impairment on the local government portfolio; and the difference in tax liability due to the different pre-tax income. With the lower key policy rate, the loss incurred by banks is HUF 3 billion higher owing to the exchange rate cap; however, as a result of the lower pre-tax income, the tax liability of banks is HUF 3 billion lower. The profit-reducing effect of impairment on the local government portfolio, in turn, is negligible. Taken together, the three effects reduce banks' income by a mere HUF 0.1 billion over the two-year horizon.

Table 1 sums up the difference between the most important effects along the two paths. According to the results, over the two-year horizon the lower key policy rate reduces banks' profitability (i.e. reduces it by a total of around HUF 42 billion) through interest revenue, the loan loss on the corporate portfolio and the exchange rate cap, but improves it (i.e. by around HUF 15 billion) via the price changes of asset side items, revenues from open exchange rate positions, the loan loss on the household portfolio and the lower tax liability. Overall, a long-term, 100 basis point reduction of the central bank base rate reduces the profit of the banking sector by a total of HUF 26.9 billion over the span of two years.

Table 1
Difference between the two paths broken down by main channels

	Difference (HUF billions)
Income without loan loss	-28.2
Revaluation of assets	11.7
Loan loss on the corporate portfolio	-10.8
Loan loss on the household portfolio	0.5
Other (exchange rate cap, corporate income tax, etc.)	-0.1
Total	-26.9

It should also be noted that banking sector figures may mask heterogeneity at the individual level: changes in loan losses may be negative mainly for banks with a higher ratio of foreign currency loans in the portfolio, while declining lending rates tend to have a more pronounced positive effect on the portfolio of banks providing forint loans. Among the large banks, the largest loss amounts to HUF -7.4 billion. Finally, in evaluating our results it is important to bear in mind that the profile of the macro path used in our example is not independent of the initial state.

CONCLUSIONS

The lowering of the central bank base rate affects bank profitability through a number of channels (disregarding banks' possible adjustment). Interest rate cuts have an impact on banks' profits through changes in net interest income, the repricing of certain assets and liabilities or the performance of the loan portfolio. In addition to providing a detailed presentation of this impact mechanism, in our study we also quantified this effect based on our stress testing framework. We found that, at the system level, the profitability effect of a 100 basis point interest rate cut is HUF -26.9 billion over the span of two years; i.e. the easing cycle reduces banks' result by HUF 13.4 billion annually. While not negligible, this amount is not expected to pose a substantial risk to stability. Since our calculations depend on the initial status of the macroeconomic environment, our results should not be applied automatically at any interest rate level.

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