Analysis of the impact of monetary policy on interest reciepts and expenses of enterprises and households

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Monetary policy, through its interest-rate component (real interest rate), affects the decisions that economic entities take in regard to savings, consumption and investment. Where a change in the central bank's official interest rate is passed on relatively quickly to customer rates, it can have a direct effect on the financial position of economic agents. When interest rates go up, economic agents spend more on loan interest, while their interest income from deposits also increases. A reduction in rates has the opposite effect. In this way, depending on whether fixed rates or variable rates are prevailing in the economy, monetary policy can in relatively short time affect the income and expenses of economic agents. The article focuses on this issue in the context of the Slovak economy. The aim is to examine the effect of nominal rate changes on the interest income and expenses of enterprises and households and on the average interest rate (from the outstanding amount of loans and deposits) which is one of the determinants of that income and expenses. Included in the analysis are data on interest expenditure and receipts of banks, which represent interest income and expenses from the view of enterprises and households.[1] The period under review ends in 2005.

DATA – ISSUES AND IMPLICATIONS

Data on interest income and expenses have the character of flow quantities. For the purpose of further processing, these data were annualized to give a better comparison with the stock quantities (e.g. with the volume of loans or deposits).

The amount of interest expenses or interest reciepts is generally a function of both the relevant interest rate and the volume of deposits or loans. When analyzing the effect of the interest rate on interest expenses and income, these data need to be adjusted so as to eliminate the effect of volume. A suitable approach is to calculate the so-called implicit interest rate on the basis of the amount of interest expenses or reciepts and the corresponding amount of deposits and loans. Such a rate should, in theory, correspond to the reported average lending and deposit rates. The comparison between implicit interest rates and those actually reported provided substantial confirmation of correspondence.

It is clear from the charts that the implicit interest rate is more volatile than the reported interest rate, especially in the years 1995–2000 (in particular, regarding corporate deposits and household loans). This probably reflects seasonality in the reporting of interest expenses and reciepts, as well as the fact that the reported average inter-

1 The interest receipts of banks represent interest expenses of enterprises or households, while the interest expenditure of banks represents interest income of enterprises or households.

Chart 1 Interest expenses, the implicit interest rate and the interest rate on the outstanding amount of corporate deposits

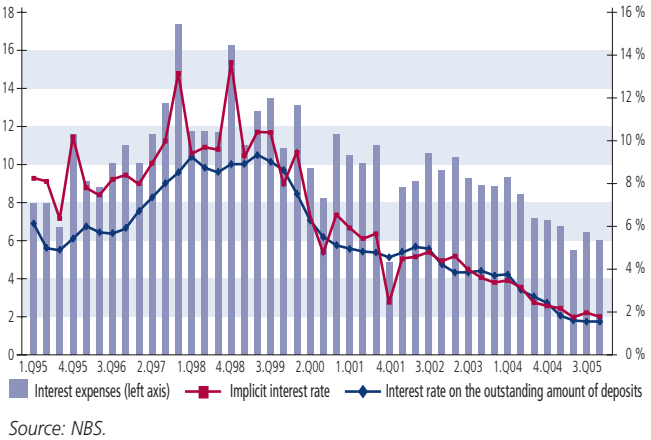
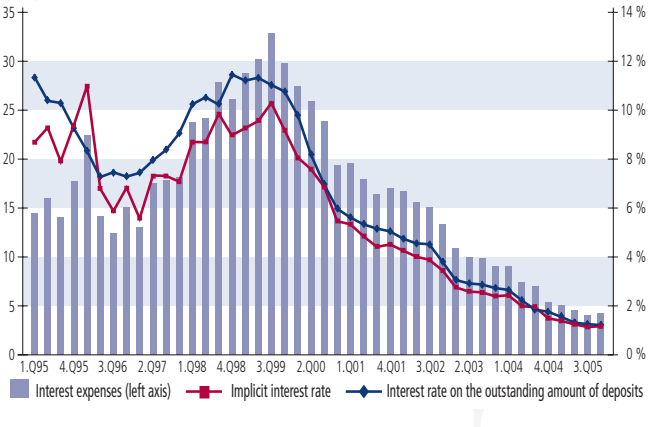


Chart 2 Interest expenses, the implicit interest rate and the interest rate on the outstanding amountof household deposits



Source: NBS.

Chart 3 Interest reciepts, the implicit interest rate and the interest rate on the outstanding amount of corporate loans

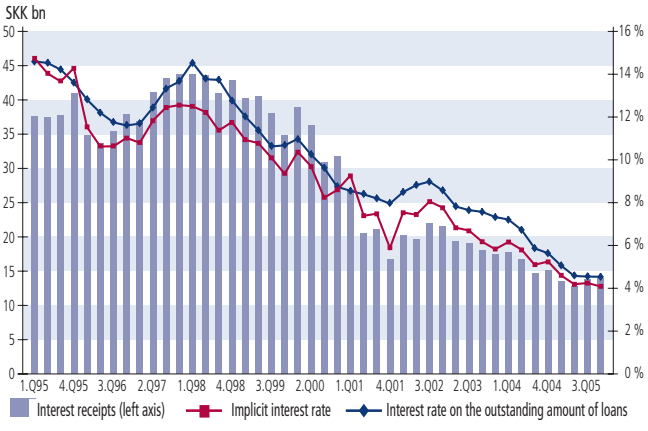


Chart 4 Interest reciepts, the implicit interest rate and the interest rate on the outstanding amount of household loans

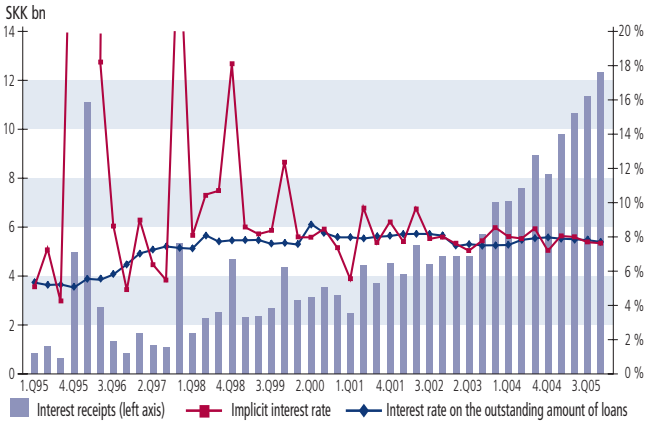


Chart 5 Corporate and household lending (outstanding amount)

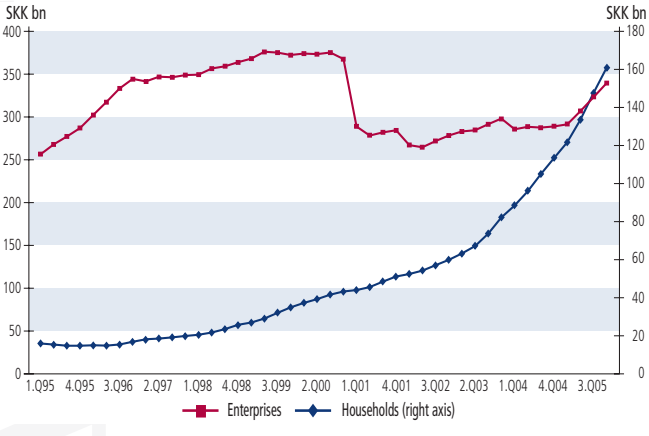
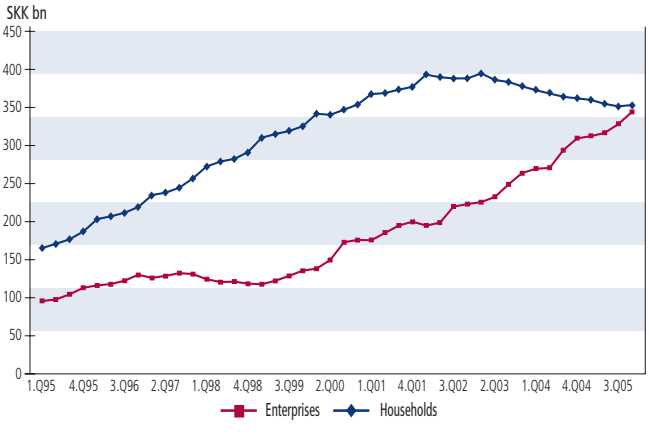


Chart 6 Corporate and household deposits (outstanding amount)



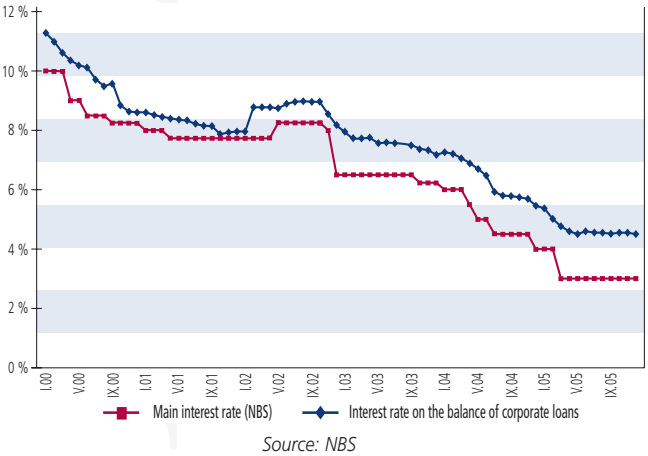
est rate constitutes, as its definition suggests, a time series in which volatility is eliminated. For the purpose of further analysis, it is better to use instead of implicit interest rates, average lending and deposit interest rates.

As for how the amount of deposits or loans affects interest expenses or reciepts, it is apparent, in particular with household lending, that the interest rate was not a factor behind the increase in interest income over the later years. It was determined by growth in the volume of loans, while the interest rate stagnated.

Unlike household lending, the volume of corporate loans did not significant affect the development of interest receipts. Except in 2000 and to a lesser extent in 2001, when loans volume fell substantially as a result of restructuring of the credit portfolio, the development of interest reciepts was largely determined by the interest rate.

Also as regard the deposits, the amount of

Chart 7 Interest rate on the outstanding amount of corporate loans and the NBS's main interest rate



Source: NBS

Chart 8 Interest rate on the outstanding amount of household loans and the NBS's main interest rate

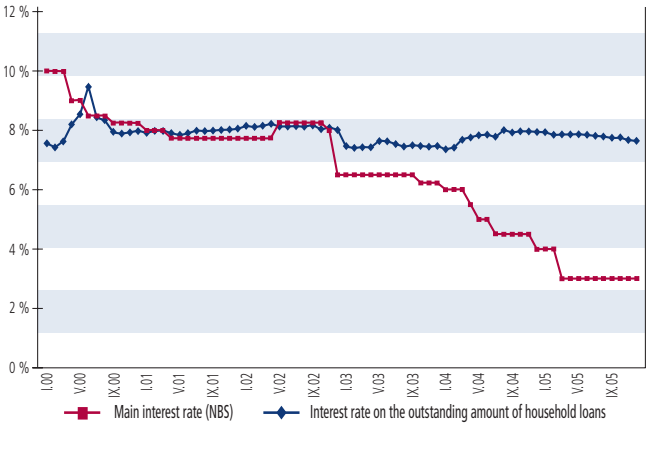


Chart 9 Interest rate on the outstanding amount of corporate deposits and the NBS's main interest rate

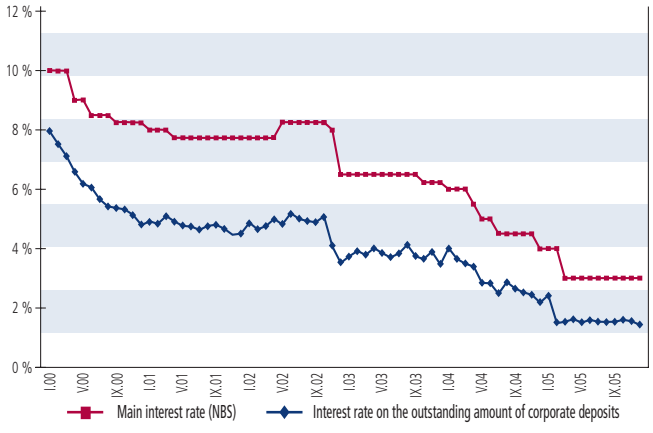
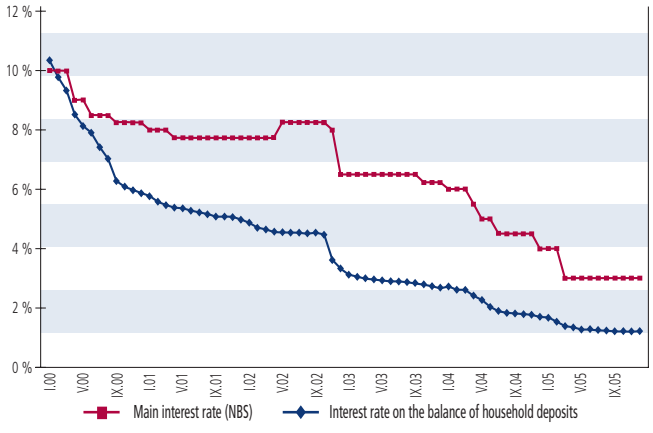


Chart 10 Interest rate on the outstanding amount of household deposits and the NBS's main interest rate



Source: NBS

interest expenses reflected mainly the interest rate development, while the volume of deposits was gradually growing. In the case of both enterprises and households, interest expenses clearly responded to the increase in interest rates in the period 1997 to 1999. The amount of interest expenses subsequently fell along with the decline in interest rates. As regards household deposits, this development was supported after 2003 by the decrease in their volume. By contrast, corporate deposits recorded relatively sharp growth.

As the previous charts show, interest receipts and interest expenses were, except in regard to household lending, largely determined by interest rates. The effect of monetary policy on the amount of interest expenses or receipts is therefore related to the central bank's ability to influence the average interest rate on the balance of deposits and loans. Charts 7 to 10 show the relatively sensitive reaction of average interest rates for clients to a change in the NBS's official rate (household lending excepted).

QUANTIFICATION OF THE PASS-THROUGH OF CHANGES IN THE NBS'S KEY RATE INTO AVERAGE LENDING AND DEPOSIT RATES

In order to confirm the chart-based interpretation, we applied the econometric model ECM (error correction model) to the period 2000–2005. The theoretical assumption that the econometric estimate was intended to confirm was that, the long-run elasticity of the pass-through of the NBS's key interest rates into average lending and deposit rates should be one. The model was also expected to explain that the lending rates fluctuate above the NBS's base rate and deposit rates below it. For simplification, this interest rate differential is assumed to be stable in time and therefore, assuming unit long-run elasticity, that it should be explained by the estimated constant.

The estimated long-run elasticities indicate that the NBS's key rate had a relatively significant effect on the corporate lending rate and the deposit rate in the corporate and household sectors. However, the hypothesis of unit long-run elasticity was not confirmed (this hypothesis was rejected in all cases). At the same time, the explanatory ability of the estimated parameters may be distorted by the fact that key interest rates were raised only once during the period under review (January 2000 to December 2005), and therefore the estimated elasticities express more a sensitivity to rate reductions and do not take account of any potential asymmetry in case of rate hikes. As expected, the impact of the NBS interest rate on the average household lending rate appears to be insignificant (that is why it is not analysed further on in article).

In ur case the model has the following specification:

$$d(ir) = \gamma[ir_{-1} - \beta * rate\_2t_{-1} - \mu] + \pi_1 d(ir)_{-1} + \pi_n d(ir)_{-n} + \pi_{n+1} d(rate\_2t)_{-1} + \pi_{2n} d(rate\_2t)_{-n},$$

where:

ir – the lending rate or deposit rate (from outstanding amount) in the corporate or household sectors,

$rate\_2t$ – the NBS's two-week REPO tender limit rate (note: between January 2000 and May 2000 it is approximated by the average overnight refinancing and sterilization rate),

γ – the adjustment coefficient,

β – the long-run elasticity coefficient,

π – the short-run elasticity coefficient,

μ – the cointegration constant,

d – the first difference.

Estimated values of individual parameters

	γ	β	μ
Loans - corporate	-0.27	0.85	1.76
Loans – household	-0.34	0.07	7.40
Deposits – corporate	-0.25	0.67	-0.80
Deposits – household	-0.05	0.58	-1.32

The signs of the constants are in line with the theoretical assumptions that they should explain the interest rate differential between client interest rates and the NBS rate. In the case of corporate lending rates, the value of the constant is approaching the long-run average of that interest rate differential in Slovakia, the euro area, the Czech Republic and Hungary.[2] But given that long-run elasticity is not unit, this constant does not ensure that the interest rate differential will be constant and positive.

With the exception of equation for corporate lending rates, the recursive coefficients show considerable instability. Regarding equations for corporate and household deposit rates, however, these coefficients indicate that the adjustment coefficients and long-run elasticities are steadily rising. This may suggest a rising sensitivity to changes in NBS rates in the future.

POTENTIAL IMPLICATIONS FOR MONETARY POLICY

Although the pass-thorugh of NBS rate changes into customer rates was not quantified statistically, it may be concluded from the chart analysis and from the partial results of the econometric analysis that there is a relatively strong impact on selected interest rate aggregates, with the exception of household lending rates. The almost constant development in household lending rates is to a large extent related to their purpose structure and its development, the rising risk in the credit portfolio, but probably also the asymmetric/disproportionate reaction of the banking sector to changes in official rates. This does not necessarily mean, however, that monetary policy, through the price of lending, does not have any influence on the household sector.

From the monetary policy point of view and the potential implications for the future, an important aspect is ability of central bank to influence both sectors – corporate and household – through interest rates.

In case of both, enterprises and households, the volume of koruna deposits exceeds the volume of koruna loans. Each sector is therefore a net lender to the banking sector (the net position, as the difference between loans and deposits is negative). Assuming a perfect reaction of client interest rates (for both deposits and loans), an increase in the NBS interest rate would see that, at the aggregate level for both sectors, the interest income from deposits would rise in absolute terms by more than the loan interest expenses.

In the case of the corporate sector, the relatively stable level of the interest rate differential (Chart 13) between loans and deposits from 2000 indicates that the reaction of lending and deposit rates is relatively symmetrical, but an evaluation of the impact on the corporate sector must also consider the position of individual enterprises in terms of size. For example, it may be assumed that only large enterprises (often foreign direct investment enterprises) have substantial deposits and that therefore their sensitivity to koruna rates need/might? not be significant. The position of these enterprises is sufficiently strong that they can be relatively flexible in converting their debt to a foreign currency. It is rather small and medium-sized enterprises that will be affected by a shift in interest rates since borrowing is for them a significant source of financing

2 Beka, J., Čársky, R.: Lending to non-financial corporations and related credit conditions; BIATEC, no. 2/2006.

Chart 11 Stock of loans and deposits and the net position of enterprises

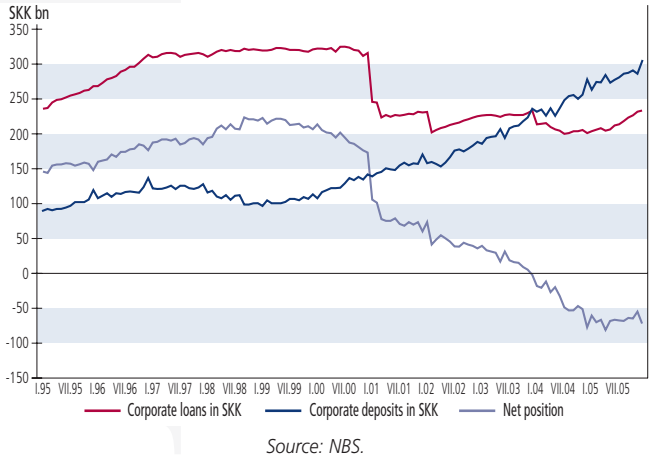
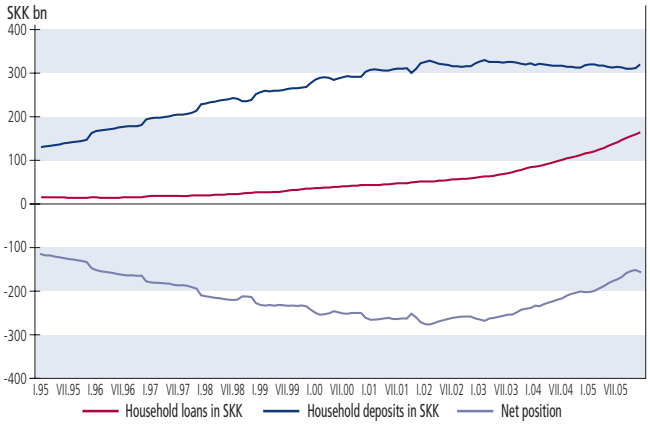


Chart 12 Stock of loans and deposits and the net position of households



Source: NBS.

and is only to a small extent covered by deposits. It is also necessary to consider the discrepancy in time structure of corporate loans and deposits. Whereas corporate koruna loans predominantly have a maturity of more than 1 year (accounting for 54% of the total amount of SKK loans), the majority of koruna deposits mature in less than one year (99%).

In regard to households, however, the level of the interest-rate differential (Chart 14) between loans and deposits recorded a relatively sharp increase from 2000. The widening of this differential suggests an asymmetric/disproportionate reaction of the banking sector to changes in key interest rates. While average lending rates stayed flat, deposit rates declined significantly. The development of net interest reciepts (the difference between net interest expenses and reciepts) substantially mirrored that of the interest rate differential.

As for the reaction of deposit rates to interbank rates (approximating the movement of official rates), it may be seen from Chart 15 that for households, unlike enterprises, banks reflected the downward shift in interest rates to a more considerable extent. In recent years, however, banks reduced corporate deposit rates more substantially. When interbank rates increased, however, corporate deposits rates also rose while household deposits rates continued to decline.

It also necessary to note that the almost zero reaction of household lending rates to the NBS's official rates is to a large extent related to the purpose or product structure of the loans. Whereas in the past households borrowed almost exclusively from building societies (which also now account for around one-third of the loans outstanding) with the loans characterized by a practically fixed interest rate (contributing to rigidity in interest rates from the outstanding amount), in recent years there has been a sharp rise in other forms of loans for housing (for example, mortgages), as well as consumer loans. In regard to the fixing of interest rates in new contracts, flexible rates are prevailing (the proportion of new contracts that include a variable rate and initial fixed rate of up to 1 year rose from 73% in 2004 to 81% in 2005), while rates on new loans (newly signed contracts, reported since 2004) indicates a reaction to movements in official rates (Chart 16). Although this fact has not yet been reflected in interest rates from the outstanding amount, it is clearly affecting structure of loans and demand for loans expressed in the growth

Chart 13 Net interest reciepts of banks and the interest rate differential in the corporate sector

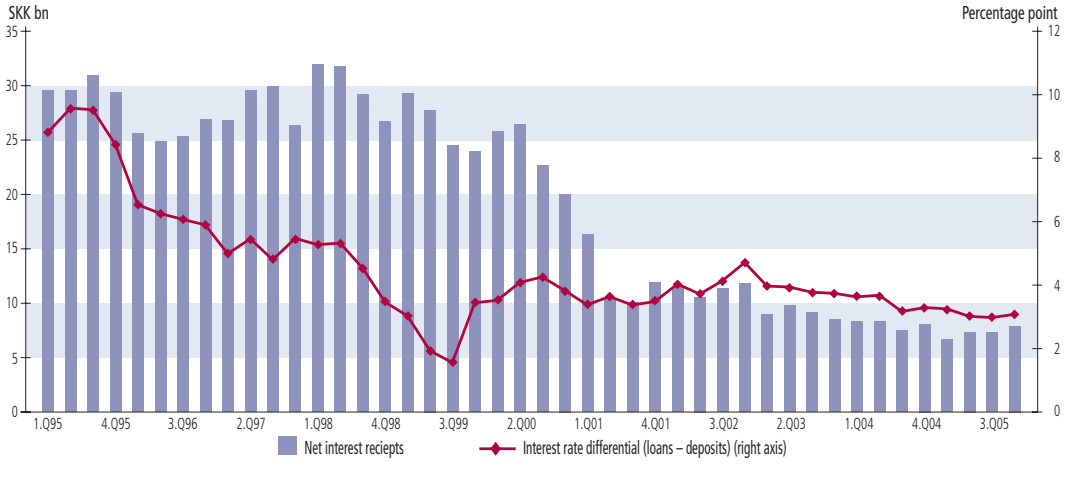
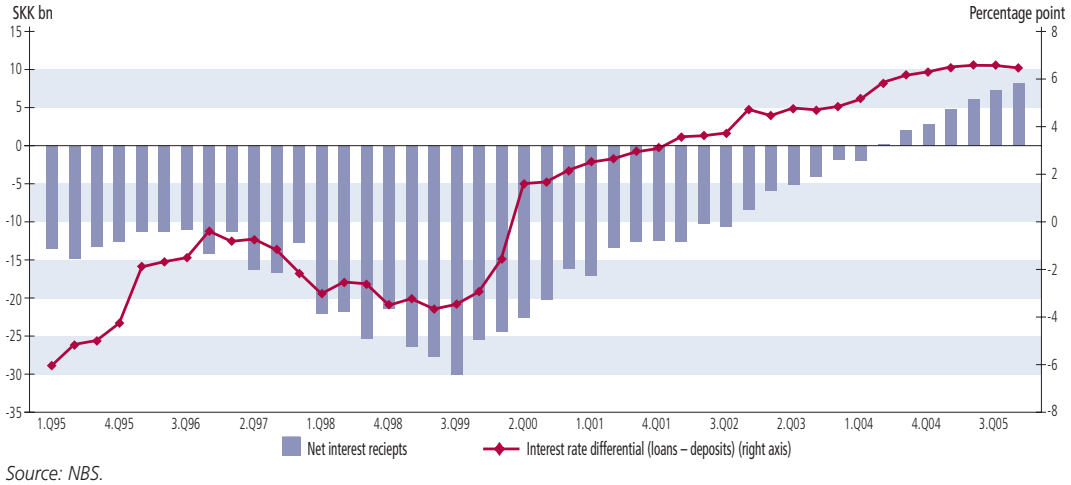


Chart 14 Net interest reciepts of banks and the interest rate differential in the household sector



Source: NBS.

Chart 15 Year-on-year changes in corporate and household deposit rates and the 3-M BRIBOR

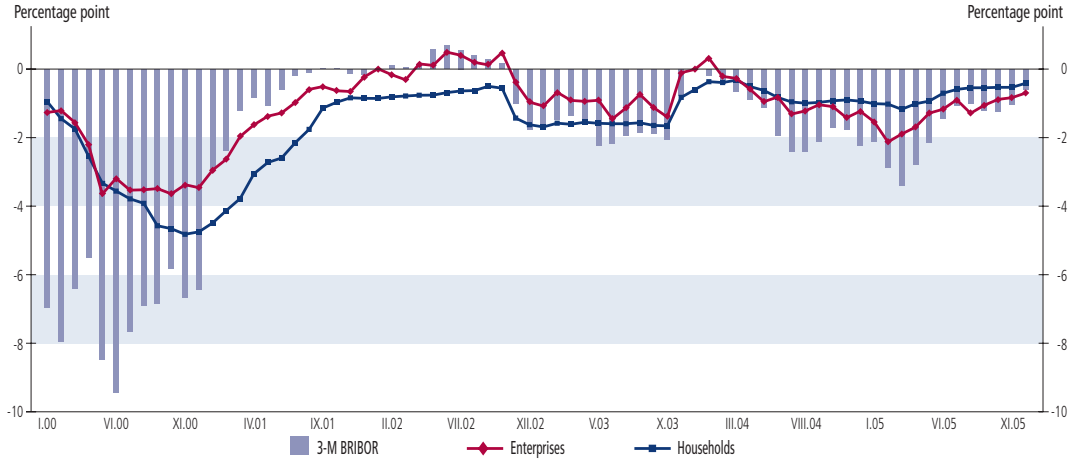
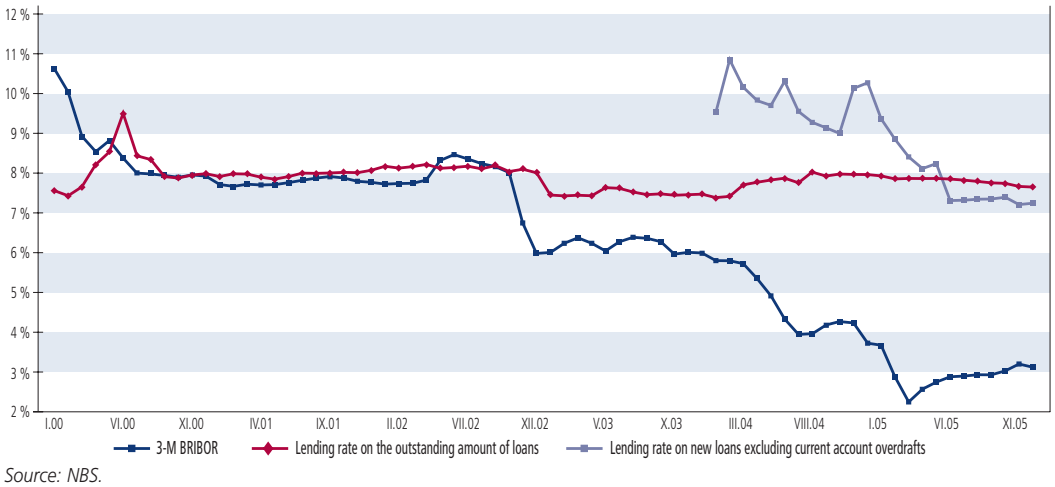


Chart 16 Households lending rate on the outstanding amount of loans and on new loans, and the 3-M BRIBOR



Source: NBS.

of their volume. In future, this should also be seen in a more sensitive reaction of average household lending rates (from outstanding amounts).

If the flexibility of household lending rates increases as indicated, it may be assumed that monetary policy will have a gradually greater effect on the interest income and expenses of households.

Conclusion

Although the econometric analysis of the pass-throug of NBS's official interest rate into average client interest rates from outstanding amounts did not bring explicit results, the partial results of the econometric estimate and chart-based analysis support the assumption of monetary policy having a relatively significant effect on that rates and on the development of interest expenses and reciepts. This impact is particularly apparent with corporate loans and deposits, although the real impact of monetary-policy decisions may be assumed to fall mainly among small and medium-sized enterprises, which are not financed by a foreign owner.

In the household sector, the pass-through effect of monetary policy on lending rates appears to be ambiguous. It should be noted, however, that client interest rates from outstanding amounts are affected by accumulated loans from previous years, most of which carry a fixed interest rate. But within the lending structure, there is a gradual shift towards flexible rate loans, which increases the central bank's ability to influence the household sector through its decisions. The shift from fixed rate products to variable rate products results not only from the marketing strategy of commercial banks but also from the favourable inflation expectations, which are formed by the central bank. The downward rigidity in average household lending rates may also be connected with the rising risk of credit products (in particular, consumer loans). That means however, that with the rising amount of such products the upward reaction of client interest rates should be relatively significant.

Overall, it may be said that in the rapidly changing economic and monetary environment it is difficult to identify the exact quantitative relationships. A look at the structure of the issue as a whole does, however, indicate that monetary policy is increasingly able to affect the economy.