



# Impact of the loan-to-value policy of Slovak banks on losses under scenario of falling real estate prices

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*Growing importance of mortgage lending in the Slovak banking sector has been observed since the restructuring and privatization of banks in the late 90s. In this relatively short history, housing loans turned out to be an important source of robust interest income essential to banking sector stability. However, housing loans were also closely related to excessive growth of the housing market in 2006–2008, and loan loss provisioning that followed the burst of the bubble in 2009 hit the profitability of banks. Therefore, the Slovak housing market and related lending policies of banks are indispensable to any macro-prudential analysis in this region.*

<sup>1</sup> Data were obtained from the Eurostat databases.

## BACKGROUND AND MOTIVATION

Before the debt crisis broke out, most of the EU countries had witnessed spectacular growth of housing loans fuelling local real estate markets. In most of the cases, housing markets had moved away from their long term equilibrium and both banks and households became more vulnerable. After the corrections in real estate prices in 2008–2009 lending activity slowed. Despite falling interest rates and more favourable ratios between real estate prices and average wages, both banks and households became more cautious. Labour market uncertainty became the prominent factor of lending activity.

Even if conditions in different countries remain heterogeneous, the situation in Slovakia warrants special attention. Compared to other euro area countries, housing loans in Slovakia are

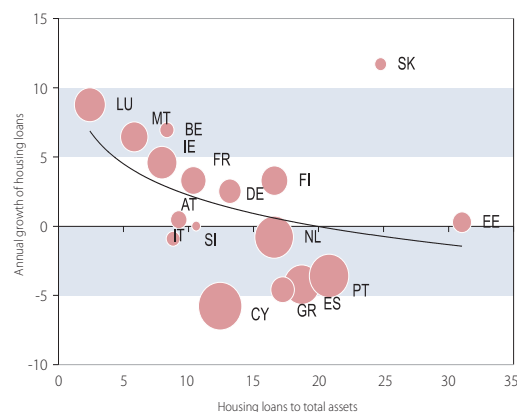
growing at the fastest pace despite their already high share in total assets. This phenomenon is usually explained by the currently low saturation of the lending market expressed by the relatively low share of housing loans in the GDP. However, this explanation is probably not complete and fairly superficial as there are also some other countries with reasonably low indebtedness of households which do not report any growth of housing loans. Moreover, credit growth should be always analysed against the background of the labour market, which was particularly hit in Slovakia. Already such a brief and shallow overview clearly calls for a deeper analysis of the vulnerability of the local banks engaged in mortgage lending.

## METHODOLOGY

Looking at the housing loan business, banks typically incur losses due to a combination of two factors. The first one is the level of non-performing loans, which is largely related to the above-mentioned labour market. But growing default rates are not automatically translated into loan loss provisions. The amount of incurred losses is also dependent on the level of collateral, i.e. on the value of the financed real estate. Therefore our sensitivity analysis elaborates on both, falling real estate prices and increasing amounts of non-performing loans.

Against this background we further developed the methodology used by Lintner and Rychtárik, Importance of real estate as credit risk mitigation in the Slovak Republic 2010. Based on a sample of selected Slovak banks, we observed the behaviour of the housing loans portfolio using monthly data covering the period from January 2000 to June 2013. As a starting point, we separately calculated the residual value ( $RV_t^i$ ) of the loans extended in each month. The leading idea is based on subtracting the sum of realised instalments ( $RI_t$ ) from

**Figure 1: Relation between annual growth of housing loans and housing loans to total assets in euro area countries**



Source: ECB, EUROSTAT, own calculations.

Note: Size of the bubble represent the share of housing loans in the GDP.



the original value ( $OV_L^t$ ) of loans extended in each month, i.e.

$$RV_L^t = OV_L^t - \sum_{i=t}^{June 2013} RI_i$$

In this calculation we used the average interest rate and average maturity dynamics for each month. In addition, we had to deal with imperfect information about the loan-to-value (LTV) distribution. The available data only shows the percentage of loans within one of the five large intervals. To ensure that the test results are “smooth”, we split all five large intervals into smaller buckets and the corresponding loans were distributed uniformly into the new intervals. The first and the last large intervals were considered to have the amounts gradually decreasing towards the extreme LTV values. These new intervals will be referred to as “LTV values”. This was the essential input to calculate the original collateral value ( $OV_C^t$ ) for each LTV value and for each month separately:

$$OV_C^t = \frac{1}{LTV_t} OV_L^t$$

Thereafter, the results were adjusted by the real estate price index ( $r_t$ ):

$$PV_C^t = OV_C^t r_t$$

Thus, the values of  $PV_C^t$  became easily comparable, and we could start our stress test, i.e. to calculate the effects of decreasing housing prices. We assumed that the amount of loans for each LTV value remained unchanged, and the value of the collateral decreased. Therefore we found for each LTV value a new LTV value. To find the amount of loans for each LTV value after the price shock, we merged the results from the previous step and created a new distribution of loans according to their actual LTV value. In such a way, we could

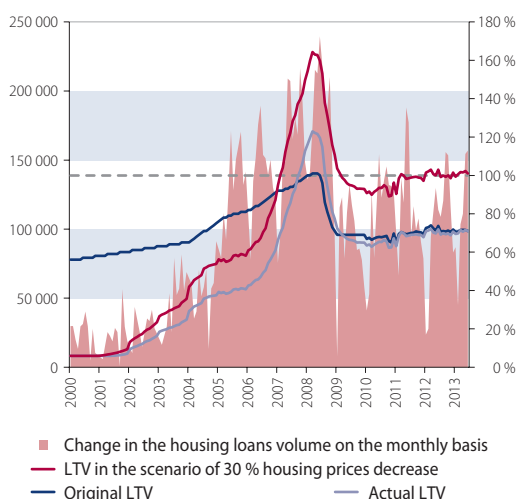
identify the uncollateralized part of loans by specifying the portion of loans exceeding 100% within each LTV value. By summing the latter for each calendar month we calculated the amount of uncollateralized loans since 2000.

Finally, we used information on non-performing loan ratios in individual banks. We assumed a uniform distribution of non-performing loans in the portfolio; for example 4% of NPLs in the total outstanding amount of loans means that the non-performing loan ratio of undercollateralized loans is 4%. Consequently, the same 4% should be present in the amount of the uncollateralized part of the loans. According to accounting principles, banks have to build up loan loss provisions corresponding to the amount of non-performing loans not covered by collateral. Thus, the incurred loss is a function of the share of non-performing loans and of the decline in the value of collateral. In our analysis, the decrease in the value of real estate collateral was understood as a macroeconomic phenomenon with a homogeneous effect on all real estate collateral accepted by banks. Nevertheless, in relation to the shock of non-performing loans, important differences in the non-performing loans held in individual banks are to be taken into account. Therefore, a possible default rate shock is evaluated by the introduction of a coefficient multiplying different baseline levels of non-performing loans. Banks with currently better quality of loan portfolio would be hit less severely than banks where the level of non-performing loans is higher already in the base line. Losses were calculated for all individual banks and subtracted from their Tier 1 capital.

## RESULTS

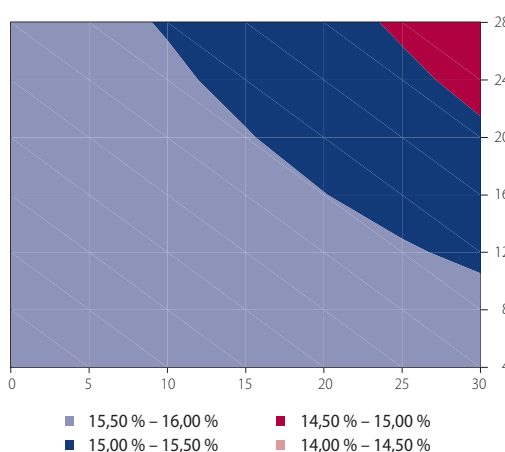
The calculation was done for the banking sector as a whole, as well as for every individual bank. On the one hand, aggregate results are impor-

Figure 2: Average LTV and changes in housing loans volume



Source: NBS, own calculations, LTV values represents average LTV for each calendar month.

Figure 3: Tier 1 ratio as a function of the NPL rate and decrease in housing prices

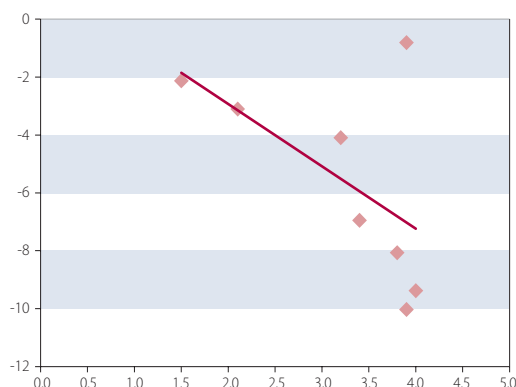


Source: NBS, CMN, own calculations.

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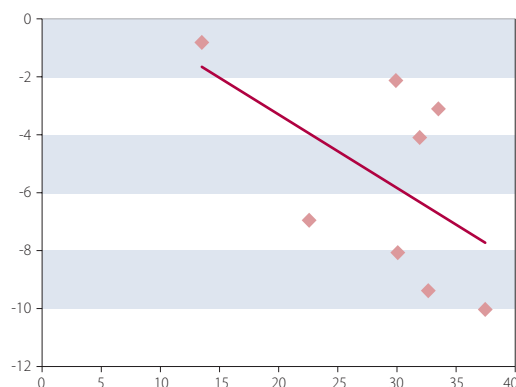


Figure 4: Percentage decrease in the Tier 1 ratio for individual banks as a function of the share of non-performing loans



Source: NBS, CMN, own calculations.

Figure 5: Percentage decrease in the Tier 1 ratio of individual banks as a function of the amount of loans extended with LTV over 85%



Source: NBS, CMN, own calculations.

tant from the systemic point of view: they can be used to identify the general sensitivity of the local banking market to different combinations of default rate increases and falling prices of real estate collateral. Changes of such results over time can play an important role in macro-prudential policy decisions. On the other hand, test results for individual banks are meaningful for the potential impact of their different LTV policies. It gives us some understanding whether eased collateral standards for mortgage loans are sufficiently offset by higher capital levels and higher quality of loan portfolios.

The performed tests have shown that on the aggregate level, even in the case of the most severe scenario which comprises a decrease in housing prices by 30% and the level of non-performing loans at almost 30%, the banking sector as a whole is able to absorb the losses without a significant impact on its solvency (less than 2 p.p. decrease in the Tier 1 ratio). Moreover, if we included the unaudited profit generated during the current year into the testing model, the costs of provisioning due to the increase in non-performing loans (less than 0.5 p.p. decrease in the Tier 1 ratio) would be almost fully absorbed. This conclusion could sound surprising if we realize that collaterals for the housing loans extended in 2007 and 2008 lost about 20% of their value, while the outstanding amount of these loans did not change materially due to the slow repayment of loan principals. Moreover, the mentioned period saw fast credit growth, so the volumes of loans that became under-collateralized is far from negligible. These results are however less astonishing if we realise that housing loans account for some 25% of the balance sheet, which limits the magnitude of their overall impact.

The aggregate results showed spectacular robustness of the Slovak banking sector; nevertheless, it is important to analyse the dispersion of risks among individual banks. The first important finding is that the dispersion of the impact

of the adverse scenario on individual banks is rather limited (between 0.1 and 1.3 p.p. of the Tier 1 capital). Thus, the overall solvency of individual banks would not be materially affected. The second important conclusion is related to two factors of vulnerability. We observed a relationship between the initial portion of non-performing loans and the decrease in the Tier 1 capital. Also, the share of loans with the loan-to-value higher than 85% seems to play a role in the sensitivity of individual banks. This means that under our scenario (30% decrease in collateral prices, 7 times non-performing loan share) the vulnerability of banks is determined by both asset quality and loan-to-value policy.

## CONCLUSIONS

The results showed relatively high robustness of the Slovak banking sector even under the very severe scenario of a 30% fall in real estate prices and an increase in non-performing loans of up to 30%. Moreover, this robustness was assessed to be relatively high not only on the aggregate level, but also in relation to individual banks. There are basically two main reasons for such a positive conclusion. Firstly, balance sheets of Slovak banks are currently rather robust: they feature high capital levels and a solid quality of their loan portfolios. Secondly, the share of housing loans in the aggregate balance sheet, despite being one of the highest in the EU, is still "only" 25%, which limits the overall impact of such a potential shock. These two positive factors proved to be able to largely compensate for the previous and current loan-to-value policies, where relatively large amount of loans were provided with a loan-to-value higher than 85%. Unfortunately, neither high capital buffers combined with sound portfolios, nor a limited exposure to the real estate sector, can be taken for granted and therefore the overall vulnerability is expected to increase over coming years.

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