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Mortgage portfolio in Lithuania, Latvia and Estonia: analysis of main factors

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Abstract **The aim of the paper is to find out the most important macroeconomic factors that are determining dynamics of mortgage portfolio in Lithuania, Latvia and Estonia. The research of the mortgage portfolio of Baltic countries has been carried out based on correlation and regression analysis of the macroeconomic factors.**

Keywords - **Mortgage loans, economic growth, financial crisis, commercial banks.**

I. Introduction

The real estate market is an important industry in any country both from the social and economic perspectives as the objects of housing market may be considered to be an essential. The real estate market of Estonia, Latvia and Lithuania, after country's had regained their independence started a significant course of development throughout the previous decade when the objects of real estate market became more of a value as well as they became objects of investment and speculation. Resultant of that certain market segments witnessed substantial price fluctuations which also reflected on the overall economic situation.

The aim of the paper – to find out the most important macroeconomic factors that are determining the dynamic of mortgage portfolio in Lithuania, Latvia and Estonia.

The object of the paper – the mortgage portfolio of the three Baltic countries and macroeconomic factors of the mortgage portfolio.

II. Changes in the sizes of mortgage loans and influencing factors

Recently, a major part of the new member countries of the EU have been experiencing a rapid increase of the household sector debt. The intense growth of crediting is a core factor in the strife to catch up with other countries as it demonstrates the strengthening of the finance sector. However, it may also be a risk factor of the financial and macroeconomic indicators. An excessive debt of households, especially if the debt comes in a foreign currency, may also be a factor influencing the financial crisis (Aslund, 2009). The loan and real estate markets of the Baltic countries have been growing several times faster than these of the EU; however, as a result of the worldwide financial crisis it suffered the most painful collapse of economy in the EU. Changes in the sizes of mortgage loans and the influencing factors are extensively explored in macroeconomic overviews. According to economic writings, excessive concentration or excessive growth in a single sector of economy may lead to the instability of the whole economy.

According to Sahel and Vesala (2005), various indicators of the financial market need to be under permanent observation in order to assess the tension which is present in financial markets both at national and international levels. Factors most prominently reflecting disturbances that are present in financial markets may be defined as: deviations from the regular mortgage prices predominant in the financial market; Insecurity and uncertainty experienced by participants of the financial market due to long-term and prominent deviations of the mortgage market prices.

According to Stefan (2010), due to the major imbalance of the economic results of the Baltic countries, alteration of results would have pushed towards an economic crisis sooner or later anyway independently from external circumstances. The downturn of economy was extremely rapid and painful as a number of factors contributed to it:

- Decreased competitiveness of the countries.
- Decrease of demand for exported goods.
- A "bubble" of high prices and the sector of real estate.
- Residents of foreign countries withdrew their deposits from banks due to excessive risk.
- Foreign investors refused to invest into risky Baltic countries.

The economic collapse resulted in the decrease of the GDP in the Baltic countries, the decrease of the actual wages, the increase of the level of joblessness, the fall of the real estate prices and in the systematic increase of the number of debtors unable to repay their debts.

The increased loan-taking was related with essential alterations regarding the balance assets of banks.

First of all, bank investments into government bonds have soared; as a result, commercial banks started keeping an extremely significant part of their property in the shape of government bonds.

Goodhart, Hofmann (2003) explored the long-term relationship among bank credits, GDP and mortgage prices. On the basis of impulse response analysis they also

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found out that there exists an interrelationship between the prices of credits and mortgage. On the other hand, as mentioned above, it is complicated to identify the impact of credit demand and supply on the changes in real estate prices as the pricing of the real estate may also be impacted by the credit demand and supply.

In his vector error correction model (VECM), Hofmann (2001) included the average of the prices of housing and commercial real estate and researched a prominent dynamic interrelationship between loans provided by banks and housing prices (the latter variable is the causal one). The author believes that the fluctuations of banking credits and real estate prices together establish the alterations of actual short-term interest rates. Hofmann observes that at the macroeconomic level it is extremely complicated to separate the impact of credit demand and credit supply upon the prices of real estate.

In his empirical research, Hofmann (2001) considers five key variables:

- Actual mortgage prices;
- Loans actually provided to the private sector;
- Actual GDP;
- Actual short-term interest rates;
- Actual private investments.

The actual short-term interest rate was selected instead of long-term interest rates as it reflects the behaviour of a monetary policy optimally.

Researches have proven that there exists a positive relationship between the conditions of the issued loans and the mortgage prices as well as the growth of GDP. These results maintain impact on the risk of a credit and thus should affect the pricing of loans and the sufficiency of the capital.

Among various macroeconomic factors, GDP possesses the predominant influence on the pricing of real estate and bank loans.

Bernanke and Gertler (1989) as well as Kiyotaki and Moore (1997) develop a modified real business cycle model with information asymmetry in credit markets. Due to discrepancies of information, enterprise and mortgage loan taking is restricted; loans may be obtained only when some assets are mortgaged; this implies that obtaining a loan depends on the net value. As the net value of loan-takers is cyclical, their loan-taking capability increases with a rise in economy and falls when economy shrinks.

A positive correlation between credit and economic activity may develop due to the impact of credit demand and credit supply or with changes taking place in the credit market as well as with alterations of economic activity.

A strong relationship between credit scores and prices of real estate may adversely affect changes concerning the alterations of credit supply and real estate prices. Real estate prices may influence the credit demand indirectly by promoting economic activity on the basis of asset influence. The influence of assets may also evoke direct impact of asset prices on the demand for accommodation. Considering the cyclical model of household consumption, household owners react to the increase of real estate prices by increasing their expenses and taking loans in order to lead prosperous lives. On the other hand, the increase of real estate prices also leads to the trend of boosted mortgage prices. Mortgage-payers may react by restricting their consumption and loan-taking.

Both Davis, Zhu (2004) and Hofmann (2001) claim that the mechanism of “finance accelerator” presupposes an alternative explanation of the coincidence of loan-taking and asset price cycles. The asset reserves are constant in the short term; as a result, the value of mortgaged households and enterprises mostly incites the shifting of asset prices. The increase of loan-taking promotes economic activity; hence asset prices are additionally raised so that the process should evolve by itself.

As real estate is often used as a mortgage when taking a loan, the prices of real estate are more related with the loan-taking capability of the private sector rather than with the prices of assets, for example, with the prices of shares. Thus a close relationship between crediting conditions and real estate prices has a direct impact on the mechanism of “finance accelerator”.

The aggregate demand, interest rates or the impact of the fluctuation on bank loans and deposits in banks may be theoretically researched by employing the common IS-LM model where a part of private expenses needs to be financed from the bank loan. However, considering the initial absence of surplus reserves in banks, the expansive impact in this model depends on the elasticity of the demand of the monetary base regarding interest rates. If it is low, the growing inclination of banks to issue loans has only minor significance regarding the general demand, i.e. it merely raises interest rates, and in this case, LM is vertical. The econometric model links the ratio of loans issued to individuals and the income of one resident with the ratio of the state debt and GDP, inflation, means of finance liberalization, law regulations and the business culture.

A claim can be made that in order to avoid a bubble in the real estate market and to maximally decrease the negative impact of real estate prices on the activity of banks, banks should undertake stricter methods of loan management. The key indicators which should be given most attention is the ratio of GDP growth, rate of interest, inflation, joblessness, mortgage prices and household income.

The development of banking loans increases demand in the market and in the long term influence the decrease of real estate prices. The long-term negative impact on the credits provided by banks means that banks should undertake an assessment method considering long-term prospects and forecasting market alterations.

III. FACTORS AFFECTING MORTGAGE CREDIT GROWTH IN THE BALTIC COUNTRIES

In order to consider the factors affecting the mortgage credit growth in the Baltic countries and the issue of their interrelationship, an adapted research method for dealing with the issue is suggested.

The methodological foundation for the research is the model developed by Backe, Egert, Zumer (2006); the authors primarily overview the extension of bank credits and further on research how the fundamental macroeconomic indicators affect the loan and mortgage loan portfolio. They apply the model to 11 countries of Central and Eastern Europe, namely, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic and Slovenia.

The criteria considered by the authors cover GDP per capita, nominal interest rates and inflation.

In order to provide a more extensive research of the variables influencing the mortgage loan portfolio, Backe, Egert, Zumer (2006) model will be edited and supplied with several additional criteria.

The researched factor:

Percentage change of the mortgage loan portfolio.

Variables affecting the researched factor:

1) Actual annual change of mortgage prices, per cent.
2) Actual and nominal GDP change, per cent.
3) Actual mortgage loan interest rates in the national and foreign currencies.
4) Actual and nominal interest rates:
   a) Actual and nominal Vilibor, Talibor and Rigibor interest rates, per cent.
   b) Actual and nominal Euribor interest rates, per cent.
5) Actual changes of deposits, per cent:
   a) Actual changes of all deposits, per cent.
   b) Actual changes of deposits of natural persons, per cent.
6) Growth of wages, per cent:
   a) Gross growth of wages, per cent.
   b) Net growth of wages, per cent.
7) Alteration of joblessness levels, per cent.

The period under research: 1999 to 2010.

Correlation analysis and the statistical model of multiple regression were employed for the research of mortgage credit growth issue identification; as a result, the obtained results highlight not only the interrelationship of the researched factors but also their interdependence.

Having calculated the correlation relationship of mortgage loans and mortgage prices of the three Baltic countries throughout the considered period of 1999 to 2010, positive medium-strength statistically reliable correlation relationship of the two macroeconomic factors was obtained (r=0.7296). When considering the Baltic countries individually, it was established that the weakest relationship between accommodation prices and mortgage loans was observed in Estonia where the correlation relationship of the researched factors was the least significant but still statistically reliable (0.7397; *p=.014). In Lithuania, medium-strength positive correlation relationship was obtained while in Latvia it was the strongest of the three Baltic countries.

Having researched the impact of GDP on the mortgage loan portfolio, results obtained in academic researches confirmed that the growth of GDP is one of the key factors most prominently affecting the alteration of the loan portfolio. First of all, correlation analysis was conducted in which it was established that the actual changes of GDP were related with the mortgage loan portfolio in terms of positive medium-strength correlation relationship in all the three Baltic countries (r=0.7695). When considering specific countries, it was calculated that the strongest correlation relationship of the actual GDP and the actual mortgage loan alteration was present in Estonia (r=0.9203), slightly weaker in Latvia (r=0.8259) and the weakest of all in Lithuania (r=0.7359). All the obtained correlation relationships were statistically reliable.

The research was further conducted by analyzing the correlation relationship of all deposits and natural person deposits with the mortgage loan portfolio in all the three Baltic countries. The obtained results of correlation analysis showed that alterations of all deposits were related by medium-strength correlation relationships in Estonia (r=0.6634) and the three Baltic countries taken together (r=0.6426). Among the researched countries, Latvia was singled out where the growth of deposits showed the strongest positive statistically reliable correlation relationship with the alteration in mortgage loan portfolio (r=0.8757). The obtained research results suggest the conclusion that the growth of the Latvian mortgage loan portfolio was the most balanced as it was conditioned by the increasing reserves of available money in Latvian banks. Having reiterated the analysis by considering alterations of natural person deposits, essentially identical results were obtained. However, the conducted correlation analysis confirms that the researched factors were changing towards the same direction but still it does not prove that they were influencing each other.

Regression analysis of all deposit and loan portfolio alterations was also conducted. One-dimensional linear regression equations were obtained with relatively significant standard deviations and minor determination quotes; in Lithuania, r^2=0.25, in Latvia r^2=0.59, in Estonia, r^2=0.44. As a result, a claim can be made that the growth of deposits was not the determining factor of the mortgage loan portfolio growth in the Baltic countries while alterations of these factors merely coincided during the researched period. Scandinavian banks covering the largest part of the Baltic loan market borrowed monetary funds required for mortgage loans from mother banks in Scandinavia but not from the local deposit market in the Baltic countries.

Alterations of wages had no significant impact on the alterations of the mortgage loan portfolio since the average wages were changing relatively slowly. The obtained results of correlation analysis showed that the changes in wages and the mortgage loan portfolio were interrelated by very weak and unreliable correlation relationship. Regression equations are of different directions because of small determination quotes and large standard deviations.

As a result, a generalization of the obtained results allows the claim that commercial banks of the Baltic countries when providing loans did not consider the alterations of wages and that the growth of loans was not proportional to the growth of remuneration in the discussed countries.

Having conducted a correlation analysis of joblessness alterations and mortgage loan market in the Baltic countries, medium-strength negative statistically reliable correlation relations were obtained in all the countries except for Lithuania. The cumulative correlation marker was statistically reliable, negative and of medium strength (r=-0.7296). Positive changes in the job market, i.e. the decrease of joblessness, were mostly related with the growth of the mortgage loan market in Estonia (r=-0.8394). In Latvia, the researched factors showed a weaker correlation relationship (r=-0.745); in Lithuania, no significant relationship between changes in the labour market and the mortgage loan portfolio was discovered.

The research continued with a regression analysis of the interdependence of joblessness levels and mortgage loan portfolio. The obtained results of the regression research showed that the changes of the labour market most strongly affected the mortgage loan portfolio in Estonia where the determination quote was the highest at r^2=0.7046; in Latvia, the interdependence of the two factors was the lowest at r^2=0.5550 among the researched Baltic countries (see Picture 22). As a result, the obtained results of regression research confirmed that the growth of joblessness in Latvia in 2008-09 extremely strongly restricted the provision of new mortgage loans.

It is also to be mentioned that the relationship of the factors researched in the regression analysis was extremely strong; however, regression equations defining their interdependence contained significant standard deviations, namely -0.14577 in Lithuania, -0.15647 in Latvia and -0.09387 in Estonia.

The conducted research confirmed the results provided by various authors that GDP is the factor with the strongest influence upon the mortgage loans. The actual growth of GDP had strong and statistically significant correlation relationship with the mortgage loan portfolio in all the researched countries.

The results of the research of the influence of mortgage prices upon the loan portfolio showed that in Latvia, the impact of the real estate prices was the highest of the three Baltic countries. Besides, the research of the Baltic loan market highlighted that one of the key factors, namely, the actual interest rates, showed no statistically reliable relationship with the actual changes in mortgage loans. However, the alteration of the loan portfolio in the Baltic countries showed significant negative correlation relationship only with the nominal national interbank interest rates, i.e. Vilibor, Rigibor and Talibor.

Fluctuation of the average income of residents was not significant or had only extremely minor influence upon the portfolio of mortgage loans in the Baltic countries; this could have been one of the core reasons of the imbalanced growth of the loan portfolio.

IV. Conclusions

1) The conducted research confirmed the results of other analyses that GDP is the most influential factor in terms of affecting mortgage loans. The real growth of GDP had strong and statistically significant correlation relationships with the portfolio of mortgage loans in all the researched countries.
2) Having researched the impact of mortgage prices on the portfolio of mortgage loans the obtained results highlighted that of the three Baltic countries, the influence of the real estate prices in Latvia was the highest. The obtained results confirmed that the economy of the country is more balanced and that the growth of the loan portfolio is significantly related with the growth of GDP (the case of Estonia) but not with the fluctuation of the real estate prices (the case of Latvia).
3) Having researched the loan market of the Baltic countries it became evident that one of the key factors, namely, the actual interest rates, had no statistically reliable relationship with the actual alteration of mortgage loans. However, the changes of the loan portfolio in the Baltic countries showed significantly negative correlation relationship only with the nominal interbank interest rates, i.e. Vilibor, Rigibor and Talibor.
4) The alteration of the average income of the residents were not significant or had very low significance upon the mortgage credit portfolio in the Baltic countries which was likely one of the core causes of the imbalanced growth of the loan portfolio.
5) The loan market was sensitive to the fluctuation of the levels of joblessness throughout all the three Baltic countries. The other researched factors, such as deposits and wages, were not significantly related with the development of the mortgage loan market of the Baltic countries.

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