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Prediction of Mortgage Market Development through Factors Obtained in a Scoring Model

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Abstract

We currently focus on the stability of our banks in Europe and try to find out whether our European banks may be endangered the same way American banks were and whether the situation on the mortgage market may repeat itself in our country with such vehemence that was experienced in America. European banks do not seem to have any problems with toxic assets of Collateralized Debt Obligation, as was the case with Investment banks in the USA (the European financial market is not as developed as the American), but they rather search for an answer to the question whether the first impulse, i.e. mortgage defaults in the USA, might have been caused by wrongly applied methodology of scoring and whether the methodology of scoring (or a part of it) can be used for the prediction of the mortgage market development in order to prevent material defaults and to adjust the scoring model to respond to changing market conditions.

Keywords: scoring, disposable income, mortgage

Introduction

At present in Europe, we still vividly remember the financial and economic crisis in the USA that also affected Europe, mainly in the form of the economic crisis – deceleration. In Europe, there is still a lot of speculation about what might have caused the banking crisis in the USA and whether we may face the same situation in the banking industry in Europe as well. In Europe we encounter two main streams of opinions on what caused the crisis in the banking industry, on financial markets and subsequently in the whole economy. The first hypothesis claims that the crisis resulted from bad decisions concerning mortgages that were granted to people who could have been expected not to be able to repay the loan (this hypothesis was based on the assumption that there was absolute absence of scoring models based on the applicant´s income and deposit (e.g. the scoring model has to be approved by the Central Bank in the Czech Republic). This hypothesis was also based on the assumption that a sort of business model had prevailed over the risk model. Another hypothesis claims that the financial crisis was caused by a step change of mortgage interest rates; even Europe sees changes of interest rates after the termination of the interest rate fixation. The last hypothesis to consider is the fact that all the above-mentioned hypotheses came true, i.e. there was change in interest rates (upwards due to FED interference aiming to prevent inflation). It means that there was not a sufficient reserve in client´s disposable income in scoring models and funding was thus provided to those people who should not have been granted anything under „normal" conditions, i.e. under unaltered conditions prior to the crisis. The author of the article does not intend to deal with the crisis that has been analysed in numerous articles before, but he wants to focus on the stability of scoring models which would also include those factors that caused the crisis and resulted in defaults with clients. Scoring model should also – exclude those clients who should not be granted a loan under standard – unchanging conditions as well as those who would not hold out if the market conditions changed. Following the above-mentioned facts, it should then deduce the factors to predict the development of the mortgage market.

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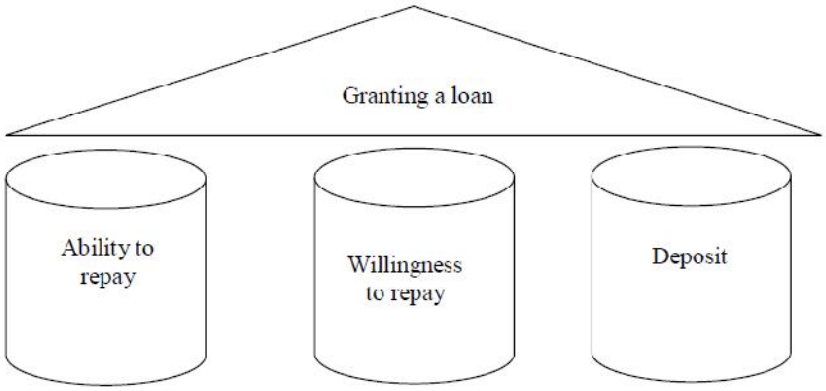
Basic Pillars within the Loan Decision-Making Process

In some European states with an advanced banking system we can find basic prerequisites for granting loans without the need to distinguish whether it involves a natural person or corporate body. These basic pillars are summarized in the following figure – it refers to the basic pillars contained in the scoring and rating models of banks.

Table 1: Granting a loan



Source: Mareš, D. Crucial Factors in Social – Economic Provision of Social Welfare for Physical Entities with Credit

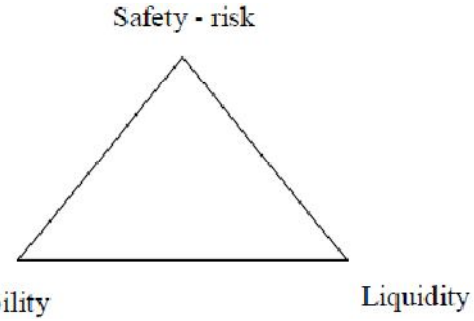
Given pillars can be arranged hierarchically from left to right – i.e. if a client is not able to repay the assumed credit for which he applies, in relation to his disposable income he is not granted the loan and there is no need to carry out the analysis of the willingness to repay and the right of lien for the real estate intended to cover the loan.

This system can be described as follows:

1) Ability to repay – if the client has sufficient means to cover the loan instalments, we proceed to point 2, if not – we decline the loan.
2) Willingness to repay - in case the client faced problems with repayments in the past – if those problems had been serious, we shall not grant the loan – if we conclude there will be willingness to repay – we proceed to point 3.
3) Deposit – we follow LTV rule. After the impact of USA economic crisis on the Czech Republic, granting loans was restricted to 100 % of the real estate value. In the Czech Republic, real estate is appraised through a bank – bank appraisal represents ca 90 % of real estate purchase price.

Naturally, there might be exceptions within the process, e.g. the so-called American mortgages (non-purpose mortgages) which, however due to higher risk (they are not based on the ability to repay), have higher interest rate. Following mechanism well-known from most textbooks should then be applied here.

Figure 1: Relationship between Safeties – Risk, Profitability, Liquidity

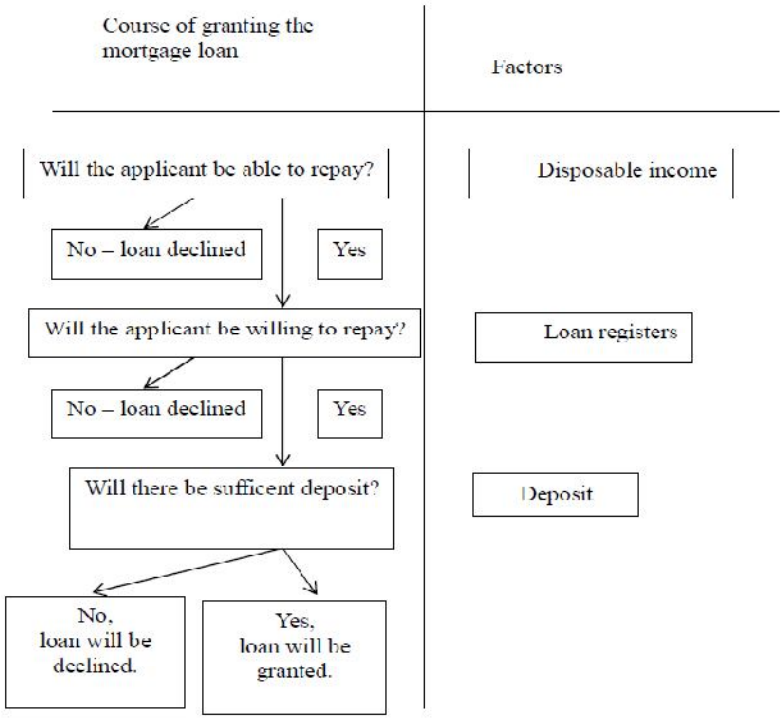


Source: adapted according to KLÍMA (2010)

However, most of the business banking should be based on those three pillars above.

The process in question is depicted in the following figure:

Figure 2: Loan Process



Source: own elaboration

Factors and Sub-Factors Influencing the Scoring Model and Mortgage Market

The above-mentioned process indicates barriers that prevent default with loans, thus avoiding bank collapse. It means that if there is a default with a client as a result of failure to loan repayment, bank may use the deposit, the selling price of which, however, must be sufficiently high at the time of the sale to cover the possible loss of loan non-repayment. Following the above-mentioned process of granting a loan, we discover the main criteria which may determine the development on the mortgage market.

Table 2: Scoring Factors

Factor	Sub-factors
Disposable income	- Type of contract (definite, indefinite period) - Type of job (seasonal, all-year, in a branch with structural unemployment) - Amount of eligible income - Amount of eligible expenses - Amount of unplanned expenses in future (e.g. change in loan instalments due to increased interest rate of loan) - Price increase (e.g. due to higher VAT) - Shopping addictions (and other addictions) - Account activities - and others
Loan register(s)	- Problems with past repayments - unpermitted debits with credit and debit cards - and others
Deposit	- Appraisal set-up - LTV - development of real estate prices

Source: own elaboration

The table above presents following facts:

a) The loan process is to a certain extent an individual thing in terms of data detection (some facts cannot be traced without the help of in-banking systems or they simply are not available).
b) The loan process is to a certain extent an individual thing that develops according to the experience of the loan clerk and familiarity of the client.
c) The development of the loan process is influenced by previous experience of granting loans, which means it leads to either stricter or less strict conditions in relation with the previous development, e.g. by reducing LTV with future mortgage loans, based on previous defaults with 100-and-more % LTV.

Selected Factors of Mortgage Market Development on the Basis of a Scoring Model

Given the data availability, we are allowed to analyse sub-factors that can warn against negative development on the mortgage market with a negative impact on the bank. However, points a, b, c (see above) need to be taken into consideration. A suitable sub-factor of the scoring model to predict the development on the mortgage market and the subsequent development of mortgage defaults is considered Net money income of household which has an impact on the disposable income.

Disposable Income

The methodology of disposable income production was explained in (MAREŠ, D. 2012); its significant part is income. Net money income of household should confirm or exclude the interaction between the income of household and drawing upon loans.

Table 3: Progress of Contractual Principal and Net Money Income of Household

Year	2007	2008	2009	2010	2011	2012	2013
Contractual principal of mortgage loans total (´000 CZK)	130 034 564	99 097 063	65 900 887	75 738 089	107 906 433	108 711 831	132 685 472
Net money income of household	118 027	127 956	139 733	143 118	144 597	147 456	149 737

Source: based on data provided by the Ministry of Regional Development ČR 2014 and Czech Statistical Office 2014 and 2010

The above-mentioned table shows that in the period of 2007 – 2008, the development of Net money income of household did not correspond to the development of the volumes of contractual principal of mortgage loans. This discrepancy might have been caused by the economic crisis and the subsequent decline in trust of consumers in economy and the reluctance to draw upon mortgage loans, even despite low interest rates funded by the Czech National Bank (the Central Bank of the Czech Republic). According to (Řežábek, 2009), in the summer of 2007 in the USA a chain reaction was set off on financial markets. The first phase of the crisis transfer to the Czech Republic occurred in August 2007 - September 2008, but with minimum impact on Czech economy. The second phase of the crisis according to (Řežábek, 2009) was felt in September - November 2008 and hit the financial system of the Czech Republic with a „regional decline in trust". „The crisis transfer from the financial sector abroad to the real economy abroad, however, has and will have consequences for the real economy in the Czech Republic". Furthermore, according to (Řežábek, 2009), the growth of the Czech economy till 3Q 2008 continuously slowed down and 4 Q 2008 saw a radical turning point, tentatively according to the Czech Statistical Office the growth of only 1.0 %. In the subsequent years, we can already see the increase in Net money income of household and the contractual principal of mortgage loans. Under certain conditions, Net money income of household can be considered a suitable indicator for the prediction of mortgage market development.

Conclusion

The author suggest a methodology for the prediction of mortgage market development. This methodology is based on the scoring model of a bank and European experience of granting loans. The article also tests a suitable indicator for measuring the mortgage market development based on historical data. The prediction of mortgage market development by means of the factors and sub-factors of the scoring model is suitable not only in terms of the prediction of granting mortgage loans by the relevant bank, but also for the subsequent modification of factors and sub-factors (stricter or less strict) within the scoring model in order to prevent defaults with clients in the future.

By applying a suitable scoring system, which will be updated in relation to the market development and it will also work with the analysis of the previously granted loans, it may lead to fewer defaults even in case of economic and mortgage crisis. The author points out that the mortgage market prediction is a much more complex topic and should not be based on one factor only, nevertheless the analysis of more factors would exceed the limits of one article. The author also stresses the risks of aggregate statistics; during an analysis it is important to take into account regional differences (Czech Republic) or the differences of relevant USA states; the difference among relevant USA states is discussed e.g. by (KIERSZ, A., HOLODNY E. RANKED, 2014).

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