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**Risk Evaluation of Mortgage Loans’ Securitization**

One of the key goals of any credit institution is to evaluate the credit risk, because that approach helps to estimate the capital adequacy ratio. The company’s positive performance on the capital market mainly depends on proper risk estimation. It is commonly known, that one of the causes of the Global Financial Crisis 2007-08 has been the burst of the housing bubble in the USA. That happened because the risks of mortgage loans’ securitization were evaluated incorrectly.

Another example of the improper credit risks estimation, that negatively affected the economic situation, was the collapse of Russian Ruble in 2014. The mortgagors, who borrowed money in the US Dollars from the banks, were unable to discharge their debts. Technically, that kind situation might be defined as a mortgage default. This situation had two effects: 1. the total amount of mortgage credits had dropped heavily; 2. the mortgage rate had risen sharply.

Both of the described situations let us to assume, that the risk estimation model should include endogenous and exogenous (macroeconomic) factors.

CDS (Credit Default Swap) - is a particular type of swap designed to transfer the credit exposure of fixed income products between two or more parties. CDS also demonstrates the value of securities’ cost of risk. The multiple market participants (investors) evaluate the CDS at the real time, thus they can give a relatively fair evaluation of company’s credit risk.

The Basel Committee on Banking Supervision (BCBS) created its own mythology, which estimates credit risks. The key issue of that approach is an internal ranking of banks. The majority of scientists believe that that approach is way too subjective. The main goal of any credit organization, that needs to identify and minimize all the risks, is two calculate the probability of the credit default. The second goal is to foresee all the loses, that might be caused by the borrowers’ mortgage default.

The majority of empirical papers, which studied the factors that affect or have a positive impact on credit risk, describe the US market. The models, which can predict the mortgage default, might be also implied to the US market. In my research I’ve studied the German market. The German economy is the leading economy in the European Union. It has a huge impact on the world’s GDP.

The hypothesis of my research is that the dynamic of macroeconomic factors correlates with the mortgage defaults of households.

The purposes of the research are:

* To identify the regularities of mortgage loans’ market;
* To compare the different approaches of credit risk modeling
* To create a models that will identify the key-factors that have an impact on the risk evaluation of mortgage credit securitization (securitization is the financial practice of pooling various types of contractual debt)

Test subject of the research: the risks of the households’ defaults (arrears is 90+ days).

The mythology of the research is vector autoregression model (VAR-model), created with the help of packages ‘vars’ and ‘lmtest’ in R (software environment for statistical computing). The data were taken from Bloomberg Database and web-page of Statistisches Bundesamt.

VAR- model is an econometric model used to capture the linear interdependencies among multiple time series.

As the first step of the research we have assumed that the mortgage default of the households correlates with these time series: Index Of Current Economy Conditions ZEW, Index Of Business Optimism IFO, Index Of Current Situation Estimation IFO, Index Of Economy Expectations IFO, Index Of Business Activity Industry Markit, Bonds Of Hypoteken Bank AG, Index Of Business Activity Service Markit, Index Of Business Sentiments ZEW, households’ defaults (arrears is 90+ days), DAX Index, Building Permeation Index, Rate Of Mortgage, Unemployment rate.

As the second step we created an ARIMA-model to testify the stationary of the time series and to reveal if the time series have heteroscedasticity or not.

As the third step we have estimated VAR-model as the function:

Houshold’s Defaults = IndexOfCurrentEconomyConditionsZEW.l1 + IndexOfBussinessOptimismIFO.l1 + IndexOfCurrentSituationEstimationIFO.l1 + IndexOfEconomyExpectationsIFO.l1 + IndexOfBussinessActivityIndustryMarkit.l1 + BondsOfHypotekenBankAG + IndexOfBussinessActivityServiceMarkit.l1 + UnemploymentRate .l1 +IndexOfBussinessSentimentsZEW.l1 + FailureMortgages.l1 + DAXIndex.l1 + BuildingPermit.l1 + **const + trend**

The estimation of all the coefficients was conducted with the usage of the least squares method. The proper amount of lags was determined with the help of Schwarz criteria. Granger causality test has shown interconnection between variables: Households’ Defaults, Unemployment Rate, Mortgage Rate, Bonds Of Hypoteken Bank AG. The model may predict the households’ default within one lag (one lag equals one month).

During the analysis a significant amount of variables was eliminated. Most of these time series might be described with the help of random walk model. That means that these time series don’t have any internal interconnections. Hence, we have demonstrated that the mortgage defaults of households correlate with the current macroeconomic situation.