

Econometric Models of Russian Banks Ratings

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The problem which is researched in this paper is to analyze how the key financial indicators of the bank influence the credit rating assignment provided by international and Russian rating agencies. The recurring problem was solved with the help of an ordered logistic model. There are additionally considered such factors as a bank's type of ownership (state, foreign and private) and dummy variable corresponding to the year of rating. This research also examines the relationship between models of ratings and defaults. The report consists of 3 sections. The first part introduces the basic concepts of credit ratings. In second part are described the data used for analysis and the model of multiple ordered choice. In third part are presented the results of estimation these models, their predictive power, modal ratings for the sample of banks which licences were revoked in the first quarter of 2016 and the analysis of various reasons for withdrawal of licences.

The problem of the reliability of banks ratings provided by the credit rating agencies (CRAs) is very relevant for developed countries. A market of rating services in the Russian Federation is considered as an «emerging market». However, because of a significant increase in activity in the Russian financial market a demand for rating products and an interest of international rating agencies to Russian financial institutions have also grown. Moreover, independent valuations of entities' solvency play an important role in all economy due to a large amount of information and the high-risk operations on the financial markets. Such a main tool in risk assessment is ratings that help to reduce the asymmetry of information between issuers and other agents of the market.

This research is devoted to answering the question: What important financial indicators are taken into account by rating agencies when they assign credit ratings of Russian commercial banks. In recent years, the demand for banks ratings drawn up by specialized agencies has considerably increased mainly due to the lack of transparency in methodology of CRAs. Many financial market agents believe that the opinion of rating agencies is very subjective and influenced by large numbers of characteristics. Therefore, the aim of the study is to determine key factors that have an impact on CRAs' decisions about financial stability of a bank. In order to achieve this aim several tasks have been fulfilled. Firstly, we were reviewed different methods for estimation creditworthiness of a bank. Secondly, we were constructed a model of ordered response for seven CRAs and found more significant, independent financial characteristics using data from 2012 to 2016 years. Finally, we were compared modelling results between international and Russian CRAs,

analyzed forecasted power of these models and considered the relationship between models of ratings and defaults.

The research is worth conducting as it will help any participants of the financial market to use these results obtained on the basis of publicly available data in their investment decisions. Moreover, it simplifies and makes the analysis of bank's solvency, financial and operational performance more transparent for agents. In addition, the study is also useful for banks in the system of internal evaluation of their activities. Therefore, model ratings constructed in this paper can be actively used to monitor the current reliability of banks.

Therefore, the area of the study is all commercial banks in the Russian Federation that have credit ratings assigned by Russian or international rating agencies in the past four years. The object includes financial indicators, characterizing the reliability and solvency of Russian banks.

For the ratings simulation in this research were collected actual data about all Russian banks credit ratings assigned by 3 best known international CRAs: Standard & Poor's, Moody's Investors Service, Fitch IBCA and 4 Russian CRAs: RusRating, Expert RA, National RA and Analysis, Consulting & Marketing. These data were collected from official websites such as Banki.ru and Bankodrom.ru for 449 Russian banks. Due to the fact that foreign CRAs assign ratings in international and national scales the total number of ratings is equal to 11. We also consider other 465 Russian banks which did not have a credit rating from any CRAs. In addition, we use information about financial indicators of the banking activity from information agency «Mobile». Also the data about a bank's type of ownership were taken from Vernikov (2015). It is important to take into account a time lag is about 1 quarter between the assigned rating and the values of financial indicators. Thus, we use quarterly data for the period from 2012:01 to 2016:01. The maximum number of observations (bank-quarter) in the sample is 15 538.

In order to study ratings we use econometric models of a multiple choice (ordered logit models) because credit ratings are quantitative ordinal variables. The key idea of this modeling is to estimate all unknown parameters with a maximum likelihood procedure and to choose the adequate model that will describe the initial data in the best way. To achieve this goal we need to compute the generalized Huber-White standard errors. This stage helps us to reduce heteroscedasticity of errors. Moreover, we need to check the absence of multicollinearity in the data, compute different models for each CRA, then choose models with the highest coefficient of determination, the lowest standard mean square error and the greatest number of significant coefficients with the correct economic dependence. As a result, the most adequate model that we choose should have the smallest Akaike information

criterion and residuals with properties of normality, randomness, no autocorrelation and no heteroscedasticity.

The models of a multiple choice will allow to estimate the probability of assigning the highest rating as a function of a set of explanatory variables that describe the creditworthiness and reliability of a bank. According to many researchers, the results of this method are easily interpreted and the considered model provides high quality forecast. Therefore, it is very convenient to use such a model in econometric analysis of banks credit ratings.

At the end of the research were found differences between CRAs' approaches in a credit rating assignment. Moreover, rating «degradation» was also shown in 2014, 2015, 2016. This is caused by the sharp devaluation of the national currency, significant falling oil prices, and the imposition of sanctions against Russia. All these factors have influence on a reduction by international CRAs of the Russian country's rating to speculative grade. It is necessary to mention, that a predictive power of rating models was high enough and models for Moody's, Standard and Poor's could predict default of banks really well. In the report also will be analyzed various reasons for revocation of licenses: money laundering, law violation, financial insolvency and voluntary liquidation of the bank.

To conclude, this study is aimed at identification the key financial indicators of banks that are taken into account by rating agencies. Is it possible to achieve this goal using publicly available data? Yes, it is. This issue may be solved with the help of econometric ordered logit model because this method gives the high-precision results. For a more in-depth and comprehensive analysis it would be really useful to deal with machine learnings techniques and to compare the results of different ways of modeling Russian banks credit ratings.

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