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Scoring functions and bankruptcy prediction models – case study for Romanian companies

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Abstract

The purpose of our study is to test the performance bankruptcy prediction models in the recent financial crisis context. We will refer to classic score models, like Altman or Taffler and also logistic regression methods. We apply them on a sample of SME data collected from a central-east European emerging economy, at the end of 2009. The results are in line with the literature – in a financial crisis context, the classical models have to be re-estimated and the financial ratios reconsidered.

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Keywords: credit risk; logistic regressio; scoring functions.

1. Importance of credit risk measurement and basic principles for credit risk assessment

Credit risk has been in the attention of researchers and bankers for decades, as a field of continuous sources for modelling, inter-disciplinary processes and estimation techniques, statistical and econometrical methods. As a general definition, we can say that the credit risk is the risk associated with the unexpected changed in the quality of the debtor. The measurement of this risk is one of the major challenges of modern economic and financial research.

Credit risk measurement has grown into a new dimension of increased importance in the new context of global financial crisis which arose from 2007. It is a known fact that most of the existing credit risk assessment models have failed in predicting the default cases recorded in global crisis situation. In January 2009, New York Times stated: “The best Wall Street minds and their best risk-management tools failed to see the crash coming”. There are many studies related to this subject, the causes which lead to the failure of the risk models in crisis situation. Jorion,

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P. (2009), notes that the losses arose from the 2007 crisis are without precedent. The losses estimated by the International Monetary Fund on US assets are of over $4.000 billion. In his paper, Jorion concludes that risk management systems have to be improved with a greater emphasis on stress tests and scenario analysis.

Crouhy mentions that the major weaknesses in risk assessment and risk modeling come from an "over-reliance on: misleading ratings from rating agencies; unrealistically simple risk models, i.e., models that were not designed to deal with the complexity of structured credit products; inaccurate data; short-term financing with too little consideration for liquidity risk".

1.1. Credit risk evolution in the context of the global financial crisis

The financial crisis that started in 2008 is considered to have as one of its triggers the lack of systemic risks from the housing market that should have been taken into account in the macroeconomic policies. By many analysts, the main cause for the housing bubble in US is the low interest rate policy promoted by the Federal Reserve. This comes as a consequence of the small margins obtained by the banks that were countered by an increased volume in loans. Due to the pressure of granting more loans, the process of crediting became speculative and risk management was overlooked.

Serrano-Cinca et al. (2011) formulate four hypothesis for the failure of a bank. First of all, they note that there are financial symptoms preceding failure, main symptoms in banking industry being the lack of profit, low solvency and drops in efficiency and financial ratios stability. The second hypothesis formulated deals with the risks of specialization in a bank. Although specialized banks could be associated with higher profits and profit efficiency, the risk of concentration is very important, especially if the concentration is on real-estate credits, considering the collapse that happened with the real estate sector in the US housing market.

The third hypothesis approaches the loan growth. More precisely, they draw attention to "rash of troubled loans", that could lead to bankruptcy. This was also proved by a historical study of De Roover (1963) – he concluded that the failure the fourteenth century Florentine Banks was most probably caused by a too broad extension of credit. In the end, Serrano-Cinca et. al (2011) conclude about the two different strategies that could be approached by a bank: increased volumes or increased profitability, each of them can be successful depending on the market conditions.

There is a tendency of building credit risk management system with more automated techniques for the small exposures (classified by the Basel agreements as retail class of assets), but a judgmental analysis for non-retail exposures, as stated by the Basel principles. The threshold for clustering the two types of asset classes (retail and non-retail) has not been clearly stated by the Basel specialists, letting each bank decide this threshold as a function of the each bank characteristics and macroeconomic context.

The Basel II principles encourage banks to adopt internal rating based models in order to calculate risk weight assets. The basic idea of an internal rating model developed by a banking institution is the increased sensitivity to the risky elements that influence the quality of assets, which means an increased attention to the potential losses in a credit portfolio. Thus, the banks are obliged to assess the probability of default for each debtor in a portfolio.

The Basel II regulatory frame which became mandatory since January 2007, created conceptual, strategic and methodology controversies. A "best practices" set was needed to permit the unification of the regulatory approached bank wide. The key variables in the credit risk portfolio models are three parameters: probability of default, loss given default, exposure at default. The correct and accurate estimation of the three parameters is essential for management and an efficient measurement of the credit risk.

Out of the three parameters, the estimation of the default probability offers the possibility of utilizing the most diversified range of methods and statistic techniques. The assessment of the default probability is a fundamental aspect in credit risk management, important both for creditors and debtors. On one side, the creditors are interested in the quality of their portfolio of clients in order to minimize the risk/profit ratio. On the other side, the debtors are interested to be evaluated by the rating agencies with the purpose of obtaining a better price for financing. The estimation of the default probability is the core element of the rating models.