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Determination of Default Probability by Loss Given Default

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Abstract

Determination of credit losses can be provided by banks through the use of an analysis of the actual loan defaults. The quantification of expected losses should be based on an analysis of multiple variables, cause the determination process might be problematic, but it is significant for institutions such as banks but also for others. Main components of the credit risk are the Probability of Default (PD) and the Loss Given Default (LGD). These are included in the credit spread, which is the difference in market prices between defaultable and default-free bonds. The article is dedicated to the theoretical aspects of Loss Given Default.

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1. Introduction

These days measuring of credit risk is considered as a key issue for financial institutions as well as for non – financial companies. Banks are permitted to calculate their own evaluations of the credit risk parameters based on the Basel regulation and under the IRB approach and consequently more precisely align their regulatory capital with the underlying risk in a credit portfolio. There is also another way to manage or handle the credit risk by hedging or trading of the risk.

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There is a numerous growth in the last decades on financial markets with credit derivatives while these derivates are more used for speculation rather than hedging, for which they were mainly designed. These reasons (regulatory as well as speculation on market with derivates) contributed to the formation of new methods for the credit risk estimation. Core components of the credit risk are the Probability of Default (PD) and the Loss Given Default (LGD). These are included in the credit spread, which is the difference in market prices between defaultable and default – free bonds. In the past the attention was paid to modeling and estimating the probability of default while the loss given default was often expected to be constant and exogenously given. This lack of studies on the LGD modeling may be considered mainly due to the fact that the probability of default and the loss given default are difficult to separate based on the price of single financial instrument. (Kollar, Bartosova, 2014)

The article deals with theoretic aspects of Loss Given Default. Credit risk exists in all sectors and companies and this risk has to be calculated and predicted by banks or other financial institution as well as non – financial. So for the calculation of credit risk and especially to predict and calculate losses in case of default of the lender LGD was developed.

2. Credit risk

Financial institutions, banks and also other subjects have been always facing various financial risks. Various financial crisis experienced in the past or recent have shown how important is to predict, estimate and firstly recognize risks properly. Risk management and prediction of potential losses are crucial factor in order to maintain sustainability of business activities of institutions. (Adamko, Kliestik, Birtus, 2014)

Credit risk is just part of financial risk which consists from other types of risks such as economic, financial, technical, political, business or production risk. Financial risk can be defined as the potential financial loss of the company, so not existing or not realized financial loss, but the potential loss in the future resulting from the financial or commodity instrument or from the financial or commodity portfolio. Credit risk than contains the probability of economic losses because of deviations from the credit quality of market members.

In recent years, attitude of banks and other institution to the credit risk has changed. The main tools to moderate credit risk used in the past were collateral and covenants, while nowadays with the development of credit derivatives markets and raise in securitization we can see more opportunities for the banks and institutions in management of credit risk. Second task is that due to the Basel Capital Accord published in 2004 (Basel II), banks were given more edibility concerning the credit risk estimation. While under previous Basel I banks had to use the standardized methodology for calculation of economic capital1, the use of Basel II allows banks to employ their own credit risk models and that leads to better differentiation of risks and to take into account the consequence from diversification of bank's portfolio. (Kollar, Kliestik, 2014)

Techniques used for the estimation of credit risk have changed in recent years, so this has resulted in the expansion of new models for the estimation and evaluation of the likelihood of bankruptcy of individuals or companies and new parameters identifying possible losses. These parameters include *Loss Given Default* and expresses the proportion of an exposure which will not be recovered after defaults of individuals or companies. (Lando, 2004)

3. Loss Given Default

Loss Given Default, is proven in various academic researches, publications or books. The most famous variant of this approach known as LossCals Model is represented and was introduced by Moody´s in 2005. This model is based on the application of multivariate linear regression model which includes certain risk factors, industry and macroeconomic factors, and that includes transformed risk factors. Other famous models were developed by Glossner et al. (2006) and is based on two steps – calibration step and scoring step. The scoring step includes the estimation of a score using collateralizations, haircuts, and expected exposure at default of the loan and recovery rates of the uncollateralized exposure. The score itself can be interpreted as a recovery rate of the total loan but is only used for relative ordering in this case. For computing the distribution of the loss rate depending on the score, this loss rate is approximated by the aggregated exposure of the portfolio up to the score value and the average loss rate of the portfolio.