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Comparison of Current Credit Risk Models

Boris Kollár^{a*}, Barbora Gondžárová^b

^aUniversity of Žilina, Faculty of Operation and Economics of Transport and Communications, Department of Economics, Univerzitná 8215/1,
010 26 Žilina, Slovakia

^bUniversity of Žilina, Faculty of Operation and Economics of Transport and Communications, Department of Economics, Univerzitná 8215/1,
010 26 Žilina, Slovakia

Abstract

The aim of this article is comparison of basic characteristics and mutual comparison of three basic current credit risk models. There is significant importance increase of credit risk issue in global economy and also in business sector nowadays. We chose models of renowned companies - KMV, CreditMetrics and CreditRisk+ as appropriate representatives for this article. We focus on differences in computational procedures, individual credit risk modelling techniques, as well as the variability in input parameters, used for risk quantification. Key dimensions that can be used to compare these models are: risk definition, risk sources, data requirements, credit risk event characteristics, credit event volatility, rate of return, numerical design of model and hazard classification. We will use methods of formal logic such as: analysis, synthesis, deduction, comparison. The result will be comprehensive overview of these models differences as well as the presentation of basic recommendations for their usage along with the mention of their advantages and disadvantages. We will also mention test results of various renowned agencies, which reflect the accuracy of these models.

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1. Introduction

We will focus on the overall summary of essential characteristics and mutual comparison of multiple types of current credit risk models in this article. Among them, we chose Moody's KMV, CreditMetrics and CreditRisk+. Each

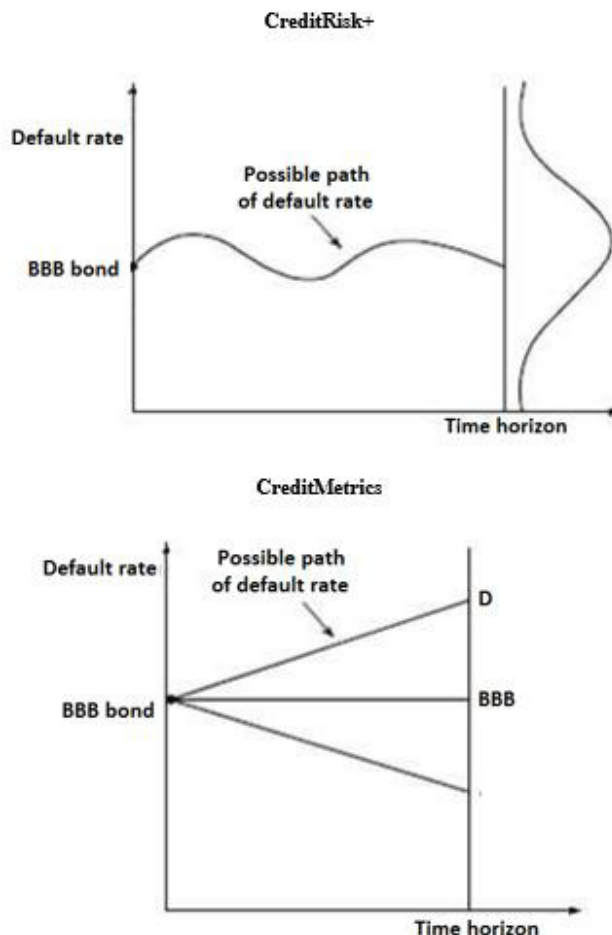
* Ing. Boris Kollár, Tel.: +421-41-513-3227.

E-mail address: boris.kollar@fpedas.uniza.sk

of these models uses different critical computing procedures. Individual techniques of credit risk modelling use variety of parameters in the quantification process (Mišanková, Kočišová & Adamko, 2014). We can compare these models with the use of key dimensions like risk definition, risk sources, data requirements, credit event characteristics, credit events volatility, rate of return, numerical design of model and hazard classification (Saunders & Allen, 2002).

2. Comparison of current credit risk models

One of the distinguishing characteristics of each model, in relation to risk definition, is their distribution between two categories. One category is "default-mode" models group and on the other hand there is "mark-to-market" models group (Cisko & Klieštík, 2013). "Default-mode" models focus on predicting losses caused by default, while considering only two possible states: failure and non-failure. This group contains CreditRisk + and Moody's KMV model (there is also the possibility of extending KMV model, which falls into category of multistate "mark-to-market" models). "Mark-to market" models that contain CreditMetrics methodology are focusing on changes in loan's market value and using rating systems to determine changes in borrower's loan quality. The main difference between these two models is introduction of rating migration in the "mark-to-market" models. The "default-mode" models are instead measured solely by the changes in the debtor's assessment, which arise from its failure. Figure 1 shows and compares possible path of default rate for CreditMetrics and CreditRisk + models (Mišanková & Kočišová, 2014b).



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