Empirical Credit Ratings of Individual Corporate Bonds and Derivation of Term Structures of Default Probabilities

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No doubt, it is important to have an empirically effective credit risk rating method for decision makings in financial industries, business and even government. Here in our own approach, for each corporate bond (CB) and its issuer we first propose a credit risk rating (Crisk-rating) system with rating intervals for the standardized credit risk price spread (S-CRiPS) measure in Kariya et, al (2015, 2016a), where our credit information is based on the CRiPS measure that is the difference between CB price and its GB (government bond)-equivalent CB price. Secondly for each Crisk-homogeneous class obtained through the Crisk-rating system, a term structure of default probabilities (TSDP) is derived via the CB-pricing model proposed in Kariya (2013), which transforms the Crisk level of each class into default probability showing default likelihood over a future time horizon, where 1545 Japanese CB prices as of 2010.8 are analyzed. To carry it out, the cross-sectional model of pricing government bonds (GBs) with a high empirical performance is required to get a high precision of the CRiPS and S-CRiPS measures. The effectiveness of our GB model and the S-CRiPS measure is respectively demonstrated with Japanese GB and US GB prices in Kariya et, al (2012, 2016b) and with evaluation on the credit risk of the GBs of 5 countries in EU and the CBs issued by US energy firms in Kariya et, al (2015, 2016a). Our Crisk-rating system with rating intervals is tested with the distribution of the ratings of the 1545 CBs, with that of a specific agency's credit rating and with that of groups obtained via a 3-stage cluster analysis.

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