

Measurement and Evaluation of Credit Risk in Financial Systems Using Borrowers' Debt Servicing Capacity Indicators

There are growing concerns about evaluating a financial system's capability to withstand risk in the wake of the financial crisis originally triggered by the U.S. subprime mortgage meltdown. In line with this, there have been many efforts at home and abroad such as estimating a model for the probability of default in a financial system and to measure and evaluate credit risk, which makes up a major part of the overall risk facing financial institutions. However, it is difficult to develop a sophisticated model in domestic research, since there has not been a sufficient accumulation of quality data, such as the default rates and borrowers' debt servicing capacity indicators essential for model estimation.

For this reason, this paper develops for the first time in Korea a probability of default model for SME and household loans, by using default rates data acquired from banks as a dependent variable and including some borrowers' debt servicing capacity indicators among the explanatory variables as well as macroeconomic variables. Furthermore, by using the PD model we measure credit risks that may occur in a financial system under a financial stress situation.

According to the estimation results of the PD model, variables related to borrowers' debt servicing capacity, including SMEs' debt to equity ratio and households' real debt to real disposable personal income ratio, are statistically significant at a high level of confidence, and the explanatory power of the model increases substantially when such indicators are added.

In addition, the results of measuring credit risk under a crisis using the estimated model show that a repeat of the Asian Financial Crisis of 1997/98 is estimated to worsen the soundness of SME and household loans, thus, lowering domestic banks' BIS capital adequacy ratio by three percentage points. However, it also predicts that domestic banks can tolerate such a situation, provided the shock episode lasts only one year.

The results presented above suggests the following implications. First, the government, the central bank and the supervisory agencies, which together perform financial stability duties, need to view borrowers' debt servicing capacity indicators as important variables that determine the soundness of the financial system in a crisis and to go on to develop such indicators and monitor them closely. Financial institutions also need to put more emphasis on borrowers' debt servicing capacity in screening loan applications in order to maintain managerial soundness in the event of internal and external economic shocks. Furthermore, micro indicators related to borrowers' debt servicing capacity obtained in the process of screening loan applications need to be widely reflected in developing their PD models to boost their explanatory power.

* The contents of this article represent the personal opinions of the author and do not necessarily reflect the official view of the Bank of Korea.