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PRESS RELEASE

Failure prediction models: performance, disagreements, and internal rating systems *by J. Mitchell and P. Van Roy*

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Failure prediction models are defined as models that assign a probability of failure or a credit score to firms over a given time horizon. The development of the Basel II framework for the regulation of bank capital has stimulated private vendors to offer such models to banks for calculating their regulatory capital requirements. Failure prediction models developed by vendors are often used by banks as an off-the-shelf product or, alternatively, as a basis for development and benchmarking of their internal rating systems. However, little is known about the performance of vendors' models.

This paper addresses a number of comparative questions relating to the performance of failure prediction models for small, private firms. It uses four models, two of which are offered by private vendors, and estimates credit scores or default probabilities for a sample of 36,000 Belgian small and medium-sized enterprises over one- and five- year horizons. It investigates whether some models are better at differentiating defaulting and non-defaulting firms than others, the extent to which different failure prediction models may yield significantly different rankings of risk for the same firm, and the gain that can be realized from combining the predictions of multiple models. The paper also analyzes the design of bank internal rating systems by comparing the performance of systems with differing numbers of classes and distributions of borrowers across the classes.

The analysis reveals that despite differences in statistical methodologies, model input, and model definition of failure, the four models under consideration exhibit similar abilities of detecting defaulters, and all four models perform well at the one-year horizon. Nevertheless, what may appear to be relatively small differences in performance across the models can actually be important. A switch from the least powerful to the most powerful model could produce a substantial monetary gain for a bank, as could combining the output of multiple models. Disagreements across the models in the ranking of firms are also considerable, implying that a bank's choice of model can have a significant impact on its loan pricing and origination decisions. Finally, the number of classes appears to be more important in the design of banks' internal ratings systems than is the distribution of firms across the classes.