Biases in estimating bank loan default probabilities

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Whether motivated by risk management or regulatory needs, banks are keenly interested in accurately estimating the probabilities of default (PDs) associated with their internal rating grades. The quality of these estimates depends critically on the availability and completeness of time series of default and rating data. This paper studies PD estimation when ratings are missing for some obligors and periods in internal data sets. We argue that a within-bank incentive conflict can result in ratings systematically missing for obligors in financial distress. Using internal rating data from a German bank, it is shown that the widely used “cohort” PD estimator, i.e., the long-run average of one-year realized default rates, which simply ignores missing ratings, yields downward-biased PD estimates. Unbiased PD estimators, which account for different missingness mechanisms, are proposed.

1 Introduction
Estimates of average default probabilities (PDs) for obligors assigned to each of a bank’s internal rating grades are crucial inputs to many risk management applications – for example, the pricing of credit assets, from loans to more sophisticated instruments such as credit derivatives, or capital allocation decisions, including management control and incentive compensation systems. The precision of PD estimates is therefore of major importance to a bank’s senior management. Moreover, the proposed new regulation of the supervisory standards for banks’ credit risk capital requirements (Basel II) concentrates the interest of banking supervision on internal ratings. Within the internal ratings-based (IRB) approach, banks are obliged to use the “long-run average of one-year realized default rates” as the estimator for grade-specific PDs (BIS, 2004, §447). Of course, irrespective of the type of estimator used, the availability and quality of time series of internal rating and default data are a central precondition for estimation accuracy.

A recent survey (F.A.Z.-Institut, 2002) documents that almost all of the banks surveyed, which account for over 70% of the German commercial loan market, lack historical data of sufficient quality. In particular, most banks failed to establish standardized procedures for collecting data in the past. The focus of this paper is on one typical consequence of such an omission: the observation that time series of internal ratings show gaps for some obligors of a bank’s loan portfolio.

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