



Editorial

Retail credit risk management and measurement: An introduction to the special issue [☆]

This issue publishes revisions of eight papers that were presented at the Conference on Retail Credit Risk Management and Measurement sponsored by the Research Department of the Federal Reserve Bank of Philadelphia in association with the *Journal of Banking and Finance*. The conference was held on 29–30 April 2003, at the Federal Reserve Bank of Philadelphia, which has a deep interest in furthering knowledge of and spurring interest in issues concerning retail credit markets. The program was organized by Mitchell Berlin of the Federal Reserve Bank of Philadelphia and Loretta J. Mester of the Federal Reserve Bank of Philadelphia and The Wharton School of the University of Pennsylvania. The papers included in this issue have undergone a rigorous review process like the papers published in standard issues of the *Journal of Banking and Finance*. We are very pleased to have served as editors of this issue.

As noted in the first article, “Issues in the Credit Risk Modeling of Retail Markets”, by Linda Allen, Gayle DeLong, and Anthony Saunders, retail credit is typically defined to include consumer credits, such as residential mortgages, auto loans, and credit cards, as well as small business loans – which have features that make them more nearly similar to consumer loans than to large business loans. All of the papers in this issue address a common problem: the existence of large gaps in our quantitative understanding of retail portfolios. These gaps are particularly glaring in light of the Basel II Capital Accord (Basel II), which includes a detailed proposal for setting capital requirements for banks’ retail portfolios. Basel II has generated an active exchange among regulators, bankers, and academic researchers about the appropriate calibration of the capital formulas. Progress on this issue depends crucially on the ability to exploit new sources of data, most of which reside in the data banks of private firms. Many of the conference’s contributions draw upon new proprietary data sets to expand our base of empirical knowledge.

[☆] The views expressed here are those of the authors and do not necessarily represent those of the Federal Reserve Bank of Philadelphia or of the Federal Reserve System.

One of the most difficult questions faced by the designers of Basel II has been: How should the capital formulas take account of correlation among asset returns? Given the central place that this issue holds in any reasonable discussion of capital (which is ultimately held as a buffer against the event of many loans going bad at once), there is a serious lack of empirical evidence concerning the covariance structure of retail portfolios. The issue is complicated by the highly differentiated nature of the retail portfolio; it is reasonable to expect that different assets will exhibit different covariance structures.

The second paper in this issue, “Default Correlation: An Empirical Investigation of a Subprime Lender”, by Charles Cowan and Adrian Cowan, takes a detailed look at the portfolio of a large US subprime lender between 1995 and 2001 to document the empirical significance of common shocks on foreclosures and delinquency rates among subprime mortgage borrowers. Establishing empirical facts about the behavior of subprime portfolios is especially important in light of the extremely rapid growth of subprime lending in the last decade, as well as the common perception that subprime borrowers are likely to be highly sensitive to adverse economic shocks. Cowan and Cowan’s most striking findings are that while borrowers’ *ex ante* riskiness and their default correlation (as measured by foreclosures) are monotonically positively related, this correlation is very low for the least risky borrowers, and it becomes economically significant only for the riskiest borrowers in the portfolio. However, it should be kept in mind that the sample period is a very buoyant period in the US economy, so the results may not generalize to a period with large negative shocks. Indeed, this caveat should be kept in mind for many of the papers in this issue, which use data mainly from a period of economic expansion both in the US and Europe.

The third paper in the issue, “Should SME Exposures Be Treated as Retail or Corporate Exposures? A Comparative Analysis of Default Probabilities and Asset Correlations in French and German SMEs”, by Michel Dietsch and Joël Petey, addresses two main issues. First, it examines the correlation of returns for small business loans in Germany (for the sample years 1997–2001) and in France (for the sample years 1995–2001). Second, it compares small firms to large firms to ascertain whether the differences in the covariance structures of large and small business portfolios support Basel II’s approach of treating the portfolios separately. Interestingly, and unexpectedly, the authors find that asset correlation is lower, on average, for small businesses than for large businesses. Within the small-business loan portfolio in Germany, default correlation increases with firms’ credit risk, but in France, default correlation exhibits a U-shaped relationship to firms’ credit risk. On the one hand, Dietsch and Petey’s results provide support for Basel II’s separate treatment of small business and large business portfolios because default correlation is lower for small businesses. On the other hand, their results conflict with the Basel II formulas for small-business loans, which imply a negative relationship between credit risk and default correlation.

The next two papers in the issue explore other calibration issues. “Economic and Regulatory Capital Allocation for Revolving Retail Exposures”, by Roberto Perli and William Nayda, uses a sequence of models of increasing complexity to explore

Basel II's capital formula for credit card portfolios, especially the adjustment for future margin income. In general, the current formula permits banks to subtract 75% of expected losses, recognizing that credit card margins are set to cover a significant portion of expected losses. The authors then construct sample portfolios from different risk segments of Capital One Financial Corp.'s credit card portfolio, which they use to calibrate and calculate capital requirements for each of their models. Perli and Nayda's approach is attractive because it pushes the boundaries of analysis beyond Gordy's workhorse single-factor model. The Gordy model (as described in Gordy, M.B., "A Risk-Factor Model Foundation for Ratings-Based Bank Capital Rules", *Journal of Financial Intermediation*, 2003) is the theoretical underpinning for most of the papers presented at the conference. Indeed, Perli and Nayda's two-factor model – which permits time-varying probability of default – yields significantly different capital requirements both from their one-factor model and from the Basel II formula. Specifically, the two-factor model yields capital requirements that are lower than either Basel II or the one-factor model for low-risk segments of the portfolio and that are substantially higher than Basel II or the one-factor model for high-risk segments. Echoing the results of the previous two papers in this issue, their two-factor model suggests that the correlation of returns is greater for riskier segments of the portfolio. They also find that revenue is more volatile for higher risk segments, partly because revenues are more sensitive to macroeconomic conditions for higher risk segments.

A key input into the Basel II formulas is the loss given default for an asset, i.e., the portion of the asset's value that the lender would not recover when the borrower defaults. Yet, our empirical knowledge of the loss-given-default for different assets – which depends to a significant extent on the value of collateral – is very rudimentary. "Credit Risk in the Leasing Industry", by Mathias Schmit, begins to fill this large gap in our knowledge by providing detailed information about the recovery value for different types of leased assets. The data set is constructed from the portfolio of a large European leasing company, which includes over 45,000 leasing contracts between 1990 and 2000. One of Schmit's most striking results is that there is wide variation in the recovery value for different types of lease contracts. Considering the resale value of leased assets alone, i.e., leaving out other sources of recovery, the collateral value ranges from 34% for office equipment and computer leases to 69% for automobile leasing. (Although Schmit is primarily interested in the regulatory implications of the recovery value, these data have independent interest for scholars interested in secured lending or capital structure.) When other sources of recovery are included, the recovery values range from 45% for office equipment and computers to 80% for automobile leasing. These results suggest that there is a strong economic incentive for firms to use the advanced internal-ratings-based (IRB) approach in determining capital requirements – and thus, to incorporate their own estimated loss-given-default. The results also suggest that standardized formulas will overestimate loss-given-default for many classes of leased assets.

Credit scoring has proven to be a low cost and effective method for lenders to substantially expand their retail portfolios without incurring excessive credit risk. Indeed, the use of credit scoring techniques has been successfully extended beyond consumer loans to small business loans, as noted by Allen, DeLong, and Saunders (in this issue).

While the success of credit scoring models in predicting future delinquencies is well documented, the next two papers in the issue explore well-known, but as yet unexplored, statistical issues concerning the use of credit scoring techniques. “Consumer Credit Scoring: Do Situational Circumstances Matter?” by Robert Avery, Paul Calem, and Glenn Canner, uses a large random sample of credit histories from one of the three US credit reporting companies. They ask whether taking account of local economic shocks or other shocks to an individual’s economic well-being – such as a divorce – might improve the performance of standard credit scoring models. They find that including situational factors does improve the performance of credit scoring models. For example, the credit score for an individual from a strong local economy – measured by the local unemployment rate – will overstate his or her creditworthiness, while the score for an individual who recently divorced – proxied by a shift from joint account to single account status – will understate his or her creditworthiness. While the authors have identified a potential area for improvement of credit scoring models, they note that it is unclear whether private firms would find it profitable to incorporate the additional information into their scoring models.

The next article, “Does Reject Inference Really Improve the Performance of Application Scoring Models?” by Jonathan Crook and John Banasik, explores selection bias in credit scoring models. The selection bias arises because credit scoring models are estimated using samples composed only of individuals who have successfully applied for credit in the past; those who have been denied credit never appear in the sample. Crook and Banasik use an unusual proprietary data set in which the lender assigned credit scores to a sample of applicants, but instead of making an accept/reject decision, accepted essentially all applicants. Using this sample, the authors analyze the extent to which applicants would have been misclassified because of selection bias for any given credit-score cutoff. They do this both for a standard credit-scoring model and for a credit-scoring model estimated using reweighting, an ad hoc technique used by lenders to mitigate selection bias. This exercise is repeated for different hypothetical cutoff levels. Using a number of different metrics, Crook and Banasik find that the actual effect of selection bias is relatively small; i.e., the potential gains in accuracy from using the full sample instead of the censored sample are relatively small. Further, reweighting techniques do not appear to reduce selection bias and actually worsen the problem for high cutoff levels. Finally, the potential gains grow smaller as the acceptance cutoff level declines.

The rapid growth in volume in retail markets would have been impossible without the widespread securitization of retail assets, especially credit card receivables. The technology of securitization yields efficiencies by permitting firms with a comparative advantage in origination to specialize in this task, while designing differentiated claims that will be attractive to a wide range of funding intermediaries. Of course, separating origination from funding generates potential agency problems, especially since under current regulations, the originator must forgo any promise of recourse to the provider of funds for the securitized asset to qualify as a sale and, thus, to qualify for favorable capital treatment.

The final paper in the issue, “What Is the Value of Recourse to Asset-Backed Securities? A Clinical Study of Credit Card Banks”, by Eric Higgins and Joseph

Mason, examines one mechanism that banks have used to overcome this agency problem: the provision of implicit recourse, i.e., implicit promises by the originator to bail out troubled asset-backed securities. Higgins and Mason examined 17 instances between 1987 and 2001 by 10 separate credit card banks in which the originator provided recourse to a vehicle suffering severe credit problems. The authors examine these events from a number of different angles. These include the market responses to the provision of recourse, the long-run performance of the credit card bank providing recourse, and the structure of securitization agreements designed subsequent to the recourse event. The weight of the evidence suggests that the provision of recourse is associated with temporary, but not permanent, asset quality problems at the originating bank. Further, recourse is viewed favorably by the market. Banks that provide recourse experience positive excess returns, and the only penalty imposed by the market appears to be a (modest) waiting period before the originating bank can securitize new assets.

The aim of our 2003 conference was to assess the state of knowledge of the management and measurement of retail credit risk, generate new results in this relatively under-researched area, and determine directions for further research. Its success should be judged by the papers in this issue, which provide significant new quantitative knowledge about retail portfolios that should be of value to researchers, market participants, and regulators.

Mitchell Berlin

Research Department

Federal Reserve Bank of Philadelphia

Ten Independence Mall

Philadelphia, PA 19106-1574

USA

Tel.: +1-215-574-3822; fax: +1-215-574-4303

Loretta J. Mester

Research Department

Federal Reserve Bank of Philadelphia

Ten Independence Mall

Philadelphia, PA 19106-1574

USA

Tel.: +1-215-574-3807; fax: +1-215-574-4303

E-mail address: loretta.mester@phil.frb.org

The Wharton School

University of Pennsylvania

Philadelphia, PA 19104

USA