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PRESS RELEASE

Sector Concentration in Loan Portfolios and Economic Capital

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The failure to account for diversification within banks' credit portfolios was a key criticism of the rules for determining minimum capital requirements specified in the 1988 Basel Accord. At the same time, the minimum regulatory capital requirements formulated in Pillar 1 of the Basel II Framework of June 2004 still do not differentiate between portfolios with varying degrees of diversification. However, the Basel II framework does recognize that banks' portfolios can potentially exhibit credit risk concentrations, and this risk is to be addressed in the supervisory review process, which constitutes Pillar 2 of the framework. In light of these observations, this paper addresses two questions. First, would greater concentration of loans by business sector cause the economic capital (defined as value-at-risk minus expected loss) associated with a bank's loan portfolio to increase significantly? Second, are simple analytical techniques available for measuring the economic capital corresponding to differing levels of business sector concentration in banks' portfolios?

In order to measure the impact of concentration risk on economic capital, we simulate economic capital for a series of loan portfolios, where the sectoral distribution of exposures in the benchmark portfolio reflects the average sectoral distribution of loans in the German banking system. Since this sectoral distribution is similar to that in Belgium, France and Spain, the simulation results should also hold for other European countries. Starting with the benchmark portfolio, six subsequent portfolios are constructed, by successively increasing the concentration of loans in one particular sector, up to a total concentration of loans in this sector in the sixth portfolio. The intermediate portfolios are constructed in such a way that two of these portfolios mirror the sectoral compositions of the corporate loan portfolios of actual German banks. We find that economic capital computed by Monte Carlo simulations increases for the intermediate portfolios by up to 37 p.c. compared with the benchmark portfolio and moves even higher for the single-sector portfolio. This result continues to hold in a number of robustness tests thereby highlighting the necessity to account for sectoral concentration in the measurement of credit risk.

Given that concentration in business sectors can substantially increase economic capital, it would be desirable to find an analytical method for calculating economic capital which avoids the use of computationally burdensome Monte Carlo simulations. In this context, we evaluate the accuracy of a model proposed by Pykhtin (2004) which provides an analytical approximation of economic capital in a multi-factor framework, thereby allowing effects of sectoral concentration to be incorporated. We develop a simplified, version of the model, which requires as inputs data that are regularly available to banks and regulators. We compare the economic capital values obtained with Pykhtin's method with the simulation-based estimates for each of the portfolios. We find that Pykhtin's method performs well in comparison with the Monte Carlo simulations. This is an important result, as it suggests that supervisors and banks can approximate the economic capital for their credit portfolios reasonably accurately using a relatively simple formula and without employing computationally burdensome Monte Carlo simulations.