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Measuring Integrated Market and Credit Risk in Bank Portfolios: The case of the Saudi Banks

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Abstract

Banking failures and systemic banking problems are reasonably frequent and very costly events around the world. The measuring of the risk exposure of a bank is one the main hurdles for bank managers as well as for bank regulators. To deal most effectively with such risk analysis it is necessary to integrate market, credit, and other risks. However, this is a difficult modeling problem. Barnhill and Maxwell (2000) developed a simulation model for estimating correlated market and credit risk. Absent such an integrated risk assessment approach, important correlations are not accounted for properly and overall risk levels are miss-estimated, which might create problems when determining capital adequacy requirements.

This paper employs the Portfolio Simulation Approach of Estimating Integrated Market and Credit Risk to accomplish two goals: to measure the risk level of Saudi banks' asset and liability portfolios and to assess the risk of correlated failure among the largest three banks in Saudi Arabia. When calibrated with data from Saudi Arabia, the simulations produce a credit transition matrix similar to that reported by a

single Saudi bank. It is also shown that simulated mean returns for Saudi banks are generally comparable to historical returns. Further, the simulated volatility of returns are similar for some banks and not similar for others. These results support the belief that simulated capital ratios, single bank default rates, and multiple bank default rates are reasonable estimates for at least a portion of bank studies. The simulation results indicate a potential financial difficulty for only one major Saudi bank. However, the simulation results also indicate a very low systemic risk for three of the largest banks in Saudi Arabia. In addition, the simulated model captures the effect of Islamic banking activities, with an acceptable simulated mean return on equity and a simulated mean return on assets, for Rajhi Bank. Thus, one can argue that Islamic banking risks and conventional (Western) banking risks can be measured with the same tool.

In conclusion, the results of this paper may assist both bankers and international regulatory bodies, such as the BIS, in their efforts to establish appropriate capital requirements around the world.

Keywords: Market risk, Credit risk, integrated risk, Saudi Arabia.