

**PREDICTING THE FINANCIAL STABILITY OF RURAL BANKS  
USING PRINCIPAL COMPONENT ANALYSIS AND  
MULTINOMIAL LOGISTIC MODEL**

KRISTIN D. SORIANO

A Special Problem Submitted in Partial Fulfillment

Of the Requirements for the Degree of

MASTER OF STATISTICS

SCHOOL OF STATISTICS

University of the Philippines

Diliman, Quezon City

December 2014

## **ABSTRACT**

Financial institutions need to maintain public's confidence to ensure a healthy financial system. Thus, financial stability of banks is a major concern for regulators, including rural banks, considering that this type of bank has the widest reach among other types of banks.

This study shows how financial ratios and indicators are used in predicting the operating status of rural banks. Results show that there are 13 financial indicators which are least likely to be subjected to examination adjustments. These are capital to asset ratio, cost of funding, loan yield, interest income to average assets, interest expense to average assets, net interest income to average assets, liquid assets to total liabilities, capital to loans, efficiency ratio, specific provision to non-performing loans (NPL), stress-tested capital to asset, interest income to interest expense, and liquidity exposure. These selected indicators are used in multinomial logistic regression to predict the operating status of rural banks: one approach considers the indicators in their original form, and another uses the principal components obtained from the indicators. Results show that the use of principal components provides a more accurate classification of rural banks in sample. Moreover, the principal components retained in the model can be interpreted, not only as reflection of the bank's financial condition, but also of management's strategic directions, market conditions and management of key risk areas, which serve as early warning signs to regulators. The components retained in the model are consistent with the observations in management practices in on-site and off-site supervision.