Estimating the Probability of Default under IFRS9 using Non-Performing Loan Ratios and Macroeconomic Forecasts

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Abstract

This paper proposes a creative solution for estimating the multi-period forward-looking probability of default for determining expected credit losses imposed by the IFRS 9 standard. The suggested approach scales transition matrices by an economic adjustment factor. While the application of transition matrices is not a new concept in credit risk modelling, integrating macroeconomic information into this model proves be a challenge and hence is an emerging area of interest. The proposed approach derives an economic adjustment factor by forecasting the non-performing loans (NPL) ratio using macroeconomic variables. The forecasted NPL is then transformed into an economic adjustment factor and applied to the default transition probabilities. This paper examines several transformations from predicted NPL to economic adjustment factors: the ratio of forecasted NPL to the initial NPL, the ratio of forecasted NPL to the prior period and the ratio of forecasted NPL to the long run average NPL. Several methods for calibrating the initial transition matrix were also considered totalling 12 different approaches evaluated. The proposed framework is applied to Puerto Rico's publicly available housing market data obtained from Fannie Mae.

Leveraging the behavior of a financial institution's NPL ratio provides additional options for modeling credit risk behavior. This paper is of particular interest for financial institutions in emerging and developing countries where lengthy historical default data is not readily available. This solution is also attractive to financial institutions with limited availability of credit variables as the NPL ratio is a widely reported metric across the financial industry.

Keywords: credit risk, IFRS 9, economic adjustment, probability of default, markov chains, forward looking information