DEFAULT NUMBER PREDICTION IN JAPAN BY FINANCIAL/ECONOMIC INDEX AND GRANGER CAUSALITY

Tadashi ONO, Professor
Faculty of Business Sciences
University of Tsukuba
ono@mbaib.gsbs.tsukuba.ac.jp

This study develops a multi-regression model for predicting default numbers in Japan using data for 16 years. In the single regression analysis, we determine that 10 variables (using financial/economic index) have a relatively strong predicting power. Using these 10 variables, we derive a multi-regression model with five explanatory variables: TIBOR-Call spread, Yield curve spread, CP-Call spread, TIBOR-TB spread, and Stock market crash.

This model has strong explanatory power (Adj. R^2 = 0.881). By factor analysis of 10 variables, we find two factors that influence the variables: interest rate spread factor and volatility factor. In a Granger causality analysis of 8 variables and the dependent default number, we find the cause–effect chain in the liquidity crisis starting from yield curve spread to default number. That is, a change in the yield curve spread causes changes in financial institutions' short-term interest rate spread (e.g., TIBOR-TB spread and TIBOR-Call spread) and these changes cause a change in general corporations' short term interest rate spread (CP-Call spread). The super short interest rate of repo spread has a feedback effect with TIBOR-related costs.

Then, CP-Call spread, Repo spread, and Stock market volatility have a direct impact on the default number. Additionally, we find that some spiral reverse impact exists in the liquidity crisis; that is, the default number increase reversely impacts the widening TIBOR-Call spread and increasing stock market volatility.
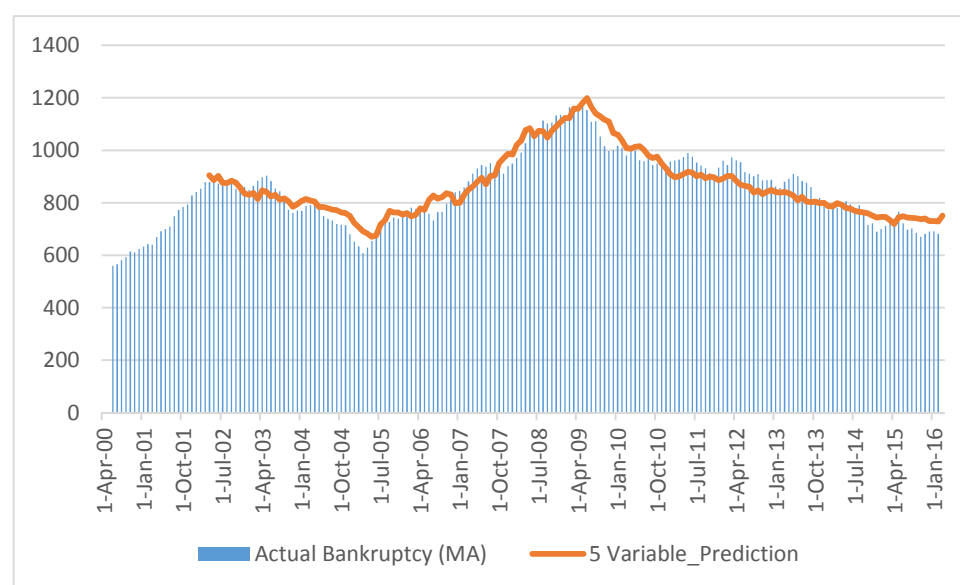

Figure . Model predicting result (line) and actual number of monthly default (moving average, bar) (Adj. R^2 = 0.881).