FORECASTING LIKELIHOOD AND SEVERITY OF RECESSIONS IN INDIA: A LEADING INDICATOR APPROACH

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ABSTRACT

This study develops a two-step machine learning-based framework to forecast the likelihood and severity of recessions in India. The first step predicts the probability of a recession using binary classification, and the second step, conditional on a predicted recession, classifies its severity into three categories using multiclass classification. A diverse set of machine learning models was applied across multiple forecast horizons (3, 6, 9, and 12 months) using an in-sample and out-of-sample evaluation strategy. Key macroeconomic indicators, including the 10-year–1-year government bond yield spread, 1-month weighted call money rate, WPI fuel inflation, and non-oil export, emerged as consistent and significant predictors. Sub-sample analysis confirmed that the inclusion of the Purchasing Managers' Index (PMI) enhanced forecasting performance particularly for predicting severity of recession in 6-, 9-, and 12-months ahead horizons. Robustness checks using alternative severity categorizations confirmed the stability of the model. Machine learning-based classification indicated that India is currently experiencing a recessionary phase and the recession is likely to persist in the near future but remain mild, with an expected severity range between +2% and -5%. The findings highlight the effectiveness of machine learning in providing early and reliable insights into economic downturns, thereby supporting timely and targeted policy interventions.

Keywords: Business Cycle, Machine Learning, Leading Indicators, India