Abstract

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Forecasting and modelling techniques in macroeconometrics have changed through the years to cope with the complexity of macroeconomic systems. Recent results show evidence that non-parametric models such as machine learning are helping with the prediction of macroeconomic variables. On the other side, high-frequency information is widely used to provide an accurate source of information for structural analysis. This thesis contributes to all these aspects by proposing innovative techniques for forecasting macroeconomic indicators and providing alternative approaches to evaluate structural relations in macroeconomics. We first exploit the ability of an ensemble learning model combining long-short-term memory neural network (LSTM) and dynamic factor model (DFM) to detect nonlinearities in the US GDP forecast. We also provide an interpretable methodological framework that uses Shapley values to generalize the data-generating process learned by neural networks and apply it to predict inflation levels. In addition, we propose a new identification method for Structural Vector Autoregressive (SVAR) models based on nowcasted (high-frequency) macroeconomic data.