



Large Vector Auto Regressions

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One popular approach for nonstructural economic and financial forecasting is to include a large number of economic and financial variables, which has been shown to lead to significant improvements for forecasting, for example, by the dynamic factor models. A challenging issue is to determine which variables and (their) lags are relevant, especially when there is a mixture of serial correlation (temporal dynamics), high dimensional (spatial) dependence structure and moderate sample size (relative to dimensionality and lags). To this end, an \textit{integrated} solution that addresses these three challenges simultaneously is appealing. We study the large vector auto regressions here with three types of estimates. We treat each variable's own lags different from other variables' lags, distinguish various lags over time, and is able to select the variables and lags simultaneously. We first show the consequences of using Lasso type estimate directly for time series without considering the temporal dependence. In contrast, our proposed method can still produce an estimate as efficient as an \textit{oracle} under such scenarios. The tuning parameters are chosen via a data driven "rolling scheme" method to optimize the forecasting performance. A macroeconomic and financial forecasting problem is considered to illustrate its superiority over existing estimators.

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