

Forecasting Immigration Trends with Bayesian Structural Time Series Models

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Historically, statistical forecasts of immigrant and non-immigrant application receipts and approvals have been accomplished through Box-Jenkins/ARIMA models based solely on the previous observations of the forecasted series. These time series provide valuable forecasts but are incapable of informing policy decisions. Questions regarding the impact will an increase in the application fee or the hiring of additional processing staff are neglected by solely examining previous observations of applications or approvals.

We employ a structural time series model which includes several policy dimensions and administrative controls to predict the receipt of applications for naturalization and legal permanent residence in the U.S. In particular, we test to see if application price, administrative work hours, application pool size, and policy shifts can improve out-of-sample predictions. We employ Bayesian estimation because of its statistical advantages in dealing with unit roots and in order to assess the reasonableness of using semi-informative priors to inform the prediction error component.