Econometric Forecasting: It's Still Hard to Beat Those AR Models

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In forecasting macroeconomic variables one has many possible types of models to choose from: error correction models, vector error correction models, autoregressive conditional hetero-skedasticity (ARCH)-based models, full econometric systems, nonlinear models, or various possible combinations. But, as most forecasters know, it's difficult to forecast the macroeconomy and, despite decades of effort, researchers find it surprisingly hard to find new models that outperform the simple Box Jenkins-type autoregressive (AR) models. In this note, I review some recent research papers by authors who test different types of forecasting models that try to do just that.

Econometric models may be built for purposes other than forecasting, like providing a plausible description of the economy for policy simulations or answering other research questions. But here I am only concerned with the forecasting aspect. So, for a model to "perform better" than another, I refer to the standard performance criteria: having the smallest forecast errors which are measured by root mean forecast errors (RMSEs) in forecasting out-of-sample periods.

Clements and Hendry (2001) provide an excellent summary of the issues in econometric forecasting. They point out three key facets of the economic forecasting problem, namely that[1]:

- "economies are nonstationary processes which are not reducible to stationarity by differencing, thereby generating moments that are non-constant over time"
- "some models are relatively robust to deterministic shifts, either by transforming them into 'blips' or by adapting rapidly to them"
- "most measures of forecast accuracy are not invariant under data transformations"

A common problem arising from the inherent nonstationarity of economic data is breaks or shifts. This tends to make an otherwise very useful class of models, error correction models not perform all that well for forecasting. Clements and Hendry (2001) show that VARs or simple univariate models like simple AR models, are often more robust to shifts or breaks in trend. They argue that this is because simpler models are often more adaptable, and that it is adaptability that is really desirable in models, not just simplicity, although simple models are often more adaptable. This is perhaps the key to why AR models tend to beat models that incorporate causal economic relationships and are otherwise much more realistic than the atheoretic AR models.

In recent history, a major structural break that occurred in many economic time series is often called the "Great Moderation." This refers to a large decrease in volatility in many macroeconomic variables in the US and other countries. Since the mid-1980s, there was a

[1] See page 10.


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