

Nowcasting and the Use of Big Data in Short-Term Macroeconomic Forecasting: A Critical Review*

Pete Richardson

Key Question

With the exponential growth of data storage and processing capacities over the recent past, the availability and use of so called “Big Data” sets – encompassing those from Internet search, social media and financial transactions systems – have become increasingly feasible for economists and other analysts. A number of recent empirical studies, mostly post-crisis, have therefore explored the potential use of such data, which are typically wider and timelier than those traditionally provided by the National Statistical authorities, as tool for macroeconomic forecasting. Nonetheless there appear to be relatively few systematic reviews of related empirical work to date.

This review seeks to redress the balance by providing a discussion of the relevance of Big Data for economic forecasting and a critical review of a number of empirical studies published to date, drawing on a number of different sources, including internet searches (notably Google), social media (Twitter) and financial transactions-related statistics. It does so primarily from a practical economic forecasting perspective looking at studies over a range of topics including labour markets, consumer spending, trade, tourism, inflation, financial markets and overall macroeconomic activity.

Main Results and Message

The range of available empirical studies reviewed provides interesting insights and evidence of significant correlations and predictive performance across a range of topics. Broadly speaking the results are however generally quite mixed, reflecting both the relative simplicity of the models used and important limitations in terms of quality, form, sample sizes and their qualitative nature. The most successful applications appear to be those which seek to embed this class of information within a coherent economic framework, as opposed to a naïve black box statistical approach. In these respects more needs to be done:

- To refine and improve the quality standards for available Big Data sets and their accessibility;
- To provide better methods for extracting information relevant to specific fields of economic research;
- To improve the means of comparing and testing between alternative measures;
- To further adapt and improve relevant testing and modelling frameworks suitable for incorporating near-term information in short-term macroeconomic forecasts.

Nonetheless, there are some clear examples where such indicators could usefully augment existing nowcasting and other indicator-based approaches as part of the general selection of variables to be analysed and as such they provide a welcome addition to the economist's and statistician's toolkit for short-term economic analysis.