Analysis

New tools for monitoring the economy

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There is an increasing amount of information and tools available for the evaluation of the state of and developments in the economy. At the same time, economic decisions increasingly require the support of real-time information. Official statistics provide reliable information on the overall state of the economy, but these statistics are published with a considerable time lag. For example, the most recent official GDP statistics provide a picture of the economy in the previous 2–5 months.



In recent years, many new methods have been developed for the utilisation of large data sets, and they can also be used for monitoring the current state of the economy and for short-term forecasting. These methods include nowcasting models, i.e. short-term forecast models that utilise data with short publication lags from a number of sources to generate an overall picture of the state of the economy.

In terms of forecasting, the advantage of a large group of variables is that it dampens random variation, i.e. the noise in individual statistical releases. The time series of each variable consists of

variable-specific variation and variation related to the economy as a whole. In the examination of a large group of variables, the aim is to dampen variable-specific variation to enable the examination of the factor that explains the covariation of the group of variables. This factor reveals the state of the economy. An analysis of a large group of variables by means of a statistic model, however, involves a challenge, as it increases parameter estimation uncertainty. Economic forecasting that utilises a large group of variables requires the application of tailored methods.

The Bank of Finland has developed a new short-term forecasting model which is suitable for processing continuously updated data. The model is a large Bayesian vector autoregressive model. The key idea is to utilise statistical interdependencies between different variables and use them for forecasting the development of GDP in the most recent quarters. The model comprises nearly 50 variables. They include, for example, labour market variables, confidence indicators and sector-specific cyclical indicators and turnover data.[1]

At the time of writing this article, the statistical release on fourth quarter 2017 GDP was not yet available, whereas statistical releases on a large group of monthly variables are already available even for the present quarter. These data include, for example, confidence indicator values for October and November and employment statistics for October. The model generates a forecast of GDP developments in the present quarter that is conditional on the statistics already published. The GDP forecast is updated in accordance with deviations from the anticipated data in new statistical releases.

The following example illustrates the functioning of the nowcasting model (Table 1). According to the October 2017 statistical release, the unemployment rate is 8.1%, which is 0.2 percentage points lower than anticipated. As a result, GDP growth forecasts will be revised upwards, because the forecast errors for GDP growth and unemployment are, on average, negatively correlated. For updating the forecast based on new information, the model uses Kalman filtering. The forecast is updated via mathematical equations based on statistical probabilities.

The nowcasting model also enables evaluation of the significance of new statistical releases. As the GDP growth forecast is updated based on deviations of statistical releases from the expected, only the unanticipated information is of significance. Even a large decrease in e.g. unemployment increases the GDP growth forecast only to the extent that the decrease is unanticipated. The significance of statistical releases depends also on the amount of random variation – i.e. noise – in the time series. For example, large occasional peaks are often observed in the releases of new orders in manufacturing, and therefore it is difficult to conclude, based on the amount of new orders, whether the changes reflect a turn in the economy or other factors.

Table 1.

An example of news analysis in the nowcasting model					
					Impact on GDP forecast
Variable	Month	Actual	Forecast	News	17/IV
Unemployment rate, %	October	8.1	8.3	0.2	0.2
Job vacancies, % change	October	0.5	0.6	−0.1	−0.1
					GDP forecast
		Before new statistical releases			1.2
		After statistical releases			1.3

The Bank of Finland has published a new website (in Finnish) for nowcasts prepared with the new nowcasting model and the statistical releases on which the nowcasts are based. The website makes it possible to monitor how the nowcasts of GDP growth have evolved over time as new statistical releases have become available. The model calculations facilitate the monitoring of the economy and reveal which statistical data are significant for our overall picture of the economy.

Notes

1. For a more detailed description of the model, see Itkonen, J. and Juvonen, P., 'Nowcasting the Finnish economy with a large Bayesian vector autoregressive model'. Bof Economics Review 6/2017 ↑

Keywords

economic forecast, forecasting models, gross domestic product, indicators, nowcasting, statistics