



## Nowcasting global economic growth

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*This letter presents the findings of research carried out at the Banque de France. The views expressed in this post are those of the authors and do not necessarily reflect the position of the Banque de France. Any errors or omissions are the responsibility of the authors.*

*Global economic growth has a strong bearing on the pace of activity in the euro area and in France. The IMF provides an assessment of the global economy in its World Economic Outlook report, which is published twice yearly. In between these publications, however, a variety of more volatile factors can affect the international economy. It is therefore important for central banks to monitor ongoing fluctuations in global growth by looking at macroeconomic and financial indicators released at different frequencies. This process, known as nowcasting, is a recent concept which differs from standard economic forecasting.*

### What is nowcasting?

The macroeconomic concept of nowcasting has been popularised recently by various researchers and forecasters, and differs from standard forecasting in that it involves assessing the real-time performance of an economy. Establishing a precise diagnosis of the current state of the economy is often regarded as a first step towards building a longer-term outlook. However, the task is particularly challenging as most countries publish their national accounts – especially the benchmark macroeconomic indicator, gross domestic product or GDP – after the close of the period, and often with a significant lag. In the euro area, for example, Eurostat publishes its flash estimate of GDP growth around 42 days after the end of the quarter.

Economists looking at first-quarter economic activity in the euro area thus have no official estimate of GDP from 1 January to 12 May. In the interim, however, they have access to variables released at a higher frequency, i.e. on a monthly, weekly or daily basis.

Evaluating first quarter GDP growth in the period between 1 January and 31 March is thus a form of nowcasting,<sup>1</sup>

and is made complicated by the fact that data are revised from one publication to another, and by the constant flow of new data released at different frequencies.

Academic literature has taken an interest in nowcasting, and there have been various recent studies of the concept, notably along the lines of Reichlin (L.) and his co-authors (see Giannone *et al.*, 2008, in particular, in an article in the *Journal of Monetary Economics*<sup>2</sup>).

Forecasters have also turned their attention to the issue and developed tools for nowcasting. The US regional Federal Reserve banks use the concept frequently as part of their economic monitoring: the Atlanta Fed, for example, has developed a nowcasting tool called GDPNow, which is updated weekly to provide an estimate of national GDP growth for the current quarter, right up to the publication of official figures;<sup>3</sup> the Cleveland Fed, meanwhile, has put together an inflation nowcasting tool

1 Evaluating the first quarter over the period from 1 April to 11 May is sometimes referred to as “backcasting”.

2 <https://ideas.repec.org/a/eee/moneco/v55y2008i4p665-676.html>

3 <https://www.clevelandfed.org/inflation-central/nowcasting.cfm>

which provides daily estimates of the monthly Personal Consumption Expenditure index (PCE, targeted by the FOMC) and Consumer Price Index (CPI).<sup>4</sup>

## IMF estimates of annual global GDP growth for the current year

Although nowcasting global economic growth is a complicated exercise, it is crucial for monitoring the international economic environment and for formulating international economic policy recommendations, notably within the framework of the G20.

There is currently no global statistical institute charged with providing official national accounts aggregated at a global level, despite recent efforts in this direction coordinated by international institutions. The main variable used to evaluate global economic activity is the data provided by the IMF in its twice-yearly report on the world economy, i.e. the *World Economic Outlook* or WEO.

The WEO provides an estimate of annual global GDP growth for the current year (nowcast), and for forthcoming years (forecasts), which is regarded as a benchmark by macroeconomists. The figures are released quarterly (full WEO reports in April and October and updates in July and January). With each successive publication, previous IMF nowcasts are revised until the final figure for growth is obtained a few months after the close of the period (see Chart 1).

For analysts who monitor real-time global economic conditions, it is unfortunate to have to wait for the WEO reports in order to have an assessment of the global

economy. Indeed, countries produce a wealth of economic data at much higher frequencies (for example survey data, figures on output and sales, and financial figures, which are published on a monthly, weekly or daily basis). The research presented in this *Rue de la Banque* takes a closer look at this dual issue, that is how to summarise this huge volume of monthly data in order to nowcast annual global GDP growth (Ferrara and Marsilli, 2014).

## Construction and evaluation of a new tool for modelling real-time global growth

In this article, we propose a new modelling tool known as a mixed frequency factor model (FA-MIDAS), which combines recent econometric techniques.

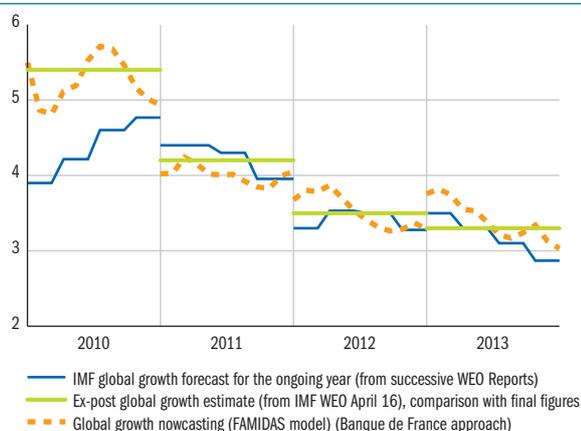
First, we use an extensive database containing monthly data for 37 countries, which together account for some 80% of global GDP. For each country, we use real economic data, financial data and opinion-based surveys. The data include variables such as industrial production, new car registrations, business climate surveys and household confidence, as well as stock market prices for the world's leading economies. We also take into account global variables such as oil prices or the Baltic dry index, a proxy for global trade, and ultimately obtain a database containing over 400 series.

Our mixed-frequency factor approach consists of two steps. First, we reduce the size of our initial database of monthly variables using a dynamic factor model: the initial variables are combined linearly to obtain an estimate of a monthly factor that is supposed to represent the co-movement of the entire dataset (see Barhoumi, Darné and Ferrara, 2013, for a review of the recent literature). This estimated factor reflects the common dynamic of all the variables, and all other variations are assumed to be idiosyncratic. Second, we apply a mixed-frequency linear regression in order to explain annual growth in global GDP by this common monthly factor. To switch from a monthly frequency to an annual frequency, we use a model from recent research (a Mixed Data Sampling or MIDAS model; see, for example, Ghysels *et al.*, 2007), which enables a low-frequency variable (annual in this case) to be explained by a high-frequency variable (monthly), within a parsimonious framework.

Using this nowcasting or factor-augmented MIDAS approach, we obtain a new current year growth estimate each time the monthly variables are updated, from January (11-month horizon) to December (zero horizon).

### C1 Change in world GDP growth nowcasts (2010-2013)

(yearly growth rate in percent)



Source: Banque de France.

4 <https://www.clevelandfed.org/inflation-central/nowcasting.cfm>

Our study then evaluates the performance of the model for the post-crisis period from January 2010 to December 2013. Our monthly forecasts are compared with: (i) the nowcasts from the WEO reports of the time; and (ii) WEO ex-post estimates (from April 2016). Chart 1 shows that our approach (dotted line) is a good predictor of global growth, and that our figures tend to converge towards those of the IMF. Further measurements show that, on average, our estimates are more accurate than those of the IMF, in particular for the first part of the year when there is very little information available from the national accounts. Aside from the quality of the estimates, our nowcasting approach is a good indicator of real-time global economic growth, and can easily be updated.

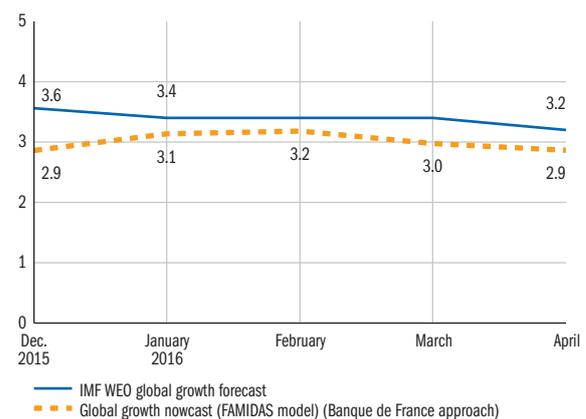
## Comparison with IMF nowcasts for 2016

Using this tool, we carried out a real-time analysis, recalculating the indicator for global growth each month. For 2016 (see Chart 2), our results point to a less optimistic forecast than that released by the IMF in its latest WEO report, despite significant downward revisions. Our most recent real-time estimate (using data available at 4 April) points to annual global growth of around 2.9%.

The IMF's latest 2016 global GDP growth estimate of 3.2%, published in its 12 April WEO report, could therefore be revised downwards again in the coming months, taking it to its lowest level since 2009.

## C2 Real-time evolution of nowcasts for 2016 global GDP growth

(in %, data available at 4 April 2016)



Source: Banque de France.

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