

[Uncertain Kingdom: Nowcasting GDP and its Revisions](#)

CFM-DP2018-24

Nikoleta Anesti¹, Ana Beatriz Galvao² and Silvia Miranda-Agrippino^{1,3}

¹Bank of England, ²University of Warwick, ³Centre for Macroeconomics

Assessing a country's growth in real time can be thought of as a dual problem. The first difficulty lies in the fact that GDP figures are typically quarterly, and released by the statistical offices with delay. A second complication arises from the fact that these initial official estimates rely on incomplete information, and undergo multiple revision rounds as time goes by and more data are incorporated in the calculations.

The first issue has been successfully addressed in the empirical literature, by devising now-casting models that are able to exploit the co-movement between GDP and more timely indicators (see Evans, 2005; Giannone, Reichlin and Small, 2008, for earlier treatments). Dealing with data revisions is instead more complex, because it requires researchers to make assumptions on whether (e.g. Jacobs and van Norden, 2011) and/or when (e.g. Kishor and Koenig, 2012) 'true' values of GDP growth are observed.

In this paper, we propose a Release-Augmented Dynamic Factor Model (or RA-DFM) that bridges these two literatures with a dual aim. First, it provides a flexible way to explicitly incorporate GDP revisions in standard now-casting models without having to resort to strong assumptions on their modelling, relaxing the framework devised in Camacho and Perez-Quiros (2010). Second, it allows to quantify how the data flow contributes to update the model's forecasts of the revisions themselves, extending the reach of Ban' bura and Modugno (2010).

In the RA-DFM successive release of quarterly GDP growth relative to the same quarter are modelled as separate but correlated observables in an otherwise standard mixed-frequency DFM. This allows us to exploit their intrinsic factor structure, since they are effectively different estimates of the same object. As a result, we can write GDP revisions as being the sum of two components. One that is a function of the common unobserved factors, and hence depends directly on the data flow. This component captures news revisions (Mankiw and Shapiro, 1986), since it is the availability of new information that triggers updates in the estimate of the common factors. Using the RA-DFM, we can forecast these types of revisions, and quantify the role played by the individual data being released. This is the novel feature that is introduced with the RA-DFM. The second component is entirely idiosyncratic, and captures revisions that are due to reduction of measurement errors in earlier GDP releases, that is, noise revisions.

We use the RA-DFM to study early revision rounds of UK GDP growth in real-time. To this end, we assemble a comprehensive mixed-frequency real-time dataset that features over 10 years of real-time data vintages (2006-2016) with history going back to January 1990. The main source for the construction of our real-time dataset are the archives of the Bank of England, in which data released by the UK Office of National Statistics (ONS) have been carefully stored over the years. We make this dataset available to the broader research community.

Our results can be summarised as follows. First, we find that the data flow is informative for the first revision. The data that are mostly informative are, in decreasing order of contribution, business surveys, production data, and labor market statistics. Second, we find that following the first round of revisions, subsequent revisions to GDP official estimates seem to be mainly driven by the removal of measurement issues in previous estimates. Hence, there is less scope for using the data flow to predict them. Third, the RA-DFM produces forecasts for the first two revision rounds whose accuracy is comparable to that of model averages, as embedded in surveys of professional forecasters and market participants. Neither of them, however, improves consistently over a no-change forecast at all horizons.

In addition to data revisions, the RA-DFM can also be used for now-casting GDP growth itself. When forecasting the first releases of UK GDP, we find that the RA-DFM yields statistically significant improvements against a standard mixed-frequency DFM estimated on real-time data. Finally, we evaluate the predictive performance of the RA-DFM for the latest vintage of GDP growth, arguably the best estimates of UK GDP currently available. We find that RA-DFM forecasts contain useful information for forecasting mature GDP vintages that is not included in early ONS estimates. Also, we find that RA-DFM predictive densities for the latest GDP estimates are correctly specified.