

NOWCASTING UK CONSUMPTION AND INVESTMENT WITH MONTHLY OUTPUT COMPONENTS AND REAL-TIME INDICATORS

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In this project:

- We exploit a large set of traditional and alternative economic indicators to nowcast investment and consumption growth.
- All the indicators considered are sampled monthly, and we use a state-of-art mixed-frequency regression model to link quarterly investment and consumption growth to these indicators.
- Among the monthly indicators, we consider components of GDP computed using the output approach, VAT-based activity estimates, ONS real-time indicators, and traditional leading indicators.
- A challenge for the nowcasting models is reducing the gap between the first and revised estimates of consumption and investment growth. We design our forecasting exercise with real-time data on these GDP components.
- Our empirical results indicate that nowcast models do not perform better than the ONS first estimate when the target is investment and consumption growth as recorded in the latest available vintage.
- We show, however, that nowcast models that exploit the information of monthly GVA data and real-time indicators do better than a simple autoregressive model. They are particularly good in nowcasting the bounce-back from the effect of the Covid restrictions during the 2020-2021 period.

Nowcasting Model:

Let y_t be the quarterly GDP component of interest sampled quarterly ($t = 1, 2, \dots, T$, where py is the maximum number of lags). Now assume we have a predictor x_t that is available at a higher frequency, that is, at a frequency m times higher than y , such that, $t = 1/m, 2/m, \dots, 1, 1 + (1/m), 1 + (2/m), \dots, 2, \dots, T$. The Unrestricted Mixed Data Sampling (UMIDAS) regression to use x_t to forecast y_t is:

$$y_t = \alpha_{L,0} + \sum_{i=1}^{py} \alpha_{L,i} y_{t-i} + \sum_{j=0}^{px-1} \beta_{L,j+1} x_{t-\frac{L+j}{m}}^{(m)} + \varepsilon_{t,L} \quad (1)$$

where py is the maximum number of quarterly lags for the target variable y , and px is the maximum number of the predictor's high frequency (monthly) lags. L is the number of high-frequency monthly lead periods. For example, if all data on x_t is available before the publication of y_t , we set $L = 0$.

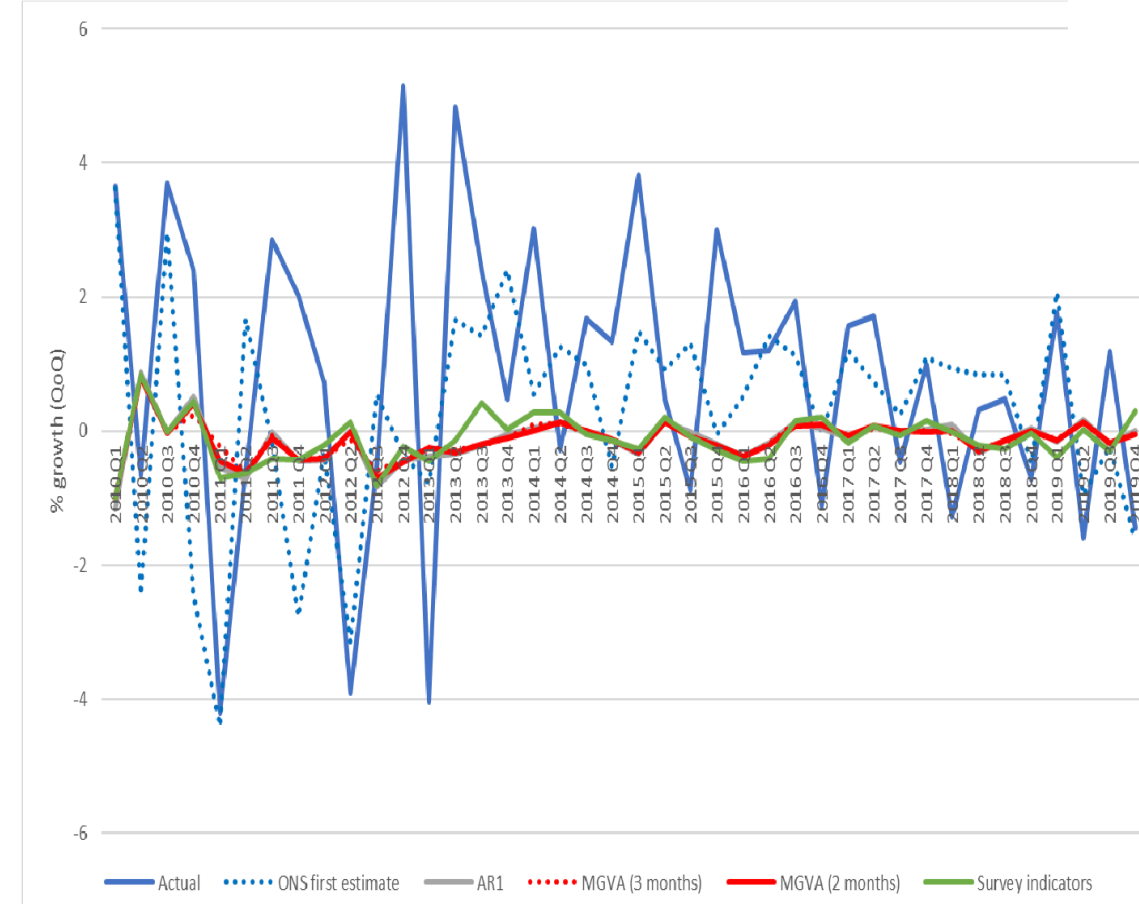
As we consider many lags of the indicator variable x , say $px=12$, we use Bayesian methods to estimate the UMIDAS regression to dampen the effect of parameter uncertainty on nowcasts. We follow the suggestions of Carriero, Clark and Marcellino (2018) and use the normal/inverse gamma conjugate priors' strategy, where we assume the prior mean for betas is zero, leading to a shrinkage-like estimator.

Using only first estimates. RMSFE. UMIDAS-AR

Table 2A: Pre-Covid period (2010Q1-2019Q4)

	2010Q1-2019Q4	
	Consumption	Investment
ONS first estimate	0.69	2.04
AR only	0.81	2.44
Monthly GVA (3mths)	0.81	2.44
Monthly GVA (2mths)	0.81	2.44
Survey indicators	0.80	2.40

Figure 6: Investment Forecasts
Figure 6A: 2010Q1-2019Q4.



Using only first estimates. RMSFE. UMIDAS

	2020Q1-2021Q4	
	Consumption	Investment
ONS first estimate	1.45	2.86
AR only	35.65	11.30
Vacancies	8.17	6.05
Card spending	8.46	7.80
Monthly GVA (3mths)	8.13	6.31
Monthly GVA (2mths)	7.56	5.94
Survey indicators	8.60	8.40
VAT	9.79	7.98

Figure 6B: 2020Q1-2021Q4

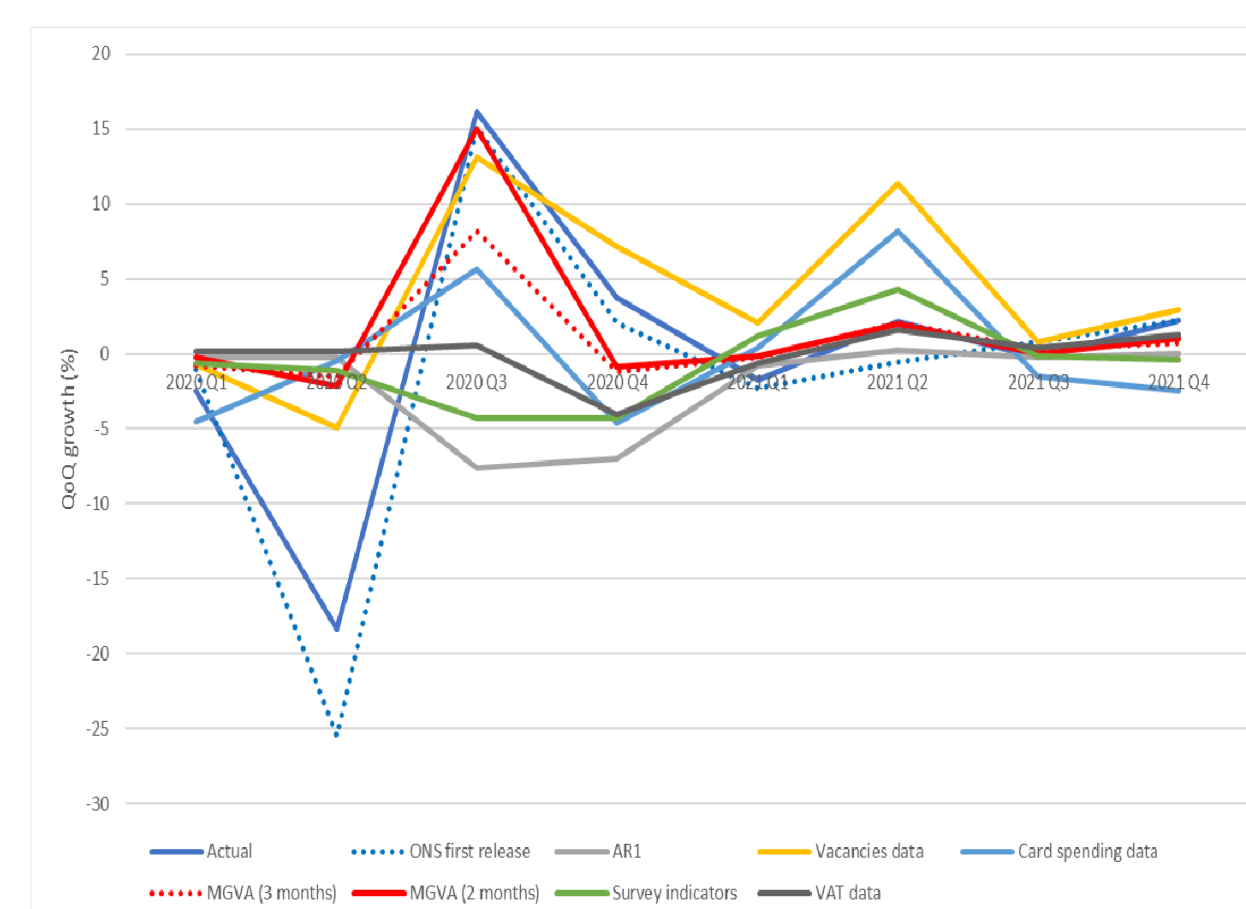
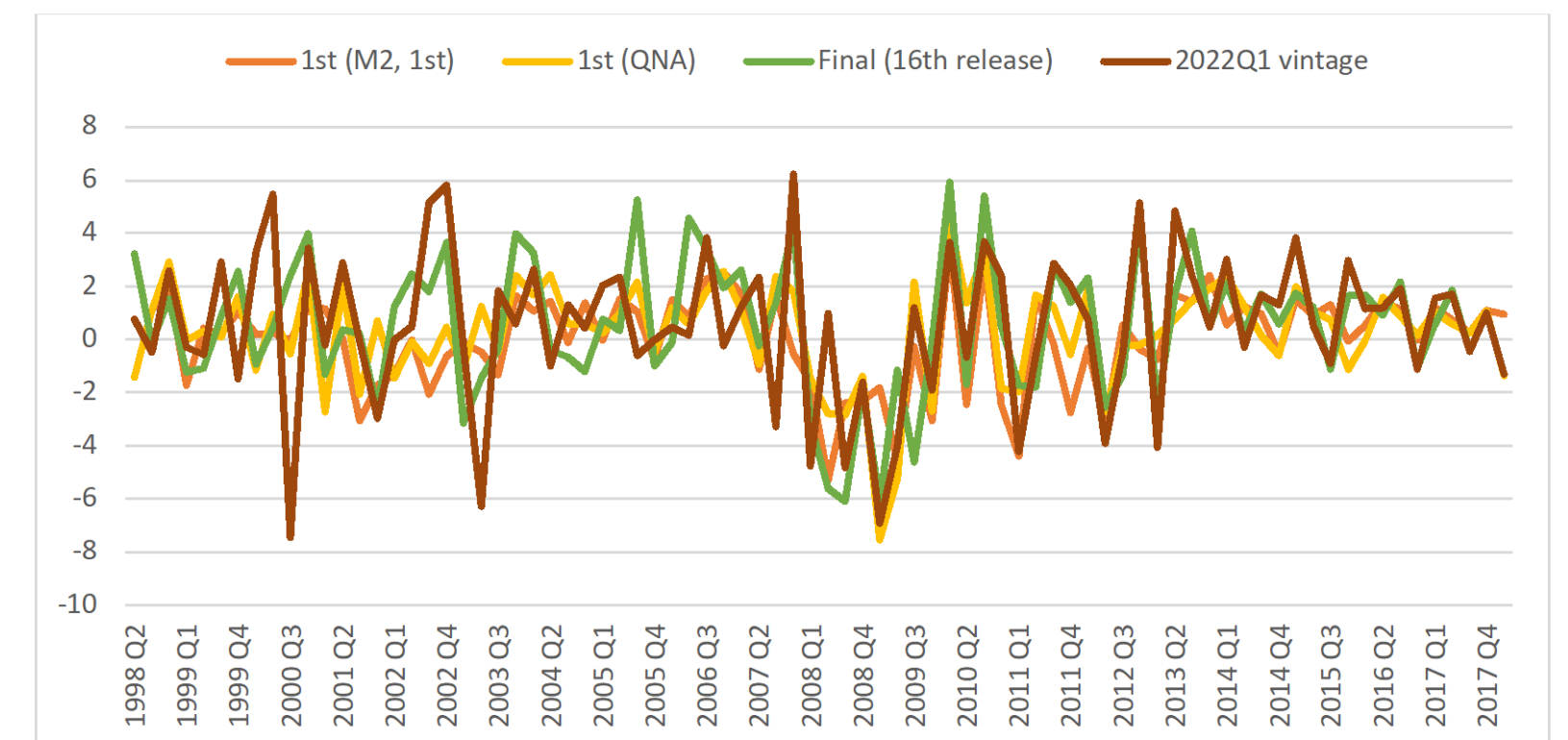


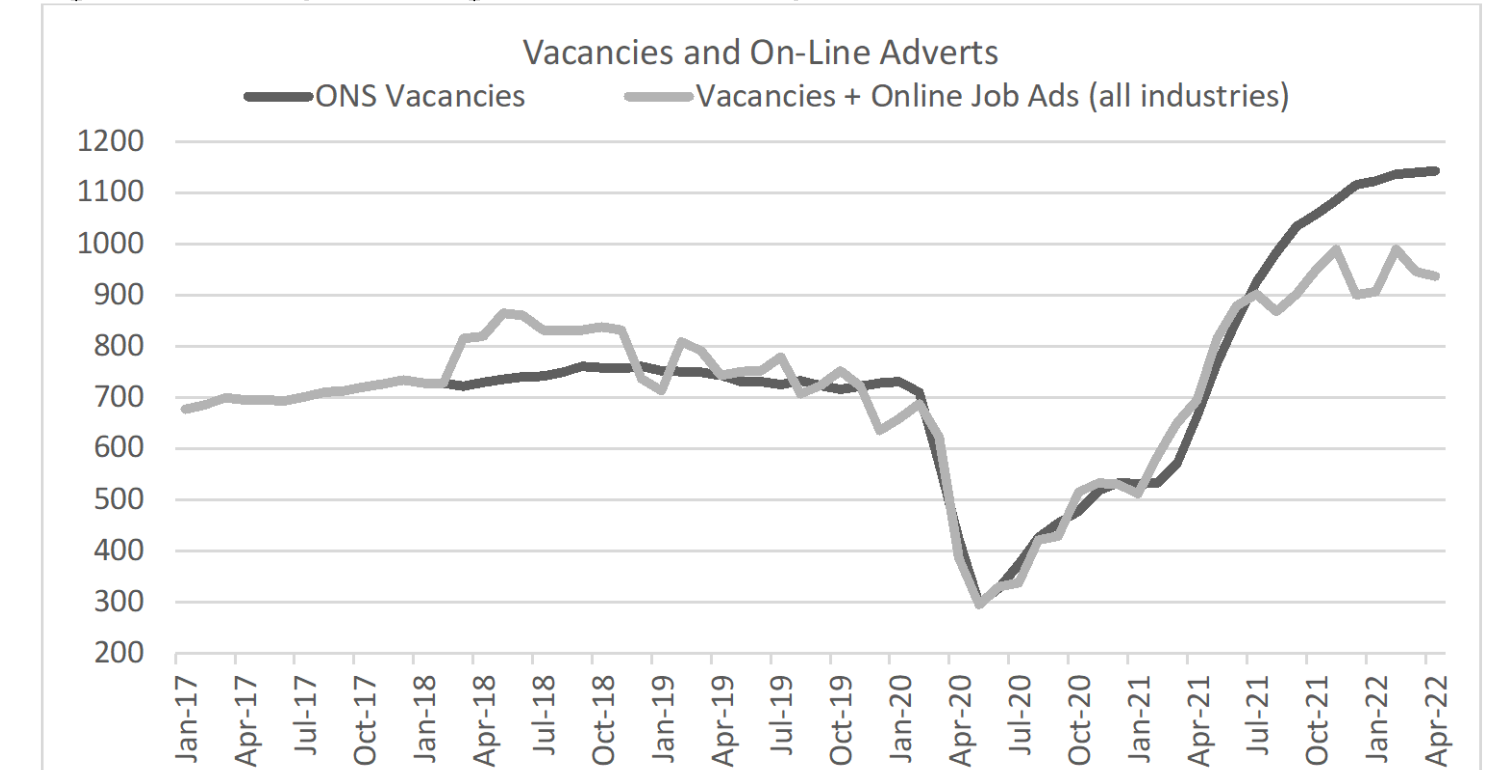
Figure 1: UK Aggregate Investment (Gross Fixed Capital Formation) Growth Estimates



Using Real-Time Weekly Indicators with 2-4 years of historical data:

- We match a weekly real-time indicator with an ONS monthly indicator. The traditional interpolation approach is extended by using a mixed-frequency regression to link the monthly predictor x_t with the weekly real-time indicator z_t .

Figure 2: Monthly Series augmented with Weekly Real-Time Indicators.



Design of the Nowcasting Exercise:

- Two out-of-sample periods: 2010Q1-2019Q4 and 2020Q1-2021Q4
- Equal-weight forecast combination of a single variable MIDAS model within a class of indicators.

- Monthly components of GDP output approach:** (i) Mining, (ii) Agriculture, (iii) Manufacturing, (iv) Electricity, (v) Water, (vi) Construction, (vii) Retail, (viii) Transport, (ix) Hospitality, (x) Communication, (xi) Finance, (xii) Property, (xiii) Professional, (xiv) Administrative, (xv) Public, (xvi) Education, (xvii) Health, (xviii) Arts, (xvix) Other Services, (xx) Household. 3-month growth rates.
- Traditional monthly survey indicators:** ONS Retail Sales (Great Britain) and GfK's Consumer Confidence indicator for consumption; CBI Retail Orders, OECD Business Confidence indicator and OECD consumer confidence indicator for investment. 3-month growth rates.
- VAT monthly diffusion indices:** these include turnover, expenditure and new reporter indices for each industry sector included in (1), plus aggregated production and services: in total, 107 indices. Sum over a quarter, flash (early), and revised estimates
- Real-time indicators:** weekly online adverts and card spending matched with a monthly ONS time series (vacancies and nominal retail sales).

Figure 3: Forecasting Investment Growth: Box plot of RMSFEs for individual monthly sectoral GVA models

Figure 3A: Pre-Covid period

