Methodology Nowcast

Nowcasting models are used to estimate GDP growth based on indicators that have been published recently and that historically have shown to be highly correlated with the growth of GDP. They are a useful instrument to monitor cyclical developments on a high frequency basis before the publication of quarterly national accounts.

Our own modelling work covers the eurozone and France. All our models are calibrated (Q1 2000 – Q4 2016) and tested (Q1 2017 – Q4 2022) over the same periods. We have worked on two model families: one with non-reduced dimensions and the other with reduced dimensions (factor-augmented mixed-frequency approach). The resulting forecast corresponds to the average forecast of the two approaches.

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Models without reduced dimensions

Within this family of models, data are selected by a 'stepwise' regression. This family consists of five distinct models:

1) OLS model containing 12 variables: non-sparse linear regression;

2) OLS model containing 7 variables: sparse linear regression;

3) lasso model containing 10 variables: linear regression with a linear constraint on the regression coefficients in order to avoid the overweighting of certain regressors in relation to others;

4) ridge model containing 10 variables: linear regression with a quadratic constraint on the regression coefficients in order to avoid the overweighting of certain regressors compared to others;

5) random forest model containing all variables.

The GDP nowcast from these different models is then aggregated using weights based on the forecast accuracy (the inverse of root mean squared forecast error, RMSFE) calculated on the test sample.

An iterative selection process that sees to it that adding a new variable does not delete a variable that had already been selected. The regressors most closely correlated to the variable of interest (here GDP) are selected. The process of adding additional regressors stops when variable n+1 no longer provides sufficient additional information.

Reduced dimension models

For the second family of models (factor-augmented mixed-frequency approach), activity and survey data are enriched with financial and international data. These data are selected, as in the first model family, by a stepwise regression that retains the regressors with the greatest predictive power. The selection of the chosen variables is then reduced through a principal component analysis (PCA). This statistical technique makes it possible to estimate, by linear combination of the initial variables, a monthly factor which represents the common dynamic. We then we use this monthly common factor to explain quarterly growth using mixed-frequency linear regression (MIDAS).

1 An iterative selection process checking that adding a new variable does not delete a variable that has already been selected. The regressors most closely correlated to the variable of interest (here GDP) are selected. The process of adding additional regressors stops when variable n+1 no longer provides sufficient additional information.
2 The MIDAS model makes it possible to estimate a low-frequency variable (quarterly in our case) with high-frequency variables (monthly).

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A forecast at different times of the quarter

A nowcasting model offers a forecast of GDP growth at different points in the quarter. There are four in a quarter: month 0, month 1, month 2, month 3. These moments are dictated by the timing of publication of indicators. When doing an estimate in month 0, no hard data for the estimated quarter have been published yet, but certain surveys for the first month of the current quarter are available. Similarly, an estimate made in month 1 means that we have the first month of hard data and the first two months of surveys, and so on. The time when the forecast is made is critical: the quality of the forecast improves significantly as hard data are published and added. An estimate made, for example, in month 1 therefore is less reliable than the estimate made in month 3: the forecast error decreases as we move forward in the quarter.

Indicators for France

INDICATOR	SOURCE
Industrial confidence indicator	European Commission
Retail trade confidence indicator	European Commission
Services confidence indicator	European Commission
Construction confidence indicator	European Commission
Household confidence	European Commission
Manufacturing business climate	INSEE (French National Institute of Statistics and Economic Studies)
Composite business climate indicator	INSEE (French National Institute of Statistics and Economic Studies)
Retail trade business climate	INSEE (French National Institute of Statistics and Economic Studies)
Services business climate	INSEE (French National Institute of Statistics and Economic Studies)
Building construction business climate	INSEE (French National Institute of Statistics and Economic Studies)
Household confidence	INSEE (French National Institute of Statistics and Economic Studies)
Services survey – Past activity – Accommodation & Catering	INSEE (French National Institute of Statistics and Economic Studies)
Services survey – Past activity – Hotels and tourist accommodation	INSEE (French National Institute of Statistics and Economic Studies)
Services survey – General business outlook – Accommodation & Catering	INSEE (French National Institute of Statistics and Economic Studies)
Services survey – General business outlook – Hotels & tourist accommodation	INSEE (French National Institute of Statistics and Economic Studies)
Business climate in industry	Banque de France
Business climate in services	Banque de France
Business climate in construction	Banque de France
Composite PMI	S&P Global (Markit)
Construction PMI	S&P Global (Markit)
Services PMI	S&P Global (Markit)
Manufacturing PMI	S&P Global (Markit)
Composite employment PMI	S&P Global (Markit)
Retail trade sales	Eurostat
Household consumption in goods	INSEE (French National Institute of Statistics and Economic Studies)
Producer price index	Eurostat
Industrial production	Eurostat
Construction producer price index	Eurostat
Industrial producer price index	Eurostat
Number of homes built	INSEE (French National Institute of Statistics and Economic Studies)
Unemployment rate	Eurostat
Temporary employment	INSEE (French National Institute of Statistics and Economic Studies)
HICP	Eurostat
Number of car registrations	Eurostat
Production capacity utilization rate	Eurostat

Indicators for the eurozone

INDICATOR	SOURCE
Economic sentiment index	European Commission
Industrial confidence indicator	European Commission
Services confidence indicator	European Commission
Retail trade confidence indicator	European Commission
Construction confidence indicator	European Commission
Household confidence	European Commission
Credit Suisse Barometer (current situation)	Credit Suisse
Credit Suisse Barometer (expectations)	Credit Suisse
Sentix index (current situation)	Sentix
Sentix Index (expectations)	Sentix
ZEW survey (current situation)	IFO
ZEW survey (expectations)	IFO
Composite PMI	S&P Global (Markit)
Construction PMI	S&P Global (Markit)
Services PMI	S&P Global (Markit)
Manufacturing PMI	S&P Global (Markit)
Retail trade sales	Eurostat
Wholesale trade sales	Eurostat
Industrial production	Eurostat
HICP	Eurostat
Industrial producer price index	Eurostat
Real effective exchange rate	Eurostat
Unemployment rate	Eurostat
Number of car registrations	Eurostat
Production capacity utilization rate	Eurostat

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