BCS workshop

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Views are my own.

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Introduction

- We estimate GDP in real-time using a (data-driven) econometric model;
- We evaluate the predictive ability of BCS surveys in accurately estimating GDP;
- We show:

  1. How the model reduces uncertainty around the estimates when more information is available;
  2. BCS out-perform PMI in an historical test window;
  3. Our model estimates the impact of new releases on the nowcast revision;

GDP nowcasting and surveys

- GDP is released at quarterly frequency with considerable delay (1 month);
- Timely estimation of GDP leads to two important challenges:
    - Variable selection: Selecting hard/soft variables that can track the GDP in real-time;
    - Econometric problem: incorporating frequently available information in a model to estimate GDP in real-time;
- Many scholars and academics published methodologies to address both problems.

GDP nowcasting and surveys

- Variable-side:
  - We use soft/hard data;
  - **Hard data**: selected according to apriori coherence with GDP;
  - **Soft data**: BCS survey;
- Modelling-side:
  - We use mixed-frequency BVAR;
  - We both account for different and irregular frequency of the variable releases.

Variables selected

Indicator Name	Transformation	Release date	Month considered
GDP	log-levels	End of next month	
BCS surveys	levels	end of current month	within current month
Industrial production (all)	log-levels	1.5 half months delay	within second next month
Retail sales (volumes)	log-levels	1 month delay	within next month
Construction index	log-levels	1.5 half months delay	within second next month
Total exports	log-levels	1.5 half months delay	within second next month
Total imports	log-levels	1.5 half months delay	within second next month
Unemployment rate	levels	1.5 half months delay	within second next month
HICP	levels	1 month delay	within next month
Euribor 3M	levels	current month	within current month
Brent oil	levels	current month	within current month
STOXX600	levels	current month	within current month

Table 4.2: Variables used (hard and soft indicators), transformation and their release dates.

- BCS surveys are released each month;
- The frequently availability of surveys is important to timely estimate GDP.

The nowcasting setup

$$
\begin{bmatrix}
\times & BCS_{M7} & IP_{M7} & \cdots & HICP_{M7} \\
\times & BCS_{M8} & \times & \cdots & HICP_{M8} \\
\times & BCS_{M9} & \times & \cdots & \times \\
\mathrm{gdp}_{Q3} & \times & \times & \cdots & \times
\end{bmatrix}
$$

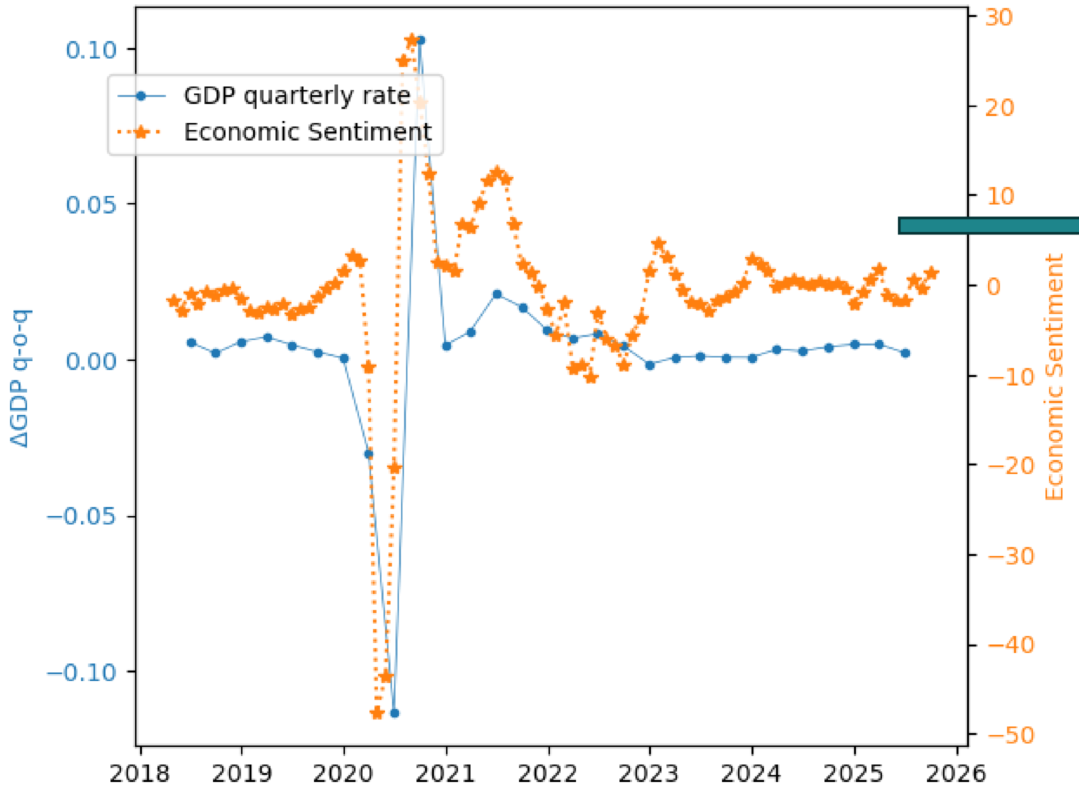
- *Official GDP is released 1 month after the end of the quarter.*

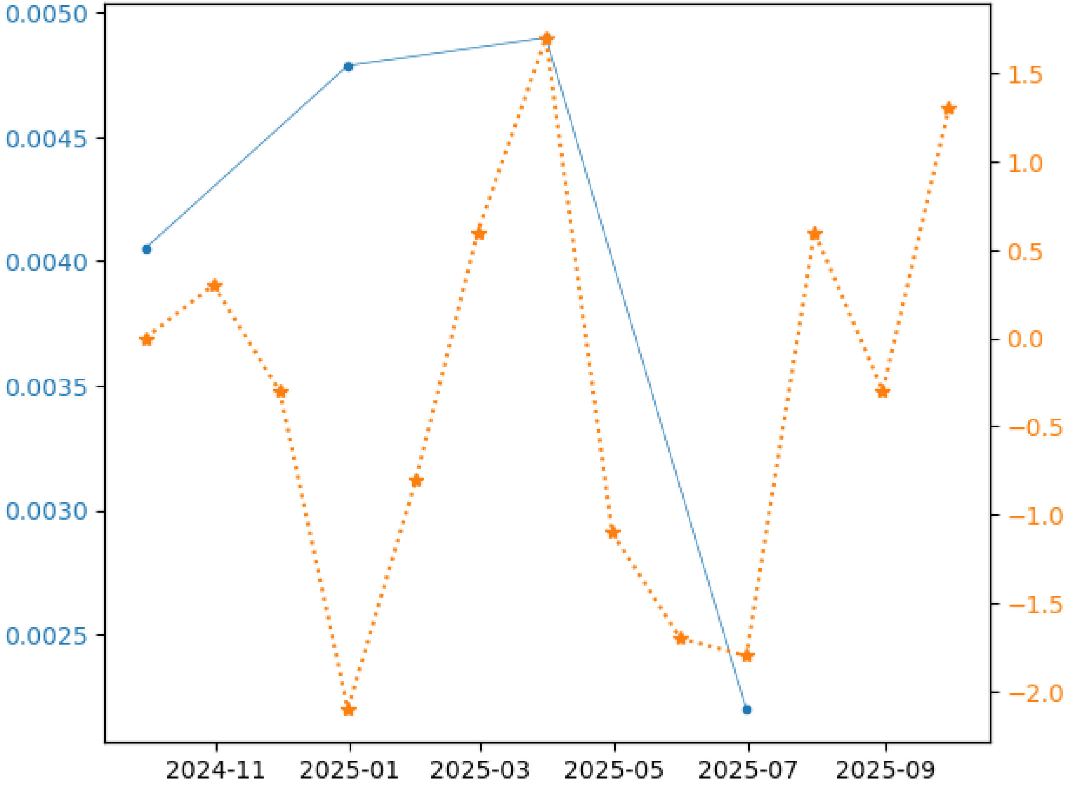
- Data are irregular;
- The mixed-frequency BVAR accounts for this;
- Each new data release revises the estimate of the GDP;

- **Nowcasting**: using all available information (from future and past) to estimate the actual release;

Variables correlation

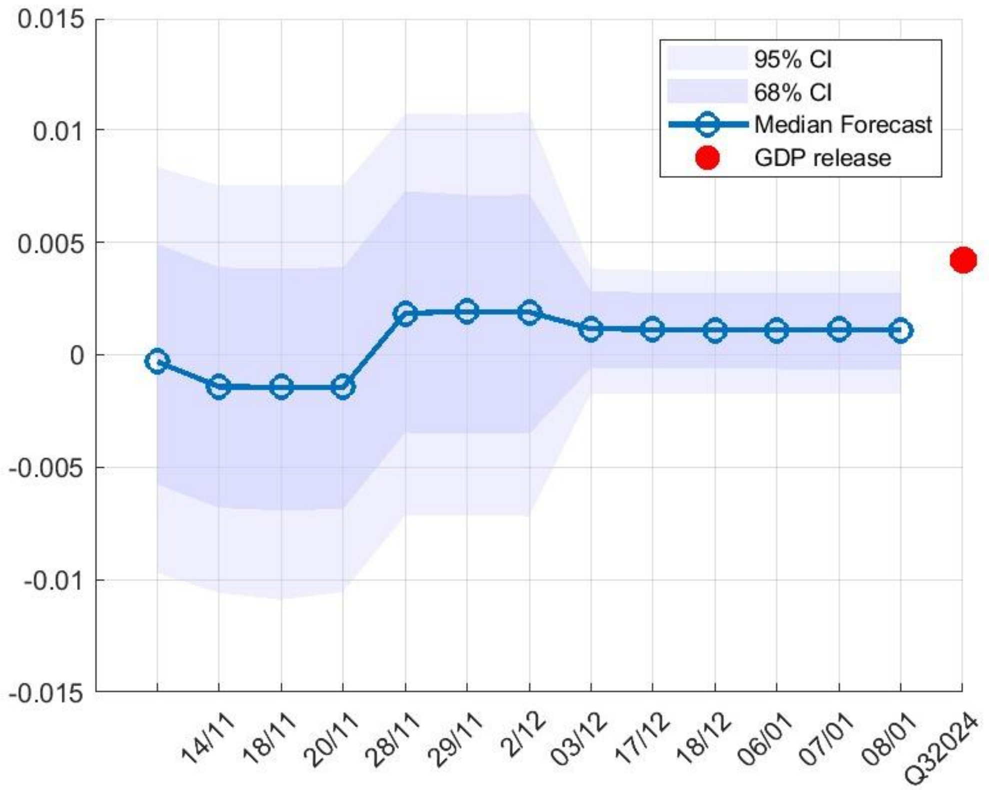
Information on most recent months can be used to predict the GDP.

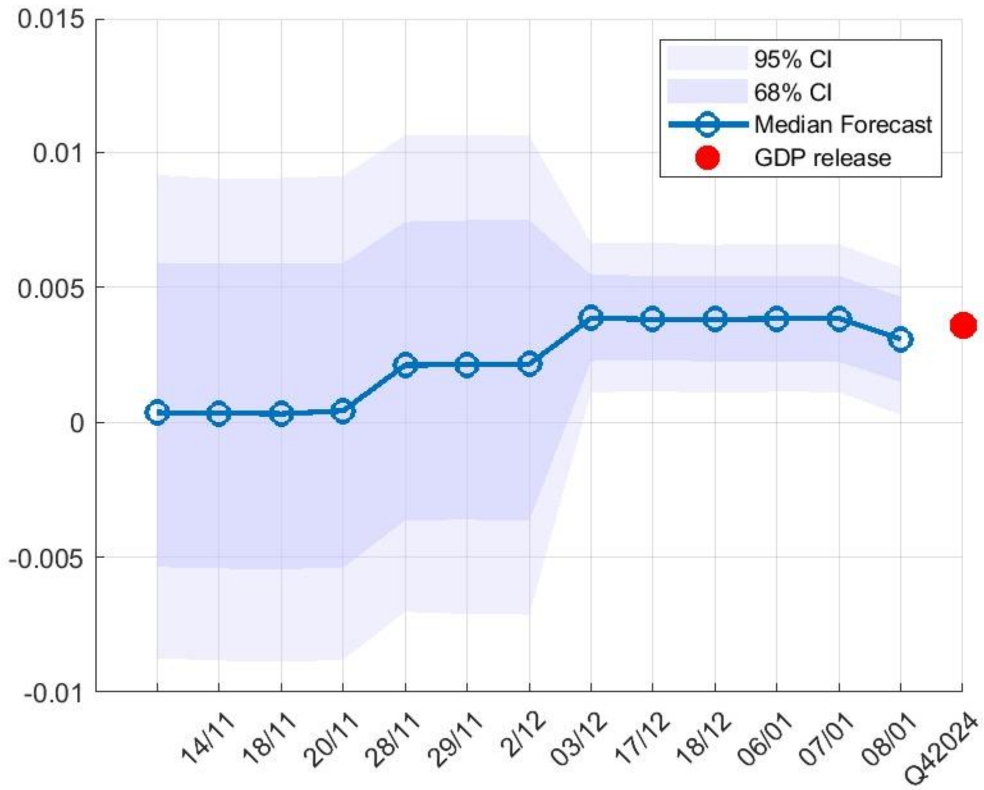




Additional info available.

Uncertainty reduction





Outline of the analysis

1. We evaluate the model’s performance in the test period (2018Q2-2025Q3) in terms of directional accuracy and Mean squared error (MSE);

2. The test phase allows us to select the best model;

3. We regularly update the model’s parameters in terms of historical performance.

Summary of the results

1. BCS are better than PMI when compared in the test set, both in terms of directional accuracy and MSE.

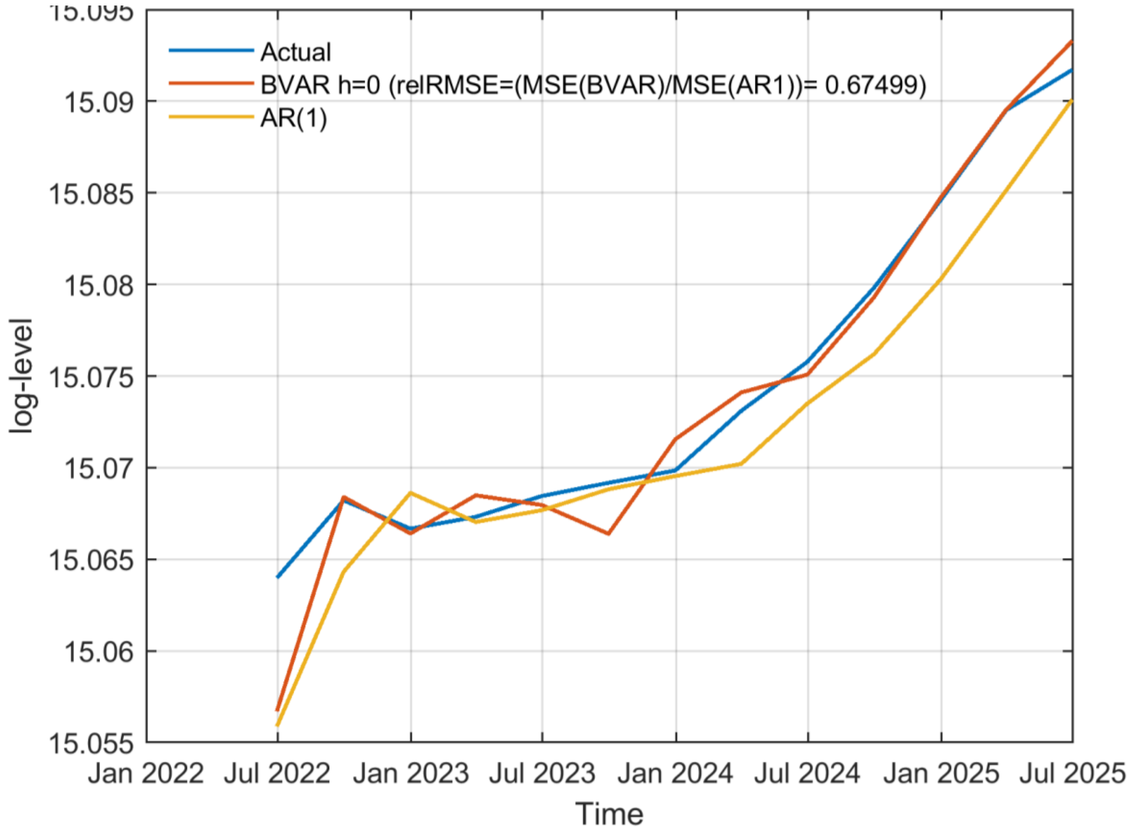
2. On average, the BVAR models yield more accurate estimates of the AR(1) (benchmark model). Moreover, the forecasts are significantly different during Covid period;

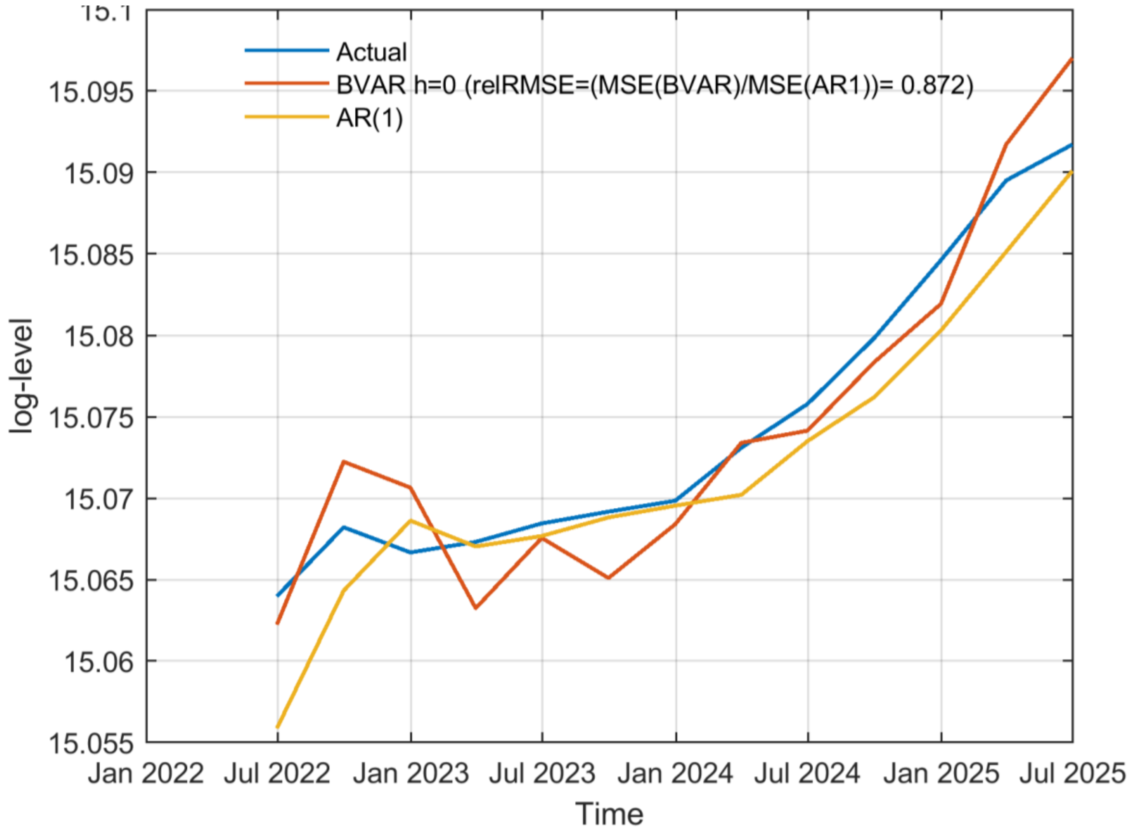
3. The main advantage of using BVAR model is its state-space representation which allows the model to handle asynchronous data releases.

    - The state-space representation (Kalman filter step) enables the computation of the marginal contributions of different variable releases;

    - The uncertainty around the estimate is reduced when more variables are released.

Historical performance





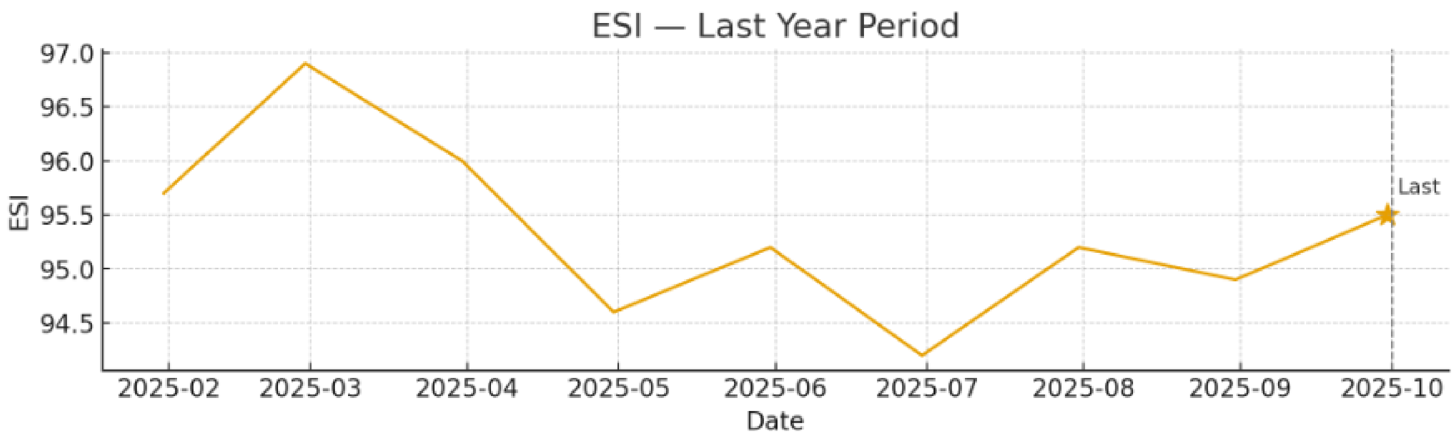
The model’s expectations

- With the BVAR we can evaluate the impact of each new data release to the GDP estimation;
- The model estimates an expectation of each variable;

$$\begin{bmatrix} \times & BCS_{M7} & IP_{M7} & \cdots & HICP_{M7} \\ \times & BCS_{M8} & \bullet & \cdots & HICP_{M8} \\ \times & BCS_{M9} & \bullet & \cdots & \bullet \\ \mathrm{gdp}_{Q3} & \times & \times & \cdots & \times \end{bmatrix}$$

- When the official data is released, when can interpret the change in the nowcast as ‘**news effect**’.

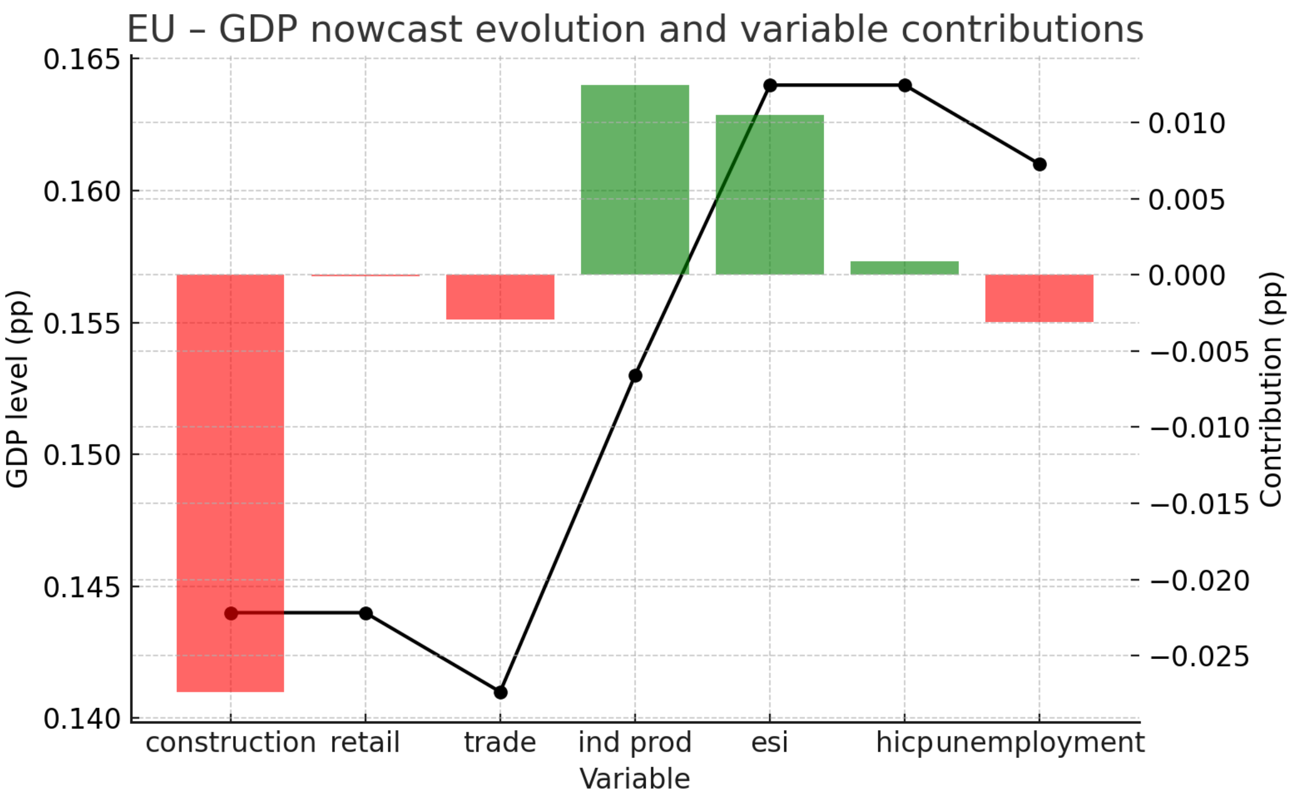
ESI time series



- ESI registered an increase in the last period;

- The contribution depends on the model's expectations of ESI before it was released.

Variables contributions



- Construction index was below the model's expectations and produced a negative revision;

- Industrial production and ESI had a positive impact on the nowcast.

Conclusions

- We combine survey data with standard macroeconomic indicators in a BVAR model;
- We assessed the superior predictive performance of the BCS surveys over PMI, confirming previous results from the literature;
- Our pipeline:
  - Assess the best model’s parameterization with historical data;
  - Computes the final nowcast along with ‘news-based’ contributions;
- It is important to constantly monitor the performance of the model.

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Thank you

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