

Discussion: Sparse Warcasting by Mihnea Constantinescu

Annukka Ristiniemi (ECB)

22 June 2023

The views expressed herein do not necessarily reflect those of the European Central Bank or the Eurosystem

Summary of the model

- Nowcasting GDP in Ukraine during the war
- No usual hard/soft data available especially in the beginning of the war.
- For security reasons, novel data used during Covid was also suspended
- Hence, rely only on subset of 'big data', Google search metrics as the single source of information

Warcasting strategy

Partial least squares

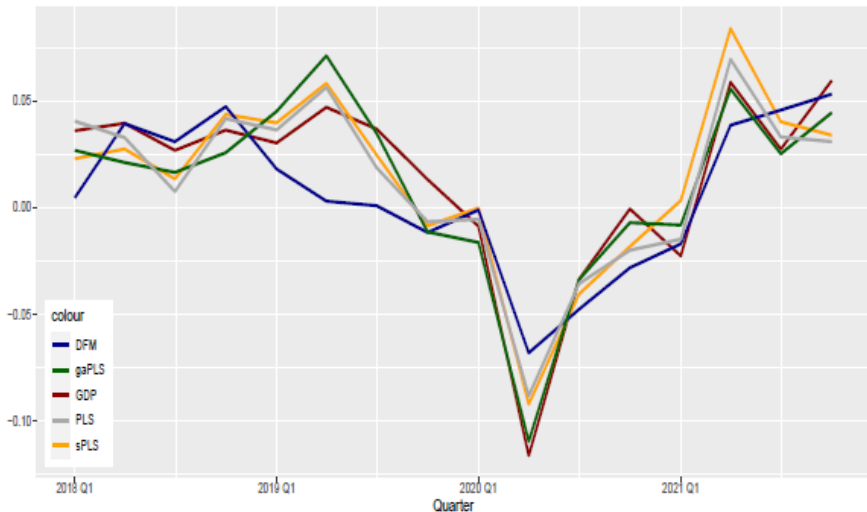
$$\begin{aligned} \max_{\omega} \quad & \text{Corr}^2(y, X \times \omega) \text{Var}(X \times \omega) \\ \text{s.t.} \quad & \omega' \times \omega = 1, \quad \omega' \times \sum_X \times \omega_j, \\ & \forall j = 1, \dots, M - 1 \end{aligned}$$

Principal components

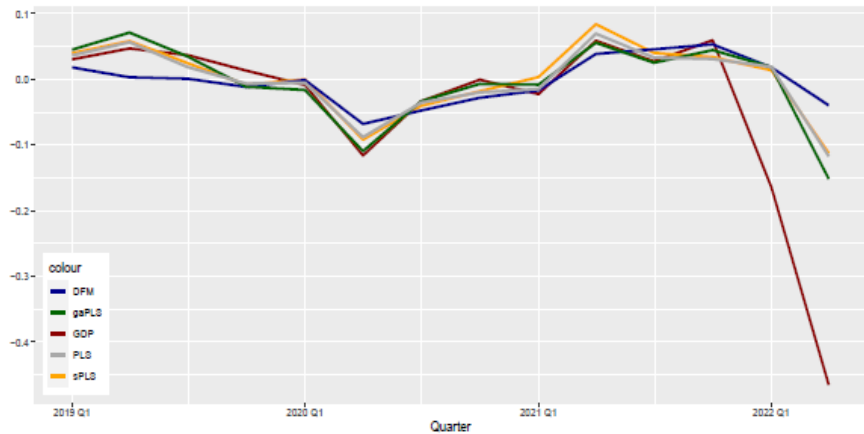
$$\begin{aligned} \max_{\omega} \quad & \text{Var}(X \times \omega) \\ \text{s.t.} \quad & \omega' \times \omega = 1, \quad \omega' \times \sum_X \times \omega_j, \\ & \forall j = 1, \dots, M - 1 \end{aligned}$$

- PLS is supervised, the algorithm cares about the prediction of the target variable, in contrast to PC
- With a small sample overfitting is an issue - pre-selection of Google trends is needed (Sparse PLS, genetic algorithm...)
- Model trained on 2013-2021 data, nowcast on Q1 and Q2 of 2022

In-sample forecasting performance



Out-of-sample forecasting performance



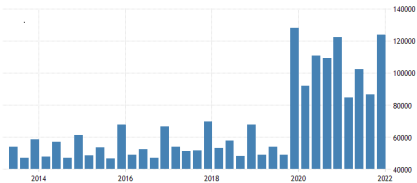
Comments

- Convincing arguments about superior predictive power of the PLS algorithm, however:
- Best algorithm predicts only a third of the output loss.
- Google trends usually have good predictive power only in absence of other data, and more evidence of predicting consumption
 - ▶ Government spending doubled
 - ▶ Military expenditure increased 10 fold
 - ▶ Manufacturing production declined 40%
 - ▶ Consumption stayed relatively stable
- Also for consumption, the relevant keywords might have changed (e.g. travel, holiday, MBA degree, inflation, fitness..)

Data

Ukraine Government Spending

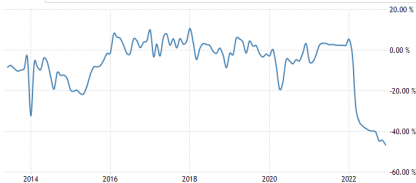
Summary Forecast Stats Download ▾



TRADINGECONOMICS.COM | STATE STATISTICS SERVICE OF UKRAINE

Ukraine Manufacturing Production

Summary Stats Download ▾

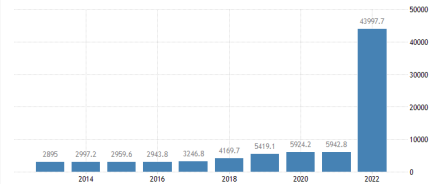


TRADINGECONOMICS.COM | STATE STATISTICS SERVICE OF UKRAINE

Ukraine Military Expenditure

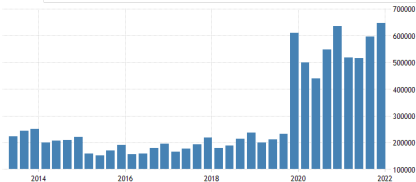
Summary Stats Download ▾

10Y 25Y 50Y MAX Chart Compare Export API Embed



Ukraine Consumer Spending

Summary Forecast Stats Download ▾



TRADINGECONOMICS.COM | STATE STATISTICS SERVICE OF UKRAINE

Comments

- Adding other variables might be useful. Cash data in the last section for example
- The genetic algorithm for pre-selection seems to work particularly well in crisis times. Why?
- Is the estimation done on real-time data?
- Details about the sampling are missing. How many repeated collections of samples, what variables are selected for specific regions? How do you arrive at the first list of trends and how many trends do you consider?