Nowcasting Bosnia and Herzegovina GDP in Real Time

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*The views expressed herein are of the author and do not necessarily represent those of the CBBH

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Introduction

➢ Nowcasting of macroeconomic variables is developed with the support of the Institute of Geneva's Bilateral Assistance and Cooperation with the Central Banks (BCC) program.

➢ The purpose of the paper is to improve nowcasting of GDP and accuracy performance.

➢ The COVID-19 pandemic and the war in Ukraine caused an enormous uncertainty shock.

➢ The nowcasting models have more profound role, comparing to the more structural projection models that are used for longer-term horizon.

➢ The choice of the variables is the core of nowcasting.

➢ The high variance of the specific nowcasting model influence the use of combination the results of many models.

➢ Including additional combination methods improve the existing nowcasting model.

First realase of GDP and main aggregates, Q4 2020

COUNTRY	DATE
BA	31/3/2021
AL	31/3/2021
BG	9/3/2021
CZ	2/2/2021
GR	5/3/2021
HR	15/2/2021
HU	16/2/2021
ME	17/3/2021
RS	1/3/2021
SI	26/2/2021
EU	2/2/2021

Variable selection

The present nowcasting model

ARMA model	Generally used as a benchmark forecast model
Bridge model	Regressions relating quarterly GDP growth to one monthly variables aggregated to quarterly frequency
Principle component	Most nowcasting models are based on some kind of factor analysis - the extraction of several factors from a large set of indicators
Dynamic factor model	The problems of mixed frequency and ragged edge are basically missing data problems, which are easily solved by Kalman filter
MIDAS/UMIDAS models	Tightly parametrized reduced form regressions with variables sampled at different frequencies.
FAVAR	Multivariate models are also suitable tool for estimating and forecasting

Nowcasting in pandemic

Literature

➢ Huber et al. (2020) shows that with the arrival of the COVID-19 pandemic the need for MFVAR nowcasts has become even more acute.

➢ Schorfheide and Song (2020) also estimate MFVAR to generate real-time macroeconomic forecasts for the U.S. during the COVID-19 pandemic.

➢ Silverstovs (2021) present the results of forecasting the euro area GDP growth rate, paying special attention to the models forecasting performance during the COVID-19 pandemic. Using the data for the pre-pandemic period, it shows that ignoring asymmetries in a models forecasting performance across the business cycle preformance typically leads to a biased judgment.

➢ Ankargren and Lindholm (2021) nowcast Swedish GDP using short term forecasting models. Their results reveal a clear divide between, the pre-pandemic period and usefulness during the pandemic. In a comparison with a model that it is not re-estimated during the pandemic the re-estimated models nowcast are more accurate.

Evaluation of present nowcasting models

➢ The root mean square error (RMSE) is used to assess the model forecast accuracy. According to RMSE statistics suitable models are selected.

$$RMSE = \sqrt{\frac{1}{T} \sum_{t=1}^{T} e^2{}_{t+h,t}}$$

➢ The simple equal weight (EW) averaging tend to work well in practice and can potentially cover the important variations of individual models

$$y_{t+h,t}^{EW} = \frac{1}{m} \sum_{i=1}^{m} y_{t+h,t}^{M_i}$$

➢ Setting weights according to the past forecast performance (MSE):

$$\omega_i^{MSE} = \frac{MSE_i^{-1}}{\sum_{i=1}^{m} MSE_i^{-1}}$$

Improving the nowcasting model

➢ The individual performance of the model is based on models RMSE.

➢ Putting greater weights to the performance before the pandemic crisis improves significantly current nowcasts.

➢ Highly volatility in the retail trade and the service sector indicators influenced mostly the higher RMSE in crisis.

➢ Dynamic factor models that have the lowest RMSE with new evaluation method gained more weight.

➢ Bridge and PC models preformed inferior in the pandemic times.

➢ Improving the existing models explanatory power and forecasting performance.

Weights of each model in diffrent evaulation method
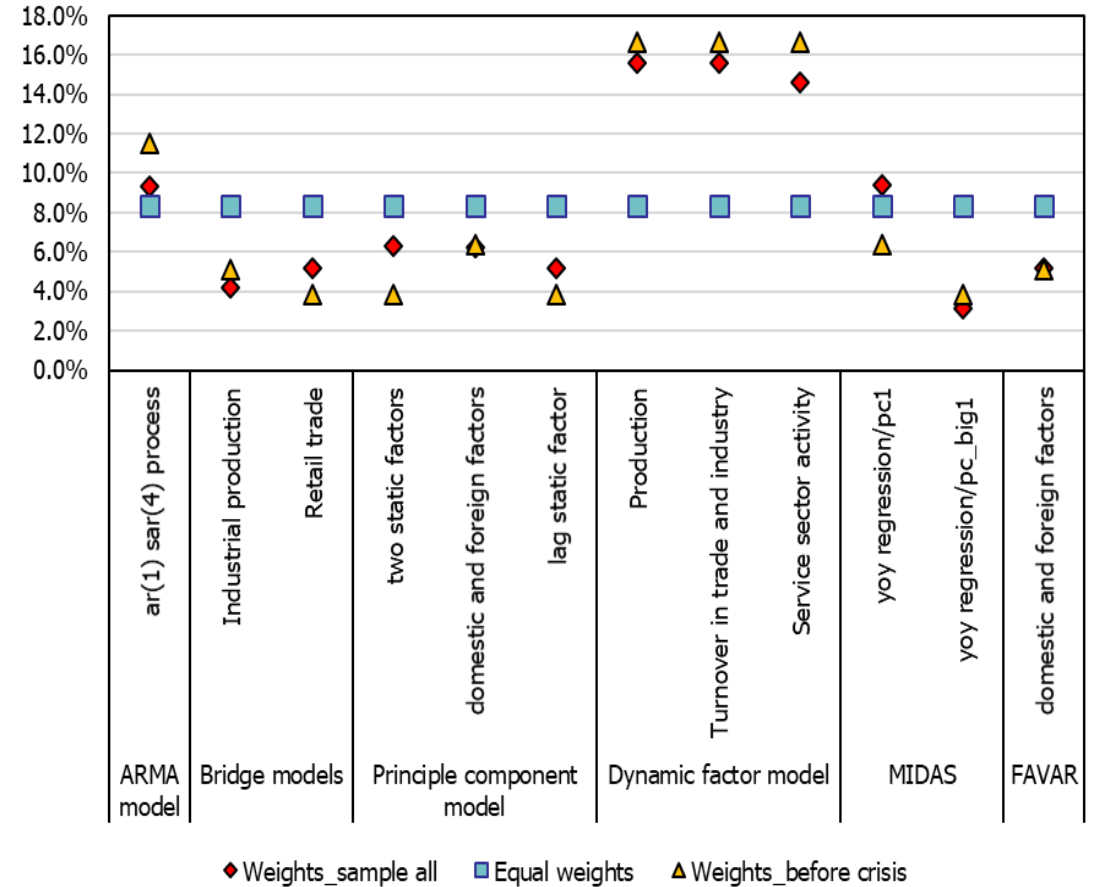
Improving the nowcasting model

➢ The choice of the variables is the core of forecasting.

➢ This guarantee that the resulting factors will be correlated with the target variable and supposedly improve forecasting performance.

➢ From the right graph we can see improvement for each model with the new set of variables which includes some additional endogenous variables such as wage bill etc., and some exogenous variables.

➢ Additionally some variables that are in pandemic highly volatile and are not good explanatory predictor of GDP are excluded such as tourist activity by the most important countries from which tourist are arriving in BH since many countries in pandemic imposed travel restrictions.

RMSE improvment with new varialbes by each model
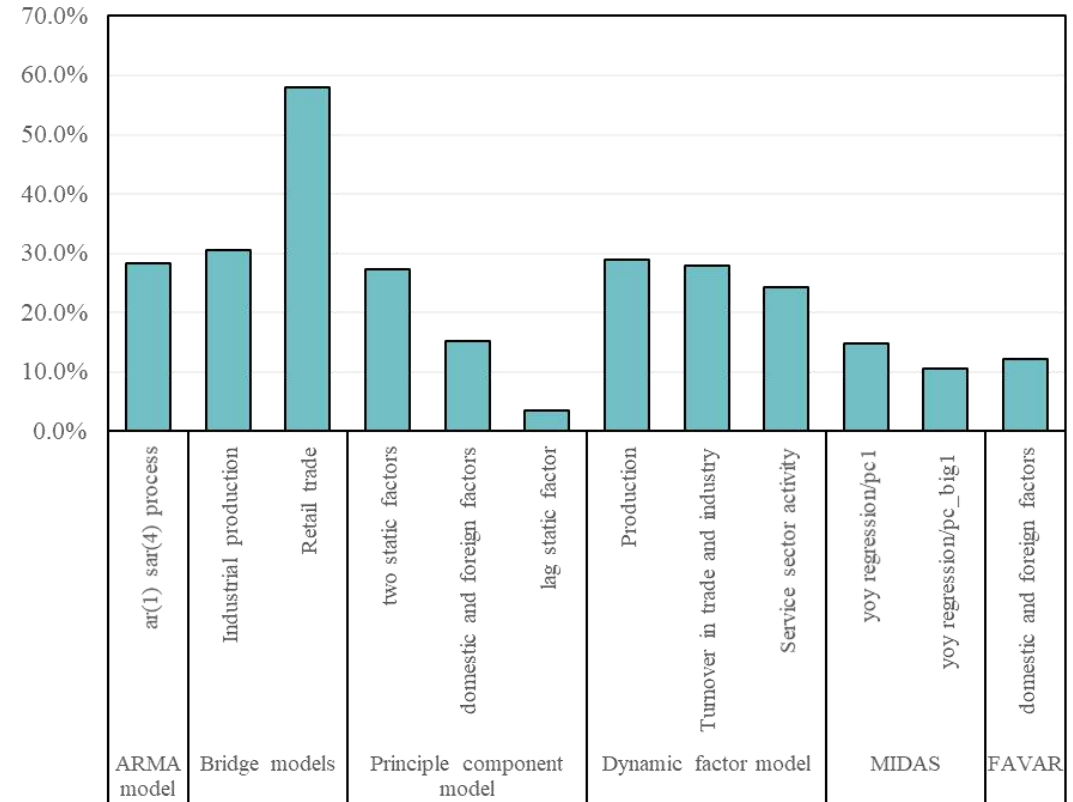
Results and conclusion

➢ The upgraded model based on this research is already enriching the nowcasting of GDP.

➢ Using targeted factors and other combination methods the forecasting error is much lower.

➢ In the future we hope to extend the nowcasting model. Enriching the official statistical reports will help in a more accurate nowcasts.

➢ Most recently the objective is to assess whether Google search data bring some gain in nowcasting accuracy and when. To evaluate the impact of Google search data on current-quarter nowcasts of the GDP growth or short term forecast of inflation.

➢ The update of the nowcasting model is continues work, with integrating additional elements of the economy when data of better quality become available.

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