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Moving from GDP Flash Estimates to GDP Nowcasts

NTTS 2021, Spotlight Session on Nowcasting

Thursday, 11 March 2021

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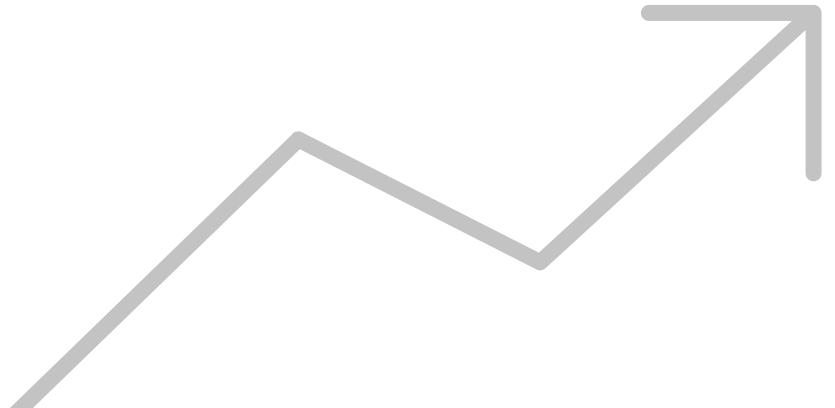
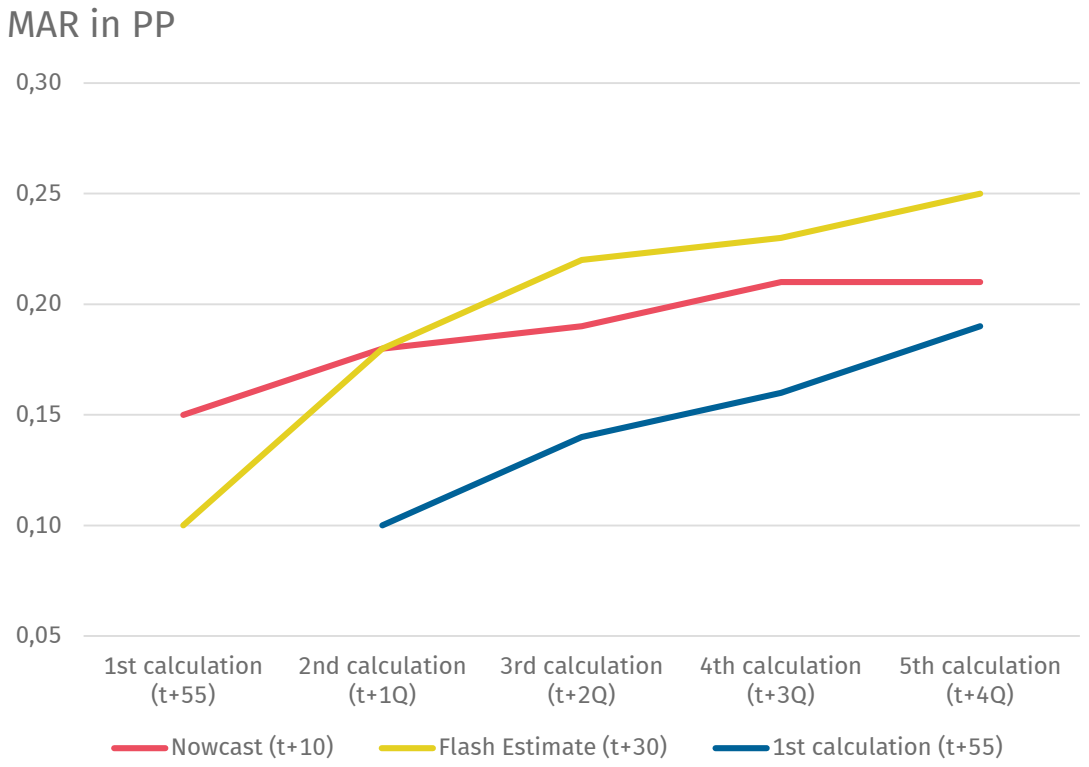


Early GDP estimates in Germany

Nowcasting with ARIMA + early indicators

- Bottom-up on both production an expenditure side in four steps
  - Estimation of missing values of official source statistics
  - Estimation of GDP aggregates
  - Aggregation to production and expenditure side GDP estimate
  - Weighting procedure to get one GDP estimate

Revisions in normal times

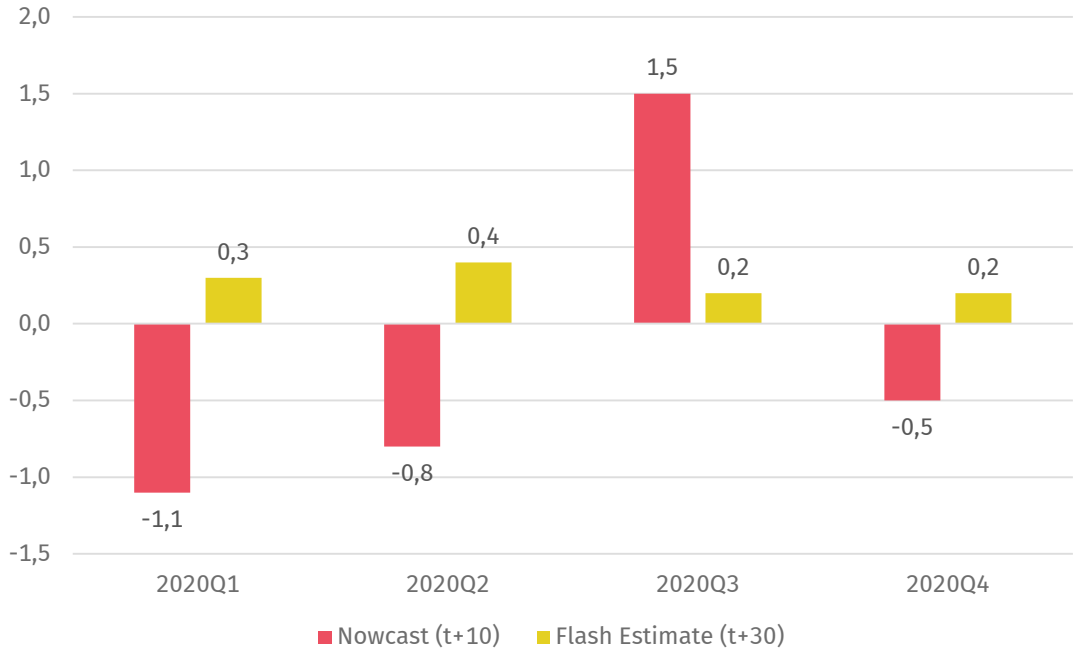


- Nowcast and Flash Estimate unbiased
- Flash Estimate outperforms Nowcast in terms of mean absolute revision (MAR) of 1st calculation
- Nowcast closer to later calculations than Flash Estimate

Reference period from 2016Q1 to 2019Q4. Calculation of revisions based on y-o-y changes of price-adjusted GDP. Results are similar when looking at price, seasonally and calendar-adjusted q-o-q changes.

Revisions in times of a pandemic

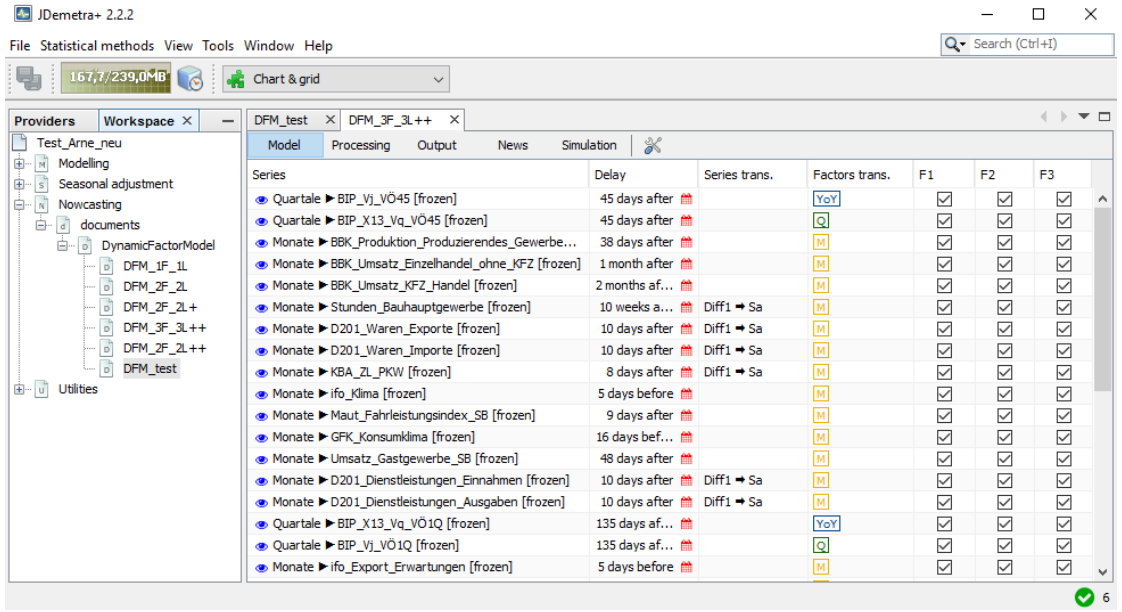
Revision of 1st calculation compared to Nowcast and Flash Estimate in PP



- Downward revisions of Nowcast necessary in Q1 and Q2
- Upward revision of Nowcast necessary in Q3
- Time-series models not able to capture downturn nor rebound accurately
- Autoregressive structure of models pointed in wrong direction during the crisis although early indicators were available
- Flash Estimate slightly too pessimistic in each quarter

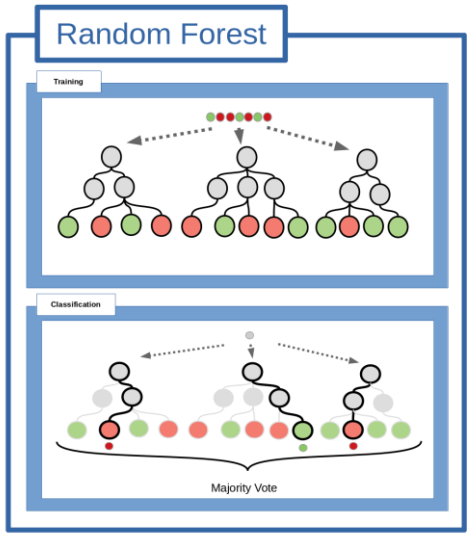
Reference period from 2020Q1 to 2020Q4. Calculation of revisions based on y-o-y changes of price-adjusted GDP. Results are similar when looking at price, seasonally and calendar-adjusted q-o-q changes.

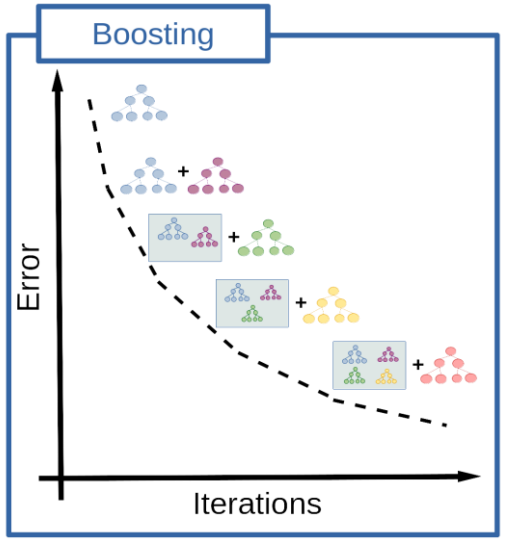
Nowcasting with dynamic factor models (DFM)

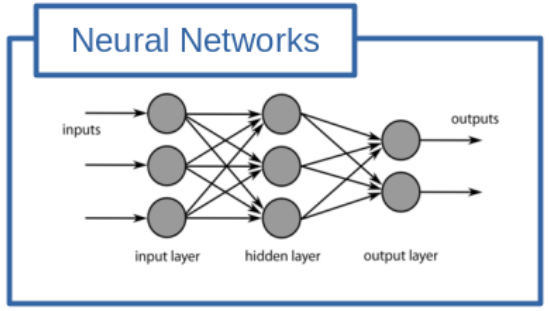


- Top-down
- Different DFM Models
  - Up to 40 monthly and quaterly indicators
  - Up to 4 factors
  - Up to 4 lags
- Simulation with JDemetra+ Nowcasting plugin
  - Pseudo real-time
  - Different series and factors transformation
- Performance
  - ~0.7 PP MAR in normal times
  - ~3.0 PP MAR in times of pandemic

Nowcasting with machine learning (ML) models







- Top-down
- Same data set as for DFM models
- Different ML methods
  - Random forest
  - xgBoost
  - Artificial neural network
- Performance
  - ~0.8 PP MAR in normal times
  - ~4.0 PP MAR in times of pandemic

How to go on?

- How to choose the right parameters for DFM?
- How to improve nowcasts using JDemetra+ Nowcast plugin?
- Bottom-up, top-down or combination of both?

- How to improve nowcasts with ML models?
- Or better give up on this track?

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