ECB Workshop on Forecasting Techniques

“The Anatomy of Out-of-Sample Forecasting Accuracy" by Borup, Coulombe, Rapach, Schütte and Schwenk-Nebbe

Discussion by Michel van der Wel

Erasmus U Rotterdam

June 13, 2023

Paper Summary

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  - Two metrics for importance of individual predictors for predicted target values
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- Empirical study of forecasting US inflation provides sensible leading predictors (oil, components of CPI) and discrepancies between in-sample and out-of-sample importance

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$$\phi_p = \sum_{Q \subseteq S \setminus \{p\}} \frac{|Q|!(P-|Q|-1)!}{P!} \left(E[f|Q \cup \{p\}] - E[f|Q] \right)$$

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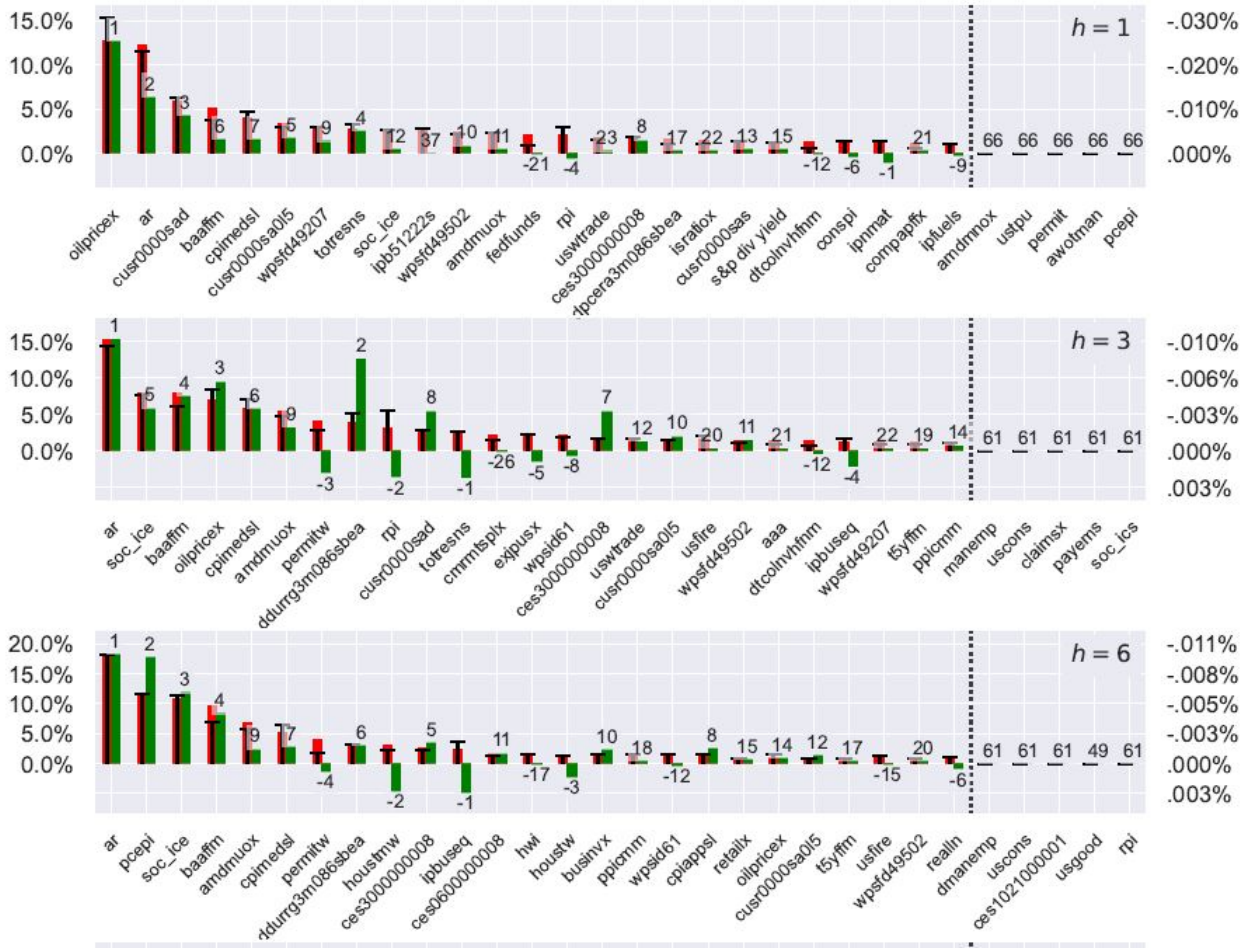
- Paper cleverly adjusts setting for
  - Dealing with large number of predictors (use sampling)
  - Expanding samples (not one value; take average)
  - Retraining of the samples $\rightarrow$ (i/o)Shapley-VI$_p$
  - Loss-function effects rather than predicted values $\rightarrow$ PBSV$_p$

1. Empirical findings (Figure 1)



- Stability of findings (pcepi least to 2nd most important $h = 1$ to $h = 6$)?
- Why not more correlated results (similar series in FRED-MD)?

2. Empirical application

- Curious to robustness regarding
  - Forecasting y_{t+h} rather than $\frac{1}{h}\sum_{k=1}^{h} y_{t+k}$
  - Including predictors and moving average of predictors
  - Selection of L (AR-lag) and q (MA-order)

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- For PCA, possible to compare with significance?

3. Lazy/Free-riding discussant

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- Can you take the panel nature into account? [You do!]
- Compare to `scikit-learn` package (which also provides feature importance estimates)
- Closer comparison of findings with existing literature and evaluation also of signs

Final point and conclusion

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In conclusion:

- Opens the black box with clever adaptations to time series setting
- Great work!

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