Discussion of "Short-Term Forecasting of Business Cycle Turning Points: a Mixed-Frequency Markov-Switching Dynamic Factor Analysis"

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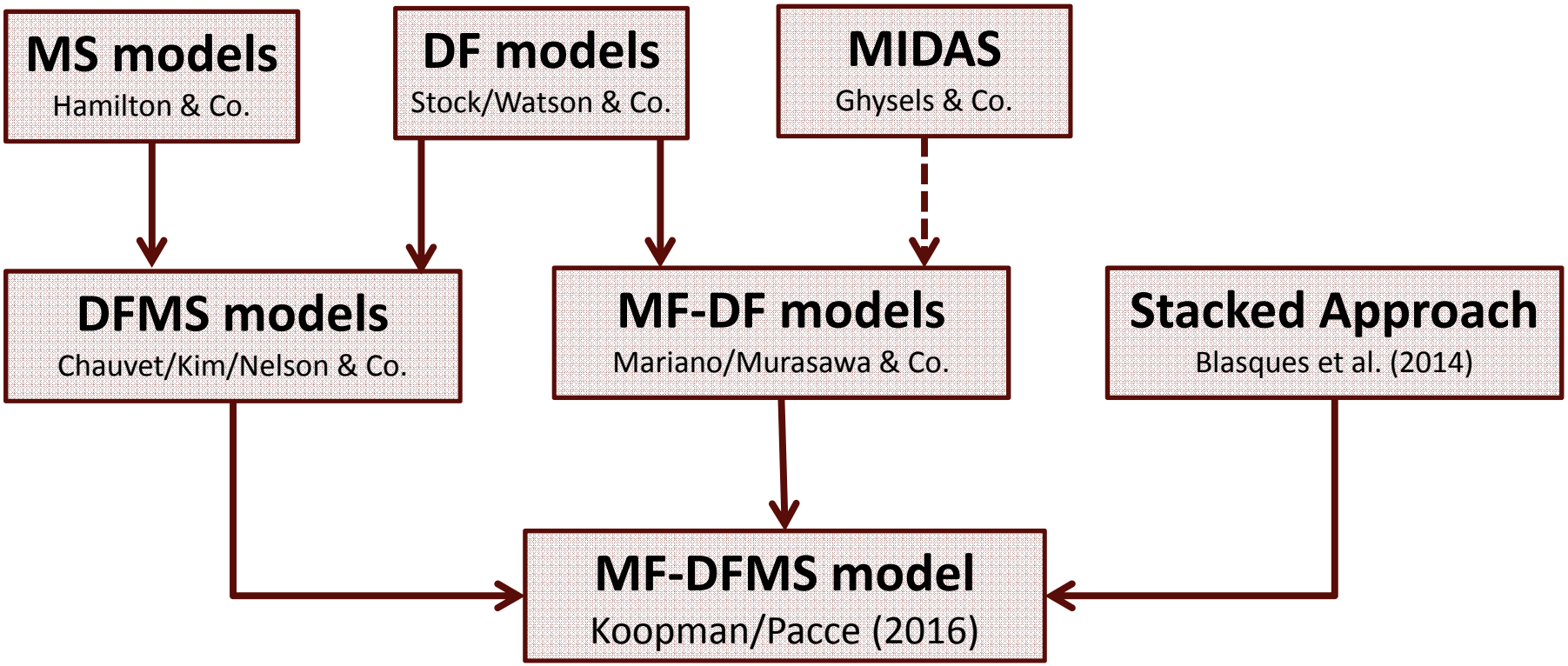
What Are the Paper's Contributions?

- Enriching the "stacked" approach for mixed frequency models by Blasques et al. (2014) with a Markov switching feature.
- Demonstration of how the obtained model can be estimated by Bayesian methods.
- Evaluation of MF-DFMS model in terms of ...
  - ... its ability to identify U.S. recessions and expansions in-sample;
  - ... its ability to anticipate business cycle turning points in real-time;
  - ... its ability to make good nowcasts for real GDP growth.

The MF-DFMS Model vs. Other Models



What I Am Going to Talk about

- Summary of the MF-DFMS model.
- Timing vs. strength of signals.
- Benchmarks for comparing GDP growth forecasts.
- Minor issues.

Summary of Model Features

- Key idea taken from Blasques et al. (2014): switch from monthly to quarterly frequency.
- Model is given by

$$\begin{bmatrix} y_t \\ x_t^q \end{bmatrix} = \begin{bmatrix} \beta_y & \beta_y & \beta_y \\ \beta_x & 0 & 0 \\ 0 & \beta_x & 0 \\ 0 & 0 & \beta_x \end{bmatrix} f_t^q + \varepsilon_t$$

$$f_t^q = M_{s_t} + \begin{bmatrix} 0 & 0 & \phi_f \\ 0 & 0 & \phi_f^2 \\ 0 & 0 & \phi_f^3 \end{bmatrix} f_{t-1}^q + \xi_t$$

  with $x_t^q = [x_{t,1}^q \; x_{t,2}^q \; x_{t,3}^q]'$ and $f_t^q = [f_{t,1}^q \; f_{t,2}^q \; f_{t,3}^q]'$.
- M_{s_t} takes care of the regime-switching means.

Timing vs. Strength of Signals

- Paper focuses very strongly on the following two timing issues:
  - Ability to match exactly the NBER dating.
  - Ability to generate early signals about turning points in real-time.

  $\Rightarrow$ Not many differences across the models that are considered in the paper.
- Not explicitly discussed: clearness/strength of signals.

- Both timing and the strength of signals are important for policy makers!

Timing vs. Strength of Signals

Evaluating Models Based on Their QPSs

- The quadratic probability score (QPS) is computes as follows:

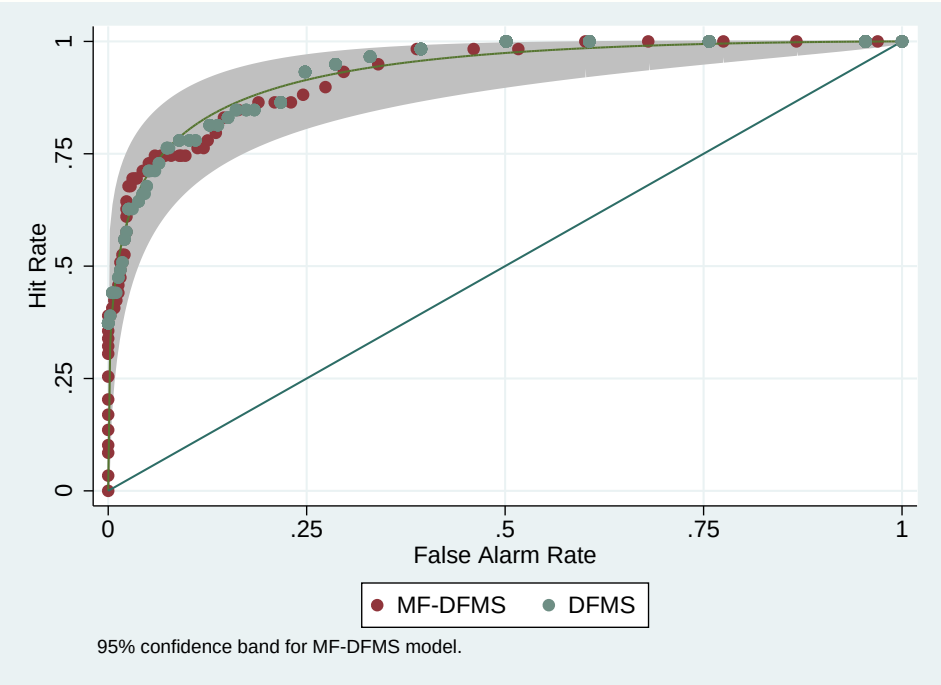
$$QPS = 1/T \sum_{t=1}^{T} (f_t - x_t)^2 ,$$

  where f_t denotes a probability forecast and x_t is the realization of the event.
- Based on the predictive probabilities in Fig. 3, I obtain values of 0.058 for both the MF-DFMS and the DFMS model for the full sample.
- Looking only at recessions, I obtain values of 0.29 for the MF-DFMS model and 0.33 for the DFMS model.
- Looking only at expansions, I obtain values of 0.022 for the MF-DFMS model and 0.016 for the DFMS model.

Timing vs. Strength of Signals

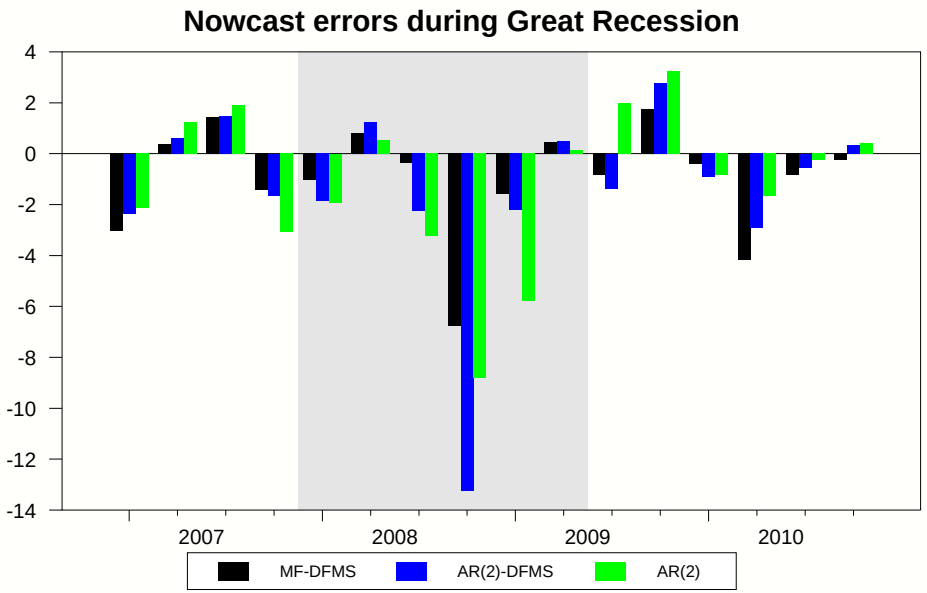
Receiver Operating Characteristic (ROC)

- Are recessions rare events? $\Rightarrow$ look, e.g., at ROC instead of QPS.
- Idea: compare "hit rate" and "false alarm rate" for different thresholds.
  - Note the difference to "complex" threshold used in paper.
  - Authors could show robustness of results with respect to different decision rules.



Benchmarks for Comparing GDP Growth Forecasts

- Paper presents only assessment vs. an AR(2) model.
  - What about tougher benchmarks?
- Add information about difference between MF-DFMS and AR(2)-DFMS.
  - Look at AR(2)-DFMS also for month 1 and 2.
  - AR(2)-DFMS model based on unbalanced panel approach?



- Maybe also look at h=2, 3, and 4?

Minor Issues/Questions

- Reversing the two parts of the paper title?
- Two different notations used in the paper (Section 2.2.1 vs. Section 2.2.2).
- Could you make the loading coefficients regime-dependent? Identification problem?
- First argument against ML estimation ("inference") not really important in the context of this forecasting paper.
- How do you demean in the real-time out-of-sample analysis? No explicit information given in paper.
- Maybe add table with overview about the timing of the publication process.
- Explicit explanation for why you refer to smoothed probabilities in Fig. 3?