

## Referee Report

### *“A financially stressed euro area”*

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#### ABSTRACT

The paper analyses 149 monthly time series on financial market stress conditions in the euro area. A factor model is used to extract common factors from the data set using the procedure suggested by Doz et al (2011). Further exploratory analysis is carried out (1) to investigate for which country certain factors have highest explanatory power regressing the financial data on the factors; (2) to investigate whether the factors are linked to real economic activity and economic sentiment by regressing economic variables on these factors. The paper finds that a “Periphery Banking Crisis” factor, a “Stress factor” and a “Yield Curve” factor explain the bulk of volatility in recent euro area financial data. The real-time forecast of economic activity is improved by including these financial factors.

#### COMMENTS

The topic of investigation is of high relevance. The appropriate econometric technique is applied.

I have some suggestions to improve the analysis and exposition of the paper:

1. The econometric exposition could be shortened. Those methods are rather well-known by now.
2. The method and findings should be compared thoroughly to other closely related analyses available in the literature, including in particular the following papers:
  - a. Hollo et al (2011) develop a systemic stress index particularly based on euro area data. This is mentioned, but differences could be discussed in more detail.
  - b. There are more approaches around that are using a factor model methodology, including the one used and regularly published by the Federal Reserve Bank of Chicago, a financial conditions index that uses a mixed-frequency factor model including explicitly also banking data. Another model is used by the Kansas City Fed. It would be useful and

important to compare the current proposal and analysis in some detail with those approaches.

- c. The first paragraph in Section 2.1 suggests that existing data sets often focus predominantly on prices. However, volume variables are also included in the financial conditions index of Hatzius et al (2010), so a comparison with that index (although that is constructed for the US) would be useful; at least this detail should be mentioned.
3. Table 2 to 5 should include some notes on the meaning of the coloring, since tables should generally be self-explained. This should also be adjusted in the tables in the Appendix.
4. Table 6 on the out-of-sample forecast comparison: It is easier to evaluate relative forecast accuracy of different models using the relative RMSFE relative to a benchmark, usually the random walk or a simple AR model. This should be done here. Table 6 should also include notes on the meaning of the bold print to make it self-contained such that the reader does not have to search the text for the explanation.
5. Section 2.2, first sentence: Delete “as it is state of the art” since it is not true that imposing a one common factor structure is state of the art.
6. For the forecast accuracy comparison it would be important to investigate whether the forecast performance of VARs with the financial factors are statistically significantly better than the benchmark model. It should be taken into account that a number of models are compared, not only two. The choice of the test depends on the benchmark model. If the alternative model does not nest the benchmark model, then White (2000) and Hansen (2005) proposals might be used. If the alternative model nests the benchmark model, then Hubrich and West (2010) might be used; see also Granziera, Hubrich and Moon (2014) for an overview of multiple model forecast comparisons.
7. I would like to see some plots of the actual forecasts. It seems somewhat surprising that the RMSFE changes only little between 1-month ahead and 6-month ahead forecasts. Please discuss.