

An early warning system to predict the speculative house price bubbles

REPLY TO THE REFEREE REPORT 2

Summarizing the suggestions of the referee:

1. Page 6, first paragraph: It would be helpful for the reader to start the paragraph giving a definition of a bubble. Having a definition it is clear why it is necessary to look at the fundamental developments. What are the approaches in the literature to determine bubbles? Is there a difference between boom and bubble? What the advantages to use the approaches applied? *Our reaction: The phenomenon of a bubble is addressed in the first paragraph. It is related to speculative runs in asset markets, i.e., to deviations from fundamental values or to deviations from trends, where the latter are used as a cross-check for robustness. It is the aim of the early warning system to judge whether these deviations are substantial or not.*
2. Page 6, equation 1: This equation is a dynamic equation because it includes the lagged endogenous variable. It is possible to its implicit long-run relationship. However, the long-run relationship is determined by a cointegrating relationship as long as the variables are nonstationary. *Our reaction: Possible cointegration relationships between the variables are implicitly taken into account in a dynamic specification. Non significant effects have been eliminated from the final equation.*
3. Page 7, equation 2: The fundamental real house price depends on the lagged-endogenous variable. In efficient markets the best predictor for the next period is the last observation. Smoothing the deviations by using a spline function is not convincing. *Our reaction: It is not the aim of the paper to test for efficiency in housing markets. In our view, forecasts of house prices can be improved if fundamentals are taken into account.*
4. Page 7, equation 3: The standard deviation of the cyclical component is not time depending. Therefore, it includes information over the whole sample. Information which is not available at real times. *Our reaction: The standard deviation is used in order to construct a chronology of real-estate speculative bubbles. Like the NBER chronology it should be a final one and to be subject to no revisions. Therefore, we need a criterion based on the whole information set.*
5. Page 7, third paragraph: The factor 0.5 is very small. Other studies use greater values. What are the arguments in favour of such a small value? Please give a list of the considered countries. Please give a hint that an unbalanced panel is used. How are the house price indexes normalized? *Our reaction: We tried various values and 0.5 turned out to be the optimal. The list of considered countries together is contained in Table 5. We added the hint on unbalancedness of data.*
6. Page 8, line 5: Please mention the survey of early warning systems given by Yucel (2011). Different approaches are mentioned by Detken, Gerdesmeier and Roffa (2010). *Our reaction: The surveys of Detken et al. (2010) and Yucel (2011) are now mentioned.*

7. Page 8, line 17: Please mention the smoothing parameter of the Hodrick-Prescott approach. *Our reaction: It is done in the updated text.*
8. Page 9, equation (4): Please give a reference for this accuracy definition. The minimum of this measure is 0. The maximum of this measure is 2. This is the case if C and B are zero and A and D are nonzero. *Our reaction: This is our own measure.*
9. Page 9, equation (5): Please explain R_{it} . *Our reaction: It is now explained immediately after equation.*
10. Page 10, line 7: Please mention the starting point of your selection routine. Some variables include lags, however, not all. How are the standard errors determined? *Our reaction: It is a kind of general-to-specific approach: We start from a general model, including the maximum amount of lags for all variables. Then, the statistically insignificant coefficients are dropped. In the regression, only statistically significant coefficients remain. Standard errors are computed in a standard way.*
11. Page 11, line 11: Please mention Diebold, F.X. and G. Rudebusch (1989) for the QPS. *Our reaction: The article of Diebold and Rudebusch (1989) is now mentioned.*
12. Pages 12-14, References The reference list includes a lot of discussion papers. Meanwhile some are published. Moreover, Palmer is missing. *Our reaction: The list of references is updated. Reference to Palmer is contained immediately after his quotation, there is no need for an additional entry in the reference list.*
13. Page 18, Table 4: Please swap columns. The new ordering should be: country, estimation sample, number of bubbles, average duration of a bubble. *Our reaction: The columns are swapped.*

References

- Detken, C., D. Gerdesmeier, and B. Roffia (2010). Interlinks between money, credit and asset prices and their implications for consumer price in ation: Recent empirical work. In L. D. Papademos and J. Stark (Eds.), *Enhancing Monetary Analysis*, pp. 307–327. European Central Bank, Frankfurt am Main.
- Diebold, F. X. and G. D. Rudebusch (1989). Scoring the leading indicators. *Journal of Business* 62, 369–402.
- Yucel, E. (2011). A review and bibliography of early warning models. MPRA Paper 32893, University Library of Munich, Germany.