Ms. Ref. No.: 2015-8

Title: Do Soaring Global Oil Prices Heat Up the Housing Market? Evidence from Malaysia

RESPONSE TO REVIEWERS' COMMENTS

I would like to thank the anonymous referee for the insightful comments. I agree with all the comments raised by the referee. In the following, I specify how I am going to take the referee's comments into account when revising the manuscript.

Comment 1

This paper seeks to investigate the macroeconomic effect of oil prices on housing prices in an oil-exporting country. This is an interesting question and the author describes why, theoretically, demand could be shifted out (e.g., in migration) or shifted in (e.g., Dutch Disease) following a positive shock to oil prices. Thus, an empirical exercise is well-motivated.

Response:

I would like to thank the referee for this encouraging comment.

Comment 2

My main issue lies in the fact that both the model and the empirical implementation of the model have almost no description. This makes it difficult to understand what exactly is being done here for a general-interest reader. The description that is included is focused less on the "big picture" and more on technical details.

It would help to write down the system of equations being estimated. Buried on page 4 (within the Literature Review), we are told that there are four endogenous variables besides housing price growth in the estimated model. It would be nice to make this more transparent.

Response:

I fully agree with the referee that it would be clearer to write down the model being estimated. This will be addressed in the revised version of the manuscript, as follows.

The baseline model consists of oil price (*oilp*), housing price (*housep*), labor force (*labor*), consumer price index (*cpi*) and lending rate (*lendr*). All the variables are in natural logarithm except for lending rates, which are defined as ln(1+rate(in percentage)/100), which is a common transformation in literature.

The VAR model is based on quarterly data for $y_t = (oilp_t, housep_t, labor_t, cpi_t, lendr_t)$.

The reduced form VAR is given by:

$$y_t = c + \sum_{i=1}^{p} A_i y_{t-i} + D_t + u_t$$

where c is a vector of constants, p denotes the lag length, A_i are the 5×5 parameter coefficient matrices, and u_t is a vector of error terms.

Comment 3

Equations 1, 2, and 3 in the Results section have no description. The author states that they "compute modified versions of the cointegration ADF tests of Engel and Granger, as well as modified Z_t and Z_alpha tests of Phillips and Ouliaris". How are these tests modified? What are the variables in these equations? What do the model specifications C, C/T, and C/S stand for?

Response:

In line with the referee's comment, I am going to make it explicit in the revised manuscript that: Compute modified versions of the cointegration ADF tests of Engle and Granger (1987), as well as modified Z_t and Z_α tests of Phillips and Ouliaris (1990) are, respectively, ADF^*, Z_t^* and Z_α^* as described in Equations [Eq.1], [Eq.2], and [Eq.3] in page 15 of the original manuscripts.

I will also put a note in the revised manuscript that: The details of how these tests are modified in the Gregory and Hansen (1996) cointegration test are provided in pages 104-106 in Gregory and Hansen (1996). To conserve space, they are not presented here.

Further, I agree with the referee that there is a lack of the description of model specifications C, C/T, and C/S in the Gregory-Hansen method section. The following paragraphs will be added in the revised manuscript:

"The Gregory-Hansen (1996) test allows to assess if cointegration amongst variables of interest holds over a first period of time and then, in an a priori unknown period T_b (the timing of the change point), it shifts to another long run relationship.

This study employs three different models C, C/T and C/S corresponding to the three different assumptions concerning the nature of the shift in the cointegrating vector: the level shift model (C), the level shift with trend model (C/T) and the regime shift model (C/S). To model the structural change, the step dummy variable $D_t(T_b)$ is defined as: $D_t(T_b) = 1$ if $t > T_b$ where 1(.) denotes the indicator function, and $D_t(T_b) = 0$ otherwise. The three models: C, C/T and C/S representing the general long-run relationship are respectively defined as follows:

$$y_t = \mu + \theta D_t(T_b) + \alpha' x_t + u_t \qquad [\text{Eq. 1}]$$

$$y_t = \mu + \theta D_t(T_b) + \alpha' x_t + \beta t + u_t \qquad [\text{Eq. 2}]$$

$$y_t = \mu + \theta D_t(T_b) + \alpha' x_t + \delta' x_t D_t(T_b) + u_t \qquad [\text{Eq. 3}]$$

where y_t is a scalar variable, x_t is an m-dimensional vector of explanatory variables (both x_t and y_t are supposed to be I(1)), u_t is the disturbance term, parameters μ and θ measure respectively, the intercept before the break in T_b and the shift occurred after the break, while α are the parameters of the cointegrating vector, β is the trend slope before the shift, and δ is the change in the cointegrating vector after the shift.

The standard methods of testing the null hypothesis of no cointegration are residual-based. Ordinary Least Squares (OLS) are employed to estimate Equations (1), (2), and (3), and a unit root test is then applied to the regression errors (Gregory and Hansen, 1996). The time break is treated as an unknown and is estimated with a data dependent method. That is, it is computed for each break point in the interval $[0.15T, 0.85T]$ where T denotes the sample size (Zivot and Andrews, 1992). The date of the structural break will correspond to the minimum of the unit root test statistics computed on a trimmed sample."

Reference

Gregory A, Hansen B. Residual-Based Tests for Cointegration in Models with Regime Shifts. Journal of Econometrics 1996; 70; 99-126.

Comment 4

A more detailed description of the data would be helpful, including a table of summary statistics.

Response:

I completely agree with the referee that including a table of summary of statistics would be informative for readers including general-interest readers. This will be added in the revised manuscript.

Comment 5

In the second paragraph of the "Empirical Framework" section, the author refers to a TY procedure, which has not yet been defined.

Response:

TY refers to Toda-Yamamoto. I agree with the referee that this should be clearly stated. In page 12 of the original manuscript, I actually stated "Toda-Yamamoto (TY hereafter)" in the first line of subsection 4.3. However, as the referee pointed out, this should have already been placed in page 10. I will address this in the revised manuscript.

Comment 6

It would be nice to have more description of the geography in Malaysia and how it relates to the oil industry. In other words, given that Malaysia is not contiguous, would certain areas be impacted more or less by oil shocks?

Response:

I strongly agree that including more description of the geography in Malaysia and how it relates to the oil industry would be interesting. This will be added as a brief and concise paragraph in the revised manuscript.

Further, I support the referee's opinion that since Malaysia is not contiguous, the impact of oil shocks across areas might be different. However, an insightful examination of this matter is beyond the scope of this study. This analysis also requires comprehensive data at provincial level which might not be that readily available.

Comment 7

Could we get an idea of how Malaysia compares worldwide in its housing price growth and involvement in oil? In other words, would these findings be of interest for other countries?

Response:

I agree that addressing this comment would be helpful in extending the motivation of this study. This will be discussed in the revised manuscript. To give a brief answer, I believe that the findings for the case of Malaysia would be helpful for policymakers in net oil exporting countries, especially with emerging markets.

Comment 8

There is too much going on in the Results section. I think that the paper would benefit from creating another section that describes the methodology and moving some content there.

Response:

I completely agree with the referee that some content in the Results section, for instance, half of the content in page 15 of the original manuscript, could be moved to the Empirical Framework section which describes the methodologies used in the study.

I will also put the final paragraph of the Results section in page 19 in another subsection called "Robustness checks" in the revised manuscript.

I would like to keep the remainder of the Results section in the revised manuscript, including presenting the empirical findings of the study, explaining why such findings occur and their implications, as well as comparing the findings of this study with other studies.

Comment 9

I would suggest expanding the motivation a bit more.

Response:

I agree with the referee and will address this comment in the revised manuscript by extending further the motivation in the Introduction section of this study.