Referee report for

"Housing Market Bubbles and Business Cycles in an Agent-Based Credit Economy",

By Erlingsson, Cincotti, Stefansson, Sturlusson, Teglio, and Raberto

The authors present an agent-based model of the economy based on the EURACE framework and calibrate it to mimic the Icelandic economy. Subsequently, the authors experiment with different levels of access to mortgage credit using numerical simulations. The results reveal, in a nutshell, that more lax credit constraints results in on average higher but more volatile GDP growth and all accompanying effects.

In my view, this is a well written and interesting paper using a rather complete model of the economy. The sensitivity analysis on credit constraints make sense and are relevant in the current policy debate. Given the heavy machinery the authors apply, however, the results of the sensitivity exercise are not particularly surprising to me. I wouldn't say that the stability result is an "emergent" property of the agent based model. The paper would therefore benefit if the authors would take the analysis one step further and delve deeper into the question of credit constraints. I'll get into more detail on this issue below.

Main comments:

- The model is based on the EURACE model and simulator. I have two remarks in this respect. 1) The authors should make clear where the added value of their model is relative to the original one. 2) Currently, the authors take 14 pages to describe the (mainly existing!) model, followed by 12 pages of results. When reading the paper, it takes somewhat long before it gets to the most interesting results. I would suggest the authors to compress the model section and extend the results section.
- Some thoughts regarding the model (note that I'm not implying that the authors should implement these into the model, but they could reflect on the choices made).
    - There is no rental market. This forces all households into the housing market and could therefore aggravate macroeconomic fluctuations due to fluctuations in house prices.
    - The position of the equity fund is somewhat artificial in that they own all equity shares and there is no trading. Can households sell their part of the equity share to

buy, for example, a house or to consume? Is it strictly necessary to have the equity fund as intermediary?
    - Construction firms effectively have backward looking expectations when deciding on construction decisions.
    - Households can only buy one housing unit per period. This is restrictive; can households have an investment motive when buying a house?
- The model is currently set up using parameters from the Iceland economy. Please comment on the numbers to what extent they are unique to the Icelandic situation or comparable to other small open economies.
- As mentioned above, it would be interesting to extend the analyses one step further beyond the current sensitivity to β. Some possible extensions that come to mind (in random order):
    - Different levels of β yield different paths for the economy. Which, however, is 'best'? Clearly, the model is not micro-founded in the sense that households choose lifetime consumption levels to optimize some utility function. This could complicate welfare analyses, but perhaps the authors can implement some metric that weights average lifetime consumption to volatility in consumption.
    - The mortgage rate is currently a fixed two percent above the risk-free rate set by the central bank. It could be an interesting exercise to have banks set the mortgage rate to reflect the current credit risk in the market (condition on, for example, leverage or house price developments).
    - A final possible extension is to tap into the monetary policy debate whether CBs should target asset markets. Currently, the CB uses a standard Taylor rule to set the interest rate. The authors could extend it by including a measure of the house price (over)valuation. How does this interact with β?

Minor comments:

- Typo on page 3, final paragraph of Section 1: "We then AND describe the most…"
- I'm not sure what the journal prefers, but personally I prefer capitalization of "Table", "Section", "Figure", etc.
- Typo on page 9, second paragraph: "As a consequence, THAT when…"

- Page 28: In the conclusion, the authors mention “our complex economic system”. Try to avoid the word “complex” in this context; does it refer to the complexity issue in agent-based models? Or do you mean to say “difficult”?