Referee Report

Manuscript: "The E-Monetary Theory"

The manuscript "The E-Monetary Theory" studies the role of endogenous money supply for the transmission of monetary policy in the presence of financial frictions. To this end, the author develops a New Keynesian model with a stylized money market with two types of money, zero-maturity deposits (ZMD) of private agents and reserves of banks. ZMD are used for settling transactions in the private sector, while reserves are used for transactions between banks. The need for money for households is rationalized by a cash-in-advance assumption. Moreover, households face an exogenous borrowing constraint. Using his model, the author analyzes the implications of monetary policy. For unconventional policy, conducted through asset purchases, his findings suggest that the policy has expansionary effects in the short-run but contractionary effects in the medium-run, especially if the central bank mechanically keeps its policy interest rate lower for a long period of time.

Overall, this manuscript studies a topic of major importance to researchers and policy makers. The author proposes a model which potentially allows for studying the effects and, in particular, the transmission channels of balance sheet policies by central banks. As one of only few in the literature, this paper highlights the role of money supply in transmitting monetary policy shocks. This may potentially help to gain novel insights for understanding the efficacy or non-efficacy of balance sheet policies conducted in many advanced economies since the Great Financial Crisis. With this report, I discuss several issues (distinguishing between major and minor points) that might be interesting for the authors to consider when revising the manuscript.

Main concerns:

1. The mechanism driving the key results under quantitative easing (QE) is unclear.

   What are the exact economic mechanisms that lead to QE being expansionary in the short-run and contractionary in the medium run? This does not become sufficiently clear in the paper. From the explanations given in the paper, the lower interbank bank rate would depress returns on capital leading to lower investment and consumption in the medium-run. This would result, combined with the gradual reduction of (gross) asset purchases, in a contraction in the endogenous money supply and period of deflation. Are the results that QE is only effective in the short-run by expanding the money supply, an artifact of mechanically keeping the interbank rate fixed for a long period of time? The separate contribution of QE and mechanically low interest rates to the results is unclear.

   Adding to the confusion is the fact that it is unclear what policies are compared in Figure 4. What scenario is considered under "Taylor" as indicated in the legend? Is it the one described in Figure 3? This would mean that in this scenario the interbank rate is not

mechanically kept fixed for 100 quarters. A clearer and more systematic analysis is needed, which is discussed in the next bullet point.

2. The analysis is incomplete.

   To completely understand the effects of QE, the following analysis is warranted:

   – Step 1: What is the role of an effective lower bound on the interbank rate in the model economy? Figure 3 studies a mild recession in which the interbank bank remains unconstrained. I would suggest to construct a construct a scenario, triggered by a large, persistent capital constraint shock, that would lead to an endogenously binding interbank rate for a certain period of time. A "lower-for-longer" policy could be introduced by an interest rate peg.

   – Step 2: Study a large contractionary capital constraint shock with and without QE

   – Step 3: Study different scales of QE

   – Step 4: Study different fade-out horizons for QE Does the effect of QE depend on the persistence of the process for asset purchases relative to the number of periods at the lower bound?

3. The impulse responses in Figure 4 look very unusual.

   The impulse responses for output, consumption, ZMDs and inflation have an unusual shape. One obvious explanation is that it is not possible to find a unique rational expectations solution for this model. The convergence to steady state is achieved by construction. This can be particularly seen for the real balances of ZMDs and output. The solution algorithm assumes that the model is back at its steady state in the last period (here, 300). However, it seems that ZMDs and output have diverged rather than converged in the periods before.

   What generates the unusual behavior in the variables, showing no clear pattern in the first 150 periods? It needs to be clarified whether the source of the behavior is multiplicity of equilibria, non-existence of a model solution or numerical issues going back to the algorithm. Otherwise, it is not clear to which extent the results are really reliable. Since Figure 4 represent one of the key results of this paper, this is a major concern.

   Furthermore, the scale of QE seems very large, resulting in an increase of reserves by 700%. One argument for this approach is the fact that the reserve constraint would no longer be binding in this case. More intuition for this approach is warranted. Would QE have an effects at all if the reserve constraint is still binding? Furthermore, the interest rate peg is unusually long, reaching 25 years.

4. Examine the role of banks.

   In the model framework, banks are effectively modeled as consumers, seeking to maximize an infinite stream of utility from a consumption good. This way, banks' demand directly

affect the real economy and influencing prices and inflation. This contrasts established approaches in the literature that model bank as financial intermediaries (e.g. Gertler and Karadi (2011,2013)).

It would be interesting to understand whether differences in monetary policy transmission compared to the New Keynesian model can be attributed to the special role of banks. One approach would be to show to which extend proposed model nests the standard New Keynesian model in the absence of any financial frictions.

Minor concerns:

- The quality of the graphs and tables and the presentation of the models need to be improved.

For the tables, it would be advisable to clearly show the balance sheets for banks and the central banks. This way it is easier for the reader to understand the money market and the transactions that are undertaken in the model economy. The legends of the figures (particulary, Figures 2, 3 and 4) have typos or partially completely unclear. In some cases, there is no explanation provided in the paper, e.g. "Taylor" in Figure 4. Furthermore, the presentation of the model should be further improved. The variable $\tilde{x}_t$ in Section 3.2 was never introduced (it is most likely shares of wholesale firms, x_t). A figure showing the relationships between private sector, banks and the central bank would be very useful.