

Unemployment Benefits and Financial Factors in an Agent-Based Macroeconomic Model

Reply to Referee Report 1

We want to thank the referee for useful comments and suggestions. Now, we briefly answer to the various items and, after the second referee's comments, we will revise the paper following the recommendations provided by referees and readers.

- **Title: I found the term “Financial Factors” in the title of the paper too unspecific, i.e. not informative enough. What does it refer to? The financial situation of business firms or the (active) role played by the central bank in the policy experiments. I thus suggest to modify the title of the paper such that it is immediately clear for the reader.**

We will modify the title in order to clarify the role of financial factors in our agent based macroeconomic framework when unemployment benefits are introduced.

- **Page 1, line 3: Here we have “Riccetti et al. (2012)” while in the references it is 2011. See also page 4, line 1 and so on.**

The referee is right. There is a missing reference in the bibliography at the end of the paper. Riccetti L., Russo A. and Gallegati M. (2012) “An Agent-Based Decentralized Matching Macroeconomic Model” (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2163581). We will add this reference to the revised version of the paper.

- **Page 3, line 4 from below: “whch” should be “which”.**

The referee is right. We will correct this typo.

- **Page 4, paragraph starting with “Many papers ...”: Besides citing the more policy related papers it may make sense to mention some other (general) agent-based macro models, such as “Deissenberg, C., van der Hoog, S. and Dawid, H. (2008). 'EURACE: A Massively Parallel Agent-based Model of the European Economy. Applied Mathematics and Computation, 204, 541-552”, “Haber, G. (2008): Monetary and fiscal policy analysis with an agent-based macroeconomic model. Jahrbücher für Nationalökonomie und Statistik, 228, 276-295“ or “Lengnick, M. (2013): Agent-based macroeconomics: A baseline model. Journal of Economic Behavior and Organization, 86, 102-120” just to help the interested reader to get an overview over the field. Of course, there are many more papers one could cite here. In addition, two other papers on the use of agent-based models as tools for economic policy design include “Westerhoff, F. and Franke, R. (2012): Agent-based models for economic policy design: two illustrative examples. BERG Working Paper No. 88, University of Bamberg” and “Westerhoff, F. (2008): The use of agent-based financial market models to test the effectiveness of regulatory policies. Jahrbücher für Nationalökonomie und Statistik, 228, 195-227”.**

Thanks for the suggestions. We will enrich the literature review.

- **Page 5, beginning of Section 5: I suggest to recall once again that the model is related to Riccetti et al. Moreover, replication of agent-based model results becomes more and more important. Did you think about adding your computer code to the**

Appendix? One nice feature of e-journals is that space is not really restricted! Could be a good idea ...

We will provide the code or maybe a more general pseudo-code so to allow the replication of results

• **Page 5, line 3 from below: “After” should be “Afterwards”.**

Ok.

• **Page 8, eq. 7: I suggest to explain (7) a bit more in detail and to recall what $p_{\hat{}}$ is.**

Ok.

• **Page 9, eq. 9: I suggest to recall what n_{ft} stands for.**

Ok.

• **Page 12, Section 2.6: The point which worries me most with this paper is that the role played by the central bank is not clear enough. What exactly does it mean to reduce the gap in the credit market? I suggest to give an equation which formalizes the behavior of the central bank. In the first paragraph of Section 3 it is said that the central bank sets its interest rate to 1 percent and does not change it. Then this implies that, over the business cycle, the central bank plays a rather active role during your policy experiments in the sense that it provides a lot of liquidity to the credit market, right? Please clarify this. Is this realistic?**

We will provide some additional details in order to clarify the behaviour of the central bank in our agent based macroeconomic framework. The role of the central bank is indeed important when we consider business cycle fluctuations and the effects of policy experiments. For sure, public intervention is sustained by the central bank which is committed to buy outstanding government securities. So we show that the positive effects of macroeconomic policy are, at least partially, due to the coordination of policy makers. However, the role of the central bank over the business cycle is not excessively important, given that banks enlarge and reduce their credit exposure on the basis of households' deposits, so playing a very central role in influencing the macroeconomic evolution through the leverage cycle. Moreover, the provision of liquidity to the credit market by the central bank is a quite realistic feature if we think about securitization through which private banks create financial products that can be used as collateral to ask for money also from the central bank.

• **Page 13, Figure 1: You may want to add some more panels to Figure 1 to illustrate the functioning of your model. Why don't you add other macro variables?!**

We do not insert many other macro variable because the overall analysis of the baseline model is reported in Riccetti, Russo and Gallegati (2012), working paper submitted to another Journal, while we focus on new results regarding the introduction of unemployment benefits in this version.

• **Page 16, Table 2: Here the average interest rate is reported with roughly 9 percent (no unemployment benefits) and 7.6 percent (unemployment benefits). Is this the interest rate given by eq. 4? Since the central bank charges only 1 percent I wonder**

whether these averages may be regarded as realistic. It is also interesting to see that nominal/real interest rates are decreasing while employment and thus production increase.

The referee is right. The interest rate is set by equation 4; the spread endogenously emerges and it seems a bit larger than the real spread. A possible development of the model could regard the validation of simulations results, as for instance the spread between the interest rate paid by firms and the policy rate, as well as many other variables at various degree of disaggregation. However, in this version we just want to sketch some interesting macroeconomic features as the qualitative results reported in tables and displayed in figures.

We can confirm that interest rate is negatively correlated with employment.

• Section 4.2: The sensitivity analysis is limited to parameter n . I don't want to overstress the issue with the central bank but what about doing some robustness checks here? Is it possible to add a Taylor-type interest rate rule instead of the constant interest

We will try to add a Taylor-type interest rate rule instead of the constant interest rate.