Social Networks and Macroeconomic Stability
Response from the authors

This is a summary of some revision work which we are now carrying out in response to referees' valuable suggestions, for which we are most grateful.   In light of their suggestions, our work for the revised version can be largely separated into three major parts.

First, it is generally about the writing of the paper, the background, the introduction, the skeleton, the research questions, the proposed hypotheses, the literature, and some slacks and redundancies.   We, of course, will go through these suggestions and make necessary adjustments to illuminate what have not been sufficiently clear and make the whole paper more coherently tight.

Second, it is about the experimental designs. Referees have made several proposals for us.   Before a meaningful response can be made, we have to first admit that whatever we will take, we still end up with very limited sampling among the vast space of network topologies.   Therefore, at this initial stage, our sampling plan is to have a reasonable coverage, reasonable in the sense that they are representative enough to cover different characterizations of network topologies.   By that we don't mean an exhaustive list of all possible characterizations, but those which are frequently mentioned is the network literature.

On this basis, we can certainly add a few more samples, as the referees suggest, for example, small-world network with different rewiring probabilities if that can make our samples be more representative in terms of the included characterizations. However, if it does not, then this idea, as millions of many others could make tremendous computation efforts with no avail.   Also, on this basis, if we miss some very essential characterizations, as important missing variables, then we should take them in.   For example, we plan in our revised version to take a measure of degree distribution into account, as one of the referees nicely suggests. To our best knowledge, this characterization has not been formally given a measure yet in the literature.   What we plan to do is to use entropy as a measure.

However, even though after we include few more experiments and more samples and introduce an additional characterization of networks, the question with regard to robustness still remain so long as the finger is pointed toward the infinite

huge space not covered by our limited experiment.   We believe that some lessons which we gained from our limited experiments should be used as a support for the hypotheses which are very intuitively formulated in this paper, and those intuitions, once confirmed, should already have a position, at least, as a research target for further pursuing.   On that, robustness is really just a matter of degree, rather than a crispy `yes-or-no'.    We believe that this kind of pragmatic attitude is not just applied to this paper, but generally to all research in the direction of the `new kind of science' (as coined by Stephen Wolfram), which of course includes agent-based modeling.

With this understanding, we, however, would like to make an additional effort to bring in the role of the intensive choice (lambda), as this parameter has proved to be as a pivotal one in agent-based financial markets as well.   Hence, another set of experiments in this direction will be done to see whether the network will be fundamentally sensitive to this random-choice parameter.

Third, it is the statistical (regression) model which we employ to examine the hypotheses.   Referees also make various kinds of suggestions, from the functional form to missing variables and to the appropriate estimation method.

Before coming to the regression model, let us also mention a related issue, which is the statistical significance of the numbers showing from Table 3 to Table 6. This research initially started with some limited sampling of the chosen network topologies.   The purpose is to gain some preliminary understandings through limited trials; hence, this stage is very qualitative.   We later on move to a more rigorous attempt based on more extensive sampling in terms of a large coverage of different network characterizations, and this second stage is, therefore, quantitative. Nonetheless, we will provide the statistical significance result in the revised version to make the comparison presented there more convincing.

About the regression model, referee 1 has made two suggestions, one to our experimental design, and one to econometrics applied to get the result.   We believe that these two suggestions can be handled by, first, including, one independent variable which represent different distributions of degree, and, second, by trying a SUR (seemingly unrelated regression) to allow the possibilities of the cross-correlation of the residuals.

As for the possibility of non-linearity in our regression, maybe the most general

form to handle the issue is to use the low-order polynomial equations (which may include square, cube and cross-products).   This will introduce many more variables, and we have to decide how economize this doing. The key is to see whether we can have some additional good insight from this exploration, instead of making this paper be rather technical in an econometric way.

This finishes the summary of what we are doing right now or what we plan to do as the immediate next step.   Again, we are most gratefully for referees' very valuable suggestions.