Referee report MS 2456

"Cheap Talk by Multiple Senders in the Presence of Network Externalities"

The paper analyzes a cheap-talk communication setting with two senders and a receiver. The authors aim to analyze a situation where senders exerience network externalities. They use out of equilibrium beliefs to implement punishments for senders that do not send the same message, these are referred to as cross-checking strategies. The authors analyze the case with and without noisy signals for the senders. My comments with regard to MS 2456 can be subdivided in comments with regard to the structure of the paper, the contribution of the paper and the analysis or more detailed comments.

Structure of the paper

The structure of the paper lacks coherence:

- The related literature is placed at the end of the paper, instead of after the introduction.
- First part of the proof in the Appendix does not have a reference in the main text, nor does it state in the Appendix what Proposition is actually proven.
- No reference in the text to Figures 3-5 in the Appendix. What is the added value of Figures 3-5 to the paper?
- The model section does not clearly state the network externalities that are considered in the abstract and introduction of the paper. The reader can not find the effect of these network externalities on the utility of senders.
- The examples mentioned in the introduction do not seem to match the analysis very well. Perhaps considering the advisor-sender literature could offer examples that link better to the analysis of the authors. The network externaliteis of consumers of an experience good or professors with regard to reference letters are not very straight forward.

Contribution of the paper

The contribution of the paper is not clear from the introduction and the abstract, or even the analysis:

• The contribution of the paper is not clear and quite some related papers seem to be missing in the references. McGee and Yang (2013) appear to analyze a similar situation as the authors, but their setup is more clear. Ambrus and Takahashi (2008) also missing in the reference list. Galeotti et al (2013) also seem to analyze a comparable (but more extensive) situation.

- You only analyze the case with two senders and then state in the conclusion that the case with n senders is analoguous but too difficult to solve. I doubt whether the conclusions would be the same for n senders. Even with noise in the limit the receiver learns the distribution of the signal and does not need a cross checking strategy. For a paper that analyzes network externalities, the n sender case analysis seems to be important.
- The examples in the introduction (reviewers of products, professors and reference letters) it does not seem so likely that m_1 influences U^{S2} or even that *a* influences U^S . There are already models that consider cheap talk, where messages influence the payoff of senders that seem very relevant for your paper which are not in the literature review. Kartik (2009) analyzes cheap talk with lying costs for example.

Analytical comments

- In the model section you exclude the probability of a fine or punishment of the senders (because they send different messages), because you only consider symmetric equilibria (page 6, after the definitions), hence where $s_i^*(v_i) = s_j^*(v_j)$ if $v_i = v_j$. Also the utility functions do not show any punishments on page 5.
- Proposition 2 shows one particular equilibrium which exists next to the babbling equilibrium under certain conditions. This equilibrium implements the out of equilibrium belief $b(\underline{m})$ which includes a punishment if $m_1 \neq m_2$. The implementation of punishments for senders not in the utility function of the sender, but in the beliefs of the receiver are not common. What are the implications of this method for the outcome of the model?
- It is not clear whether Proposition 4 and 5 hold for every distribution of u(a) (and every distribution of θ or ε_i) or only for distributions u'(a) > 0 and u''(a) < 0, or only exponentional distributions. The linear distribution of Proposition 3 also does not clearly state whether u(a) has to be linear or $U^S(a, \theta)$, neither does the linear distribution seem to meet the condition in the model section (page 5) of u'(a) > 0 and u''(a) < 0. The effect of all the different distributions on the outcome of the analysis is not clear.
- The abstract mentions that the model considers a cheap talk model with multiple speakers where their utility function is increasing in size. At the moment the authors do not analyze the situation with more than two senders, neither is their utility increasing in the networksize. One would expect the utility function of the sender to be a function of n, hence $U^{S}(a, \theta, n)$, which is not the case at the moment.
- The situation in which senders receive negative utility if they send different messages is not the same as giving the receiver the option to (cross) check

the sender's messages. If two senders send an inflated message or an incorrect message, but the same message they will receive no negative utility in the one case, but they will in the other.

Detailed comments

- Page 5, third paragraph: "R chooses an action $a \in A$, which is a network size." I do not understand what a network size means in this context.
- Page 6, definition 2: a truth-revealing equilibrium is not an equilibrium where $s^*(v) \neq s^*(v')$ for any $v \neq v'$, but an equilibrium where the sender reports according to the strategy $s^*(m = v)$ for any v. or where $s^*(v_i) = v_i$
- Noisy case: the whole analysis seems to be driven by assumption 3-II. The authors do not explain why they make this assumption and what the impact of it is on the analysis.

References

- Ambrus, A., & Takahashi, S. (2008). Multi-sender cheap talk with restricted state spaces. Theoretical Economics, 3(1), 1-27.
- Galeotti, A., Ghiglino, C., & Squintani, F. (2013). Strategic information transmission networks. Journal of Economic Theory, 148(5), 1751-1769.
- Kartik, N. (2009). Strategic communication with lying costs. The Review of Economic Studies, 76(4), 1359-1395.
- McGee, A., & Yang, H. (2013). Cheap talk with two senders and complementary information. Games and Economic Behavior, 79, 181-191.