

## **Title: Cost-reduction innovation under mixed economy**

### **Discussion Paper No. 2015-68**

Thank you for your detailed and helpful comments. We would improve and clarify the manuscript accordingly. The followings are our replies and ways to reflect your comments.

In this paper a two-stage duopoly game is analyzed, when one of the firms maximizes profits and the other one maximizes profits plus weighted consumer average. This second firm is called a semipublic firm, where the degree of privateness of the firm is given exogenously by the weight attached to the consumer surplus term in the objective function of the firm. In the first stage firms invest in innovation with quadratic costs and in the second stage the firms compete in quantities for exogenously differentiated products with linear demand. Comparative statics is performed on the firm privateness parameter mentioned above.

While the model is solved correctly as far as I can tell, the paper in my opinion does not represent a significant contribution to the existing literature, as I argue in the following lines.

First, methodologically it is a straightforward application of very well known models like for instance d'Aspremont and Jacquemin (1988), which should be cited. The results of the model should be related to these previous well known models, and an explanation should be provided when the results differ.

Second, in order to become a relevant paper to describe a mixed economy, the model should be more general and should not depend so much on specific assumptions. Particularly, it is not clear what role and interpretation the assumptions in the first lines of page 6 play.

To improve the paper the authors should provide a more complete interpretation on the results they obtain, the role of the different assumptions they adopt and the consequences of the relaxation of the different assumptions. They should also provide

a guideline for possible empirical implementations for the model.

Finally, it is recommended that the paper is proofread as it is full of grammatical and stylistic mistakes.

**Reply:** Firstly, as stated in the introduction part of the paper, the model established in the manuscript differs from existed literature in many aspects. Mainly, this paper contributes to the related literature by analyzing the effects of the public degree in mixed oligopoly on innovation. Of course the results are related to some well known models like the one established by d'Aspremont and Jacquemin (1988). We would cite them in a revised version, while some of the results are quite different and further explanation would be added. Here is an example. In a standard Cournot setting, if a firm becomes more aggressive, the output of this firm increases and the output of the competitor decreases. This logic, however, does not apply in our paper. Compared with the current version, several possible reasons would be added in a revised version, including the fact that firms also invest in order to reduce costs and the chosen objective of the (semi) public firm.

Secondly, the role of the assumptions in the first lines of page 6 is to guarantee the existence of the unique solution of the model. Without the assumption, the solution could be pointless. Additionally, a more general model does help to improve the discussion, but it is hard to make such change in this paper. Instead, we prefer to relax the specific assumptions of the model in further research. Meanwhile, more detailed and complete interpretation of the results would be added in a revised version, as well as the assumptions of the model.

Thirdly, the paper would be proofread carefully as recommended and the grammatical and stylistic mistakes would be corrected as possible as we can.