Comments on "Cost-reduction Innovation under Mixed Economy" by Pu-yan Nie and Yong-cong Yang

This paper studies the cost-reduction innovation behaviour of a duopoly market where a private firm faces competition from a firm which has some degree of public ownership/control. The publicly owned firm's objective is (assumed) to maximise weighted sum of the firm's profit and consumer surplus. Importantly, the rival firm's profit does not enter its objective function. That is, public ownership does not lead to care about all components of social welfare – it is biased against the rival firm. This objective function makes the publicly owned firm a more aggressive competitor of the rival firm than a counterpart private competitor. This is the key difference between a mixed duopoly and an ordinary duopoly.

It is well known and understood that firms with market power (e.g., ordinary duopolists) do not internalise some of the externalities in their profit maximising behaviour. The externalities include the deadweight loss and benefits of innovation accrued to the consumer. So it is not too surprising that the publicly owned firm (in theory) should innovate and produce more relative to the private rival, or a private counterpart. Indeed these are among the results (or their implications) reported in Propositions 1 and 4 of the paper. What is somewhat surprising is that higher degree of public ownership also makes the rival firm (as well as the publicly owned one) to innovate and produce more in equilibrium, as is claimed in Propositions 2 and 3. It seems that cost-reduction appears to be strategic complements: the best response to rival's more innovation is more innovation. The robustness of these results is worth further investigation. They are interesting.

Some minor comments:

- Expressions (5) and (6) give the appearance that innovation and quantity decisions are simultaneously made while in fact they are sequentially made.
- A typo in expression (5): Should the consumer surplus part not be $\frac{\tau}{2}(q_A^2 + q_B^2 + 2\gamma q_A q_B)$?