Responses to referee report 1

The authors appreciate the referee's insightful comments and suggestions. Here we respond to the following questions.

1. Thank you for poring over our article and reminding us to mention further about our main contribution. As the referee's opinion there are three differences comparing to Wang et al. (2010): the exposition is clearer and more intuitive; the paper adds exogenous imitation; and the paper analyzes the welfare effects. Under consideration that the IPR protection influences the return of innovation and thus economic growth, in the paper we emphasize the role of the IPR protection during the path of economic growth. Therefore we present literature which regards to the IPR protection. According to our knowledge about IPR protection (introduction paragraph 1 on page 1), there is no literature discusses the issue in a franchise bargaining system. Because the appropriation of rents is central aspect of R&D-based growth model whose engine of growth is the return to innovation, the franchise fee through bargaining is in terms of rent to affect economic growth. Hence we discuss the issue in a franchise bargaining system. Finally we find a more general solution and show that Wang et al. (2010) exists a corner solution in the framework of present paper. (Eqs. (12)-(13) on page 6)

    Beside, in the typical R&D-based growth model, increasing the IPR protection will increase the economic growth. However, if the patent is permanent protection, there exist deadweight losses for social welfare. However, in present paper which introduces a franchise bargaining system can eliminate the double marginalization fully or not fully which affects the degree of social welfare. Therefore, we analyze how the bargaining power and IPR protection affect the social welfare.

2. Thank you for your valuable suggestion. We agree the referee provide us an interesting novel assumption. We will revise our explanation about imitation. Under the revised version we still can prove that each product will command a different price and thus there exist two types of franchise fees, one for firms without imitation and another for competitive firms. Then firstly, if the technology is perfectly protected when $q \to 1$, Eq. (12) and Eq. (13) on page 6 reduce to Wang's (2010) forms. And secondly, if the patent is imitated means $q \to 0$, it will come out another types of price and franchise fee. (Please see Eq. (12) and Eq. (13) on page 6) That's why we have shown the more general solutions which are different from Wang et al. (2010).

3. We appreciate the referee agree the results in the propositions 2 and 3 are good because the results are common in the majority of growth models with imitation. We believe this is one of our contributions to the theory of economic growth.