Title: **Bigger the better: Optimal fishing with price premium**

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**Abstract**

In their classic Beverton-Holt fisheries model, price of fish was per unit weight, which was held constant. The price per fish, which is a product of per weight price and the weight of a fish, will then increase as the fish grow larger (and heavier). This lead to the intertemporal trade-offs between harvesting today and tomorrow in their model. However, anecdotal evidence shows that, in addition to the mechanism considered in their original model, larger fish often fetch higher price arising from an increase in per unit weight price. For example, in small pink shrimp fishery in Japan a 15kg-box of larger shrimp would be auctioned at much higher price than a box with smaller shrimp. This paper extends the Beverton-Holt model to incorporate the price premium – an increase of per weight price – associated with the size (weight or length) of harvested fish. The existence of such price premium adds another dimension to intertemporal trade-off of whether to harvest today or in the future; the opportunity cost of today’s harvest is not merely less fish stock tomorrow but also forgone additional value from the growth of that fish. The results of the model are consistent with our intuition, and further interesting extension of the model is discussed.