

# **A Theory of Consumption with Inventories**

Junmin Wan<sup>1</sup>

Faculty of Economics, Fukuoka University

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## *Abstract*

We use an infinite continuous time framework to model the effects of price difference on a consumer's purchases, consumption, and inventories of storable goods. By closed form solutions under sufficiently necessary conditions, it is shown that consumption, frequency and quantity of purchases, and inventories over lifetime are simultaneously determined. The purchase is interval and its volume increases with price difference. Although the optimal path of consumption is smoothing when inventory does not occur, it is cyclically with inventories sawtoothed because of repeatedly explosive purchase (or BAKUGAI in Japanese) and time-dependent inventory cost.

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*Keywords:* price difference, interval purchase, inventory, cyclically sawtoothed consumption, storable goods

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<sup>1</sup> Correspondence: Nanakuma 8-19-1, Jounan Ward, Fukuoka City, Fukuoka 8140180, Japan; (e-mail) wan@econ.fukuoka-u.ac.jp;

(tel) +81-92-871-6631(ext.4208); (fax) +81-92-864-2904.