Tow-period expenditure allocation problem

We solve how consumers allocation basket goods between two stores. Per period income is . Store 2 is a wholesale club store, which charges a lower unit price, . Consumers choose the optimal allocation between two stores for the two periods.

We derive comparative statistics of expenditure share w.r.t income, price, and quality.

## Baseline model with no liquidity constraints

Consumers freely allocate the sum of two-period income between two stores. Focus on the expenditure share of store 2, i.e., .

1. Income effect. If we assume that store 2 is sufficiently high quality, then expenditure share at store 2 is decreasing with income, but the response is relatively flatter with high income.
2. Price response. Share of store 2 is less responsive to price changes when store 2 has higher quality or income is high.

## Model with liquidity constraints

Consumers incur borrowing fees when they consume out of the second-period income in the first period. Meanwhile, store 2 sets the minimum quantity that one can purchase, . We have three possible outcomes:

1. The liquidity constraint is not binding, consumers can allocate their income within two periods as freely as in the baseline model, and their quantity level is above the minimum quantity limit.
2. Store 2 is still attractive and consumers want to purchase from it despite the borrowing fees, then consumers will purchase the minimum requirement with the first-period income and borrow some from the second period.
3. If the minimum quantity limit is completely infeasible, i.e., , then consumers have no choice but only buy from store 1.

Implications

1. If liquidity constraints are not binding, then comparative statistics are similar to that in the baseline model. The response to borrowing rate, b, is negative, but is smaller with large income.
2. Because of the possible outcomes (2) and (3), there are large regions where expenditure shares are fixed, i.e., consumers do not response to changes in income, borrowing rate, price, or store quality.

## Extension

We extend the basic model to the case that store quality is a function of product assortment and travel cost. A store is perceived to have a high quality with better assortment (e.g., more brands to choose from). Assume that the better-assorted store is farther than the other store, but also can save consumers shopping time to offer one-stop shopping.



Now consider the value towards assortment. .

If the distance outweighs the efficiency, consumers value the assortment negatively. Conversely, consumers favor going to the store with better assortment if efficiency beats distance. However, the positive favor declines with lower travel cost.