

Liquidity Constraints, Storage Costs, and Consumer Stockpiling

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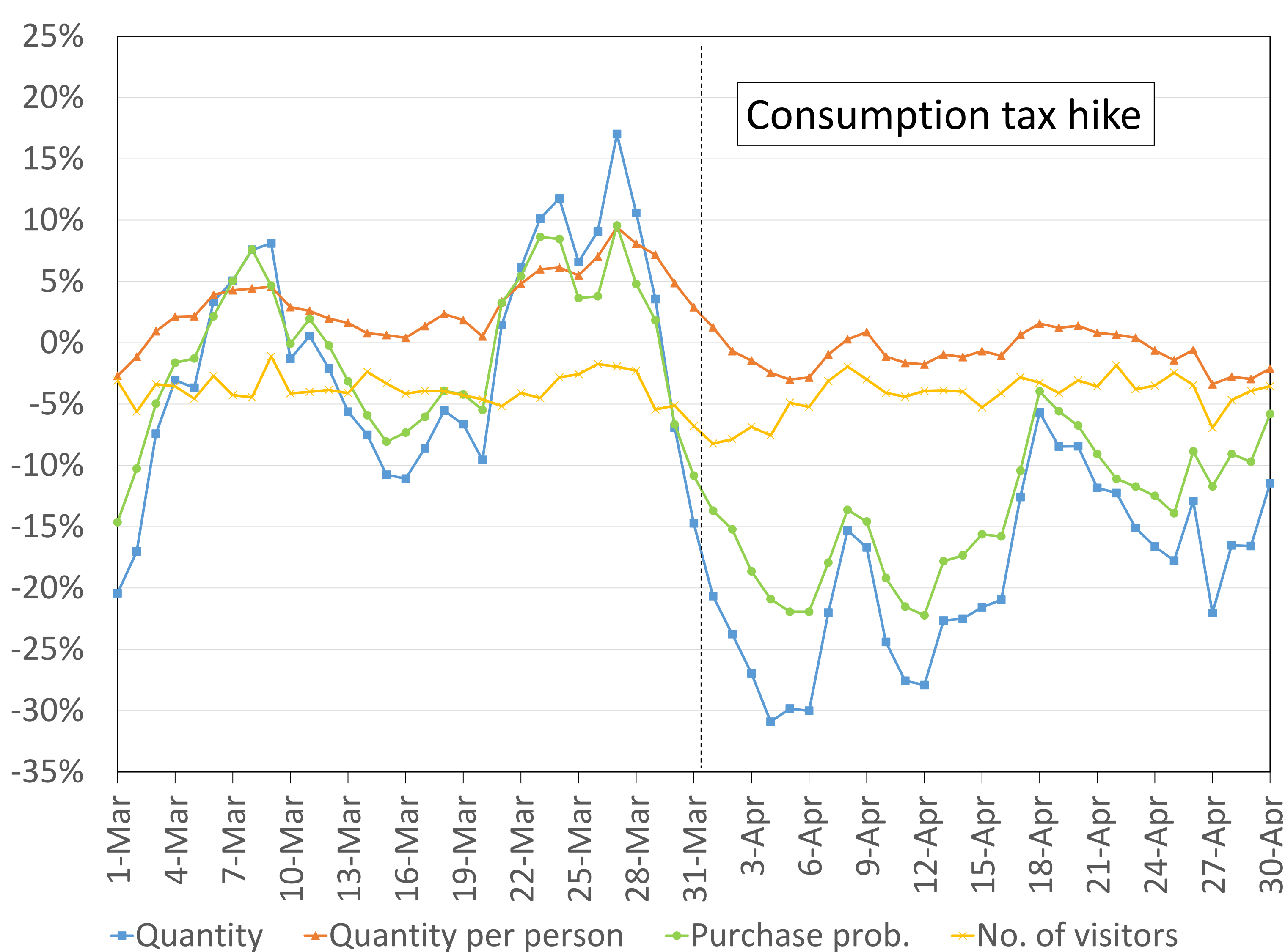
Abstract

Liquidity constrained consumers may be prevented from stockpiling goods, so that they may have difficulty in consumption smoothing. This study tests this hypothesis focusing on Japan's consumption tax hike in 2014, which provided consumers with a strong incentive to stockpile storable goods before the tax hike. This study, using scanner data with consumer IDs, provides three types of evidence suggesting that consumers' stockpiling behavior is affected by liquidity constraints.

Introduction

It is widely recognized that consumers stockpile storable goods in response to intertemporal price changes (see, for example, Boizot et al. 2001 and Hendel and Nevo 2006). These studies analyze stockpiling behavior during regular promotional sales, which temporarily reduce prices of particular goods sold at particular stores. In contrast, this study focuses on Japan's consumption tax hike in 2014, which increased prices of a large range of goods in most stores. This means that consumers had a strong incentive to stockpile storable goods before the tax hike, which provides a useful case study to examine consumer stockpiling behavior.

Figure 1: Quantity of cup noodles purchased



Notes: Figure 1 shows developments in purchases of cup noodles, an example of storable goods sold at Japanese supermarkets, around the consumption tax hike on April 1, 2014. The blue line denotes the year-on-year rate of change (one-week moving average) in the quantity purchased. Changes in the quantity purchased can be decomposed into three components: changes in the quantity per person conditional on purchase (orange line), the probability of purchases conditional on store visit (green line), and the number of visitors (yellow line).

Evidence #1: The orange line shows that some consumers did not reduce purchases of storable goods after the tax hike, even though the tax hike was anticipated in advance.

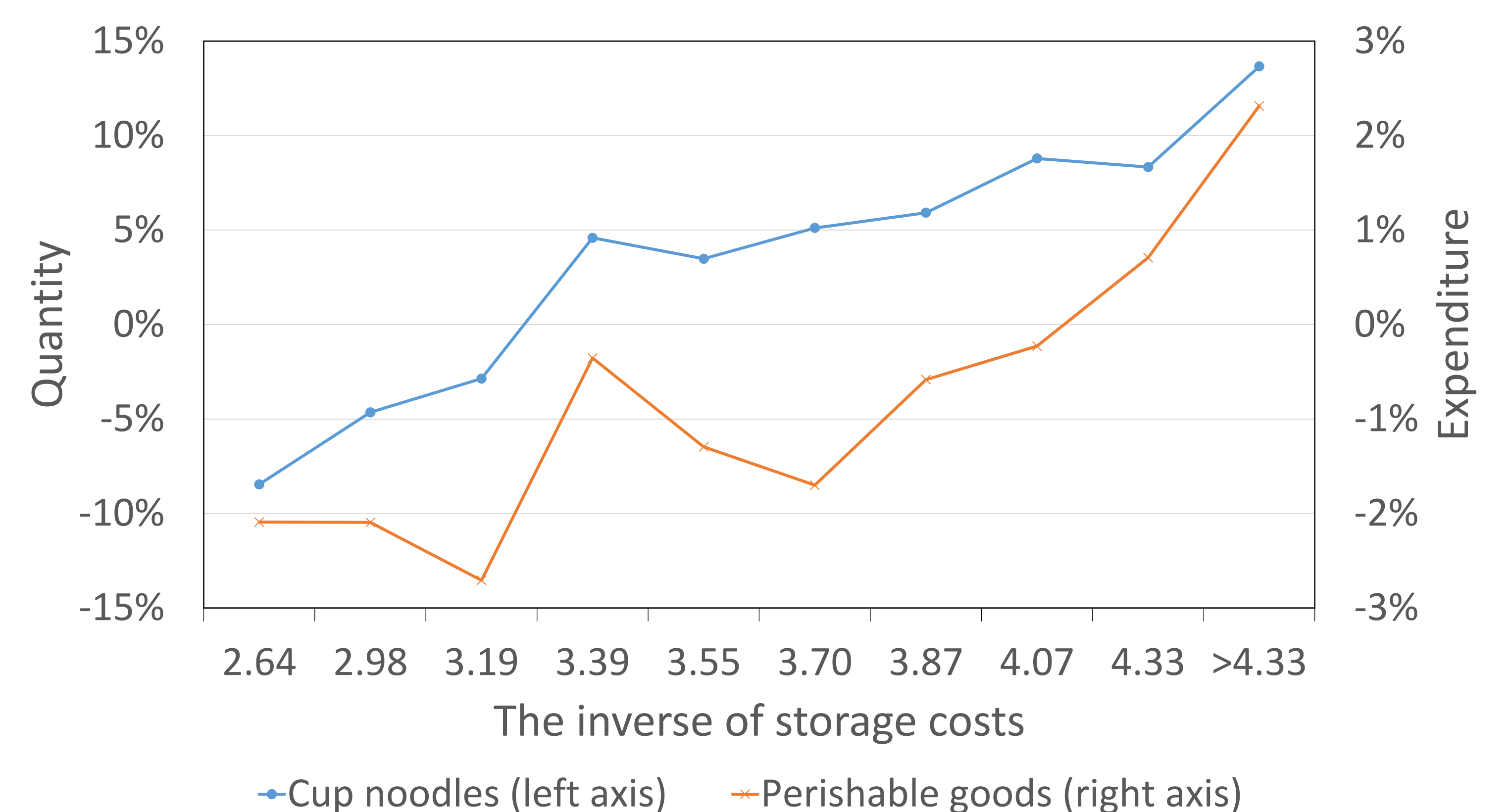
Analysis of Storage Costs

A straightforward explanation for why these consumers did not respond to the consumption tax hike is that their storage costs were relatively high. To test this hypothesis, I empirically estimate storage costs of each consumer following the model developed by Boizot et al. (2001) and examine the relationship between storage costs and purchasing behavior.

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Figure 2: Storage costs and purchasing behavior



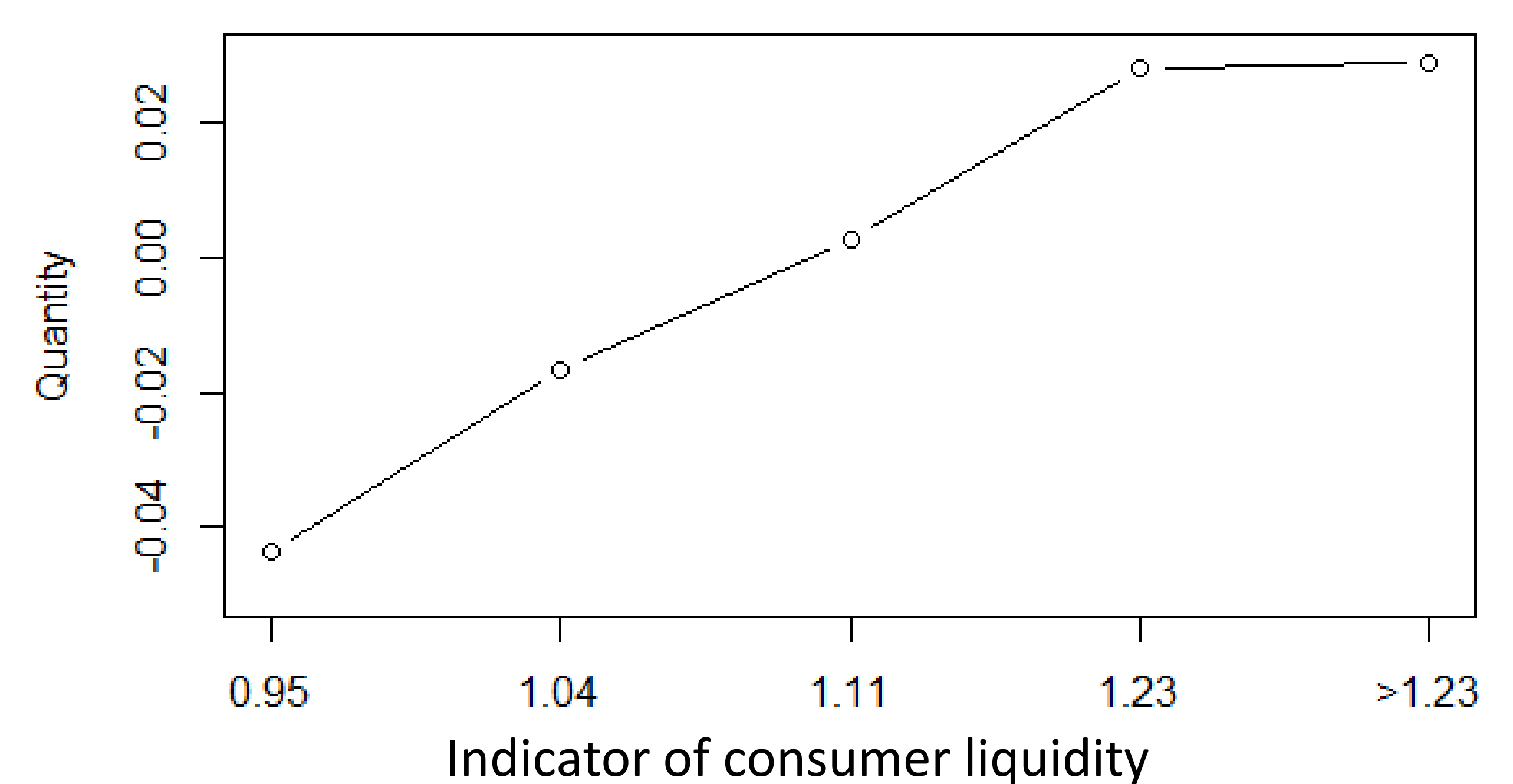
Notes: In Figure 2, consumers are divided into ten groups based on their storage costs, and the mean quantity of cup noodles as well as the mean expenditure on perishable goods in March 2014 (calculated as the year-on-year rate of change) are plotted.

Evidence #2: A sizable fraction of consumers increased purchases of storable goods before the tax hike, while reducing purchases of perishable goods, which cannot be explained by storage costs only.

Analysis of Liquidity Constraints

Evidence #1 and #2 suggest that consumers faced liquidity constraints before the tax hike. To identify liquidity constrained consumers, I use the price each consumer paid relative to the average price as an indicator of liquidity. This indicator reflects the fact that wealthier consumers typically buy higher quality goods at higher prices (as discussed by Bils and Klenow 2001). On the other hand, this indicator may be orthogonal to storage costs because the relative price does not include aspects of quantity.

Figure 3: Consumer liquidity and quantity purchased



Notes: In Figure 3, consumers are divided into five groups based on the relative price they paid in 2013, and the mean of the quantity of cup noodles purchased in March 2014 after controlling for taste heterogeneity is plotted.

Evidence #3: As liquidity constraints become slacker, the amount purchased increases to some extent. Moreover, there appears to be a threshold (kink), which divides consumers into the constrained and the unconstrained.

Conclusion

I show that stockpiling behavior of constrained consumers are indeed restricted by the amount of liquidity they have available in Japan's case. This finding is in contrast with the finding obtained by Hendel and Nevo (2006) that lower-income households are more price sensitive, suggesting that liquidity constraints are irrelevant to stockpiling behavior.

References

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