

Small Price Responses to Large Demand Shocks

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Introduction

- ▶ We study the pricing response of supermarkets to shocks that profoundly reshape their customer base or alter shoppers' willingness to spend.
- ▶ We show that the level of prices and retailing strategies more broadly reacted little, consistent with flat supply curves.

IRI Dataset

Time coverage	Weekly from 2001 to 2011 (574 weeks)
Type of observations	Units sold and revenue at barcode-store level
Number of observations	~4 million per week, ~ 2 billion in total
Product coverage	29 categories of personal care, housekeeping, and food products
Within-product coverage	All items sold by stores within each product category
Geographic coverage	50 U.S. metropolitan markets
Stores	~1,500 grocery establishments

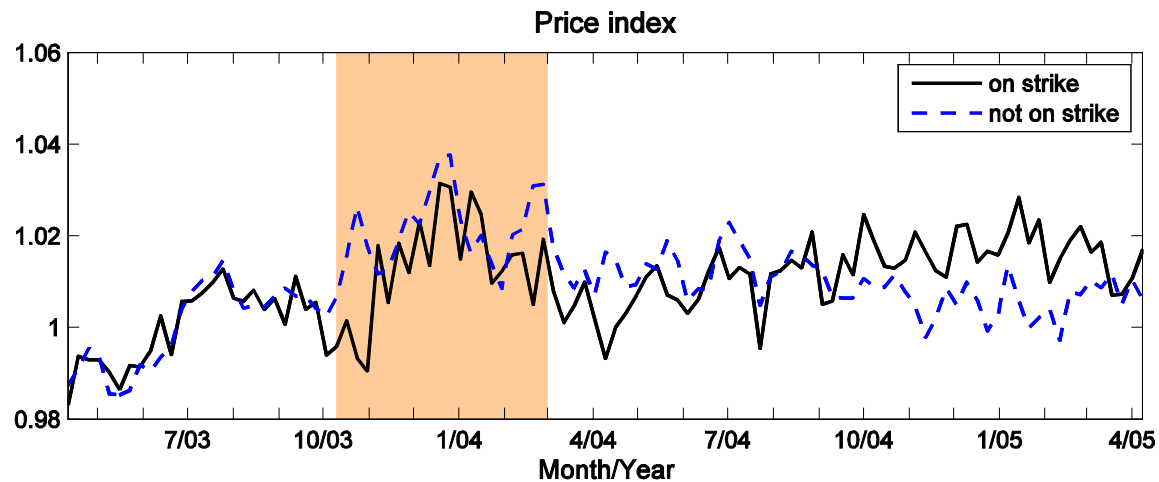
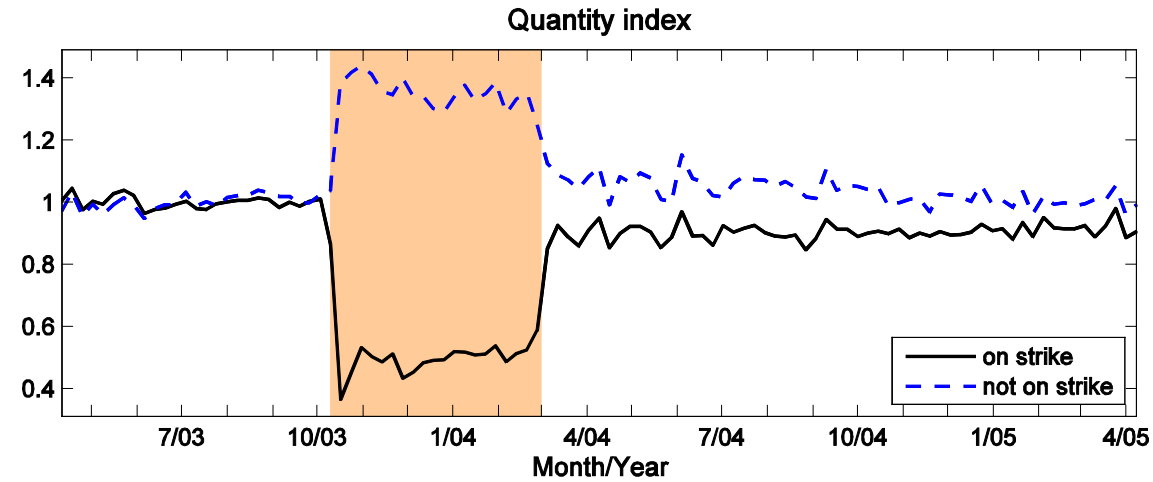
Shock 1: Labor conflicts

- ▶ Many shoppers would rather take their business elsewhere than cross picket lines, labor conflicts can profoundly reshape store frequentation.
- ▶ The 2003-2004 Southern California strike is the longest in U.S. supermarket history (nearly 5 months).
- ▶ Stores on strike remained open throughout the conflict and continued to advertise.

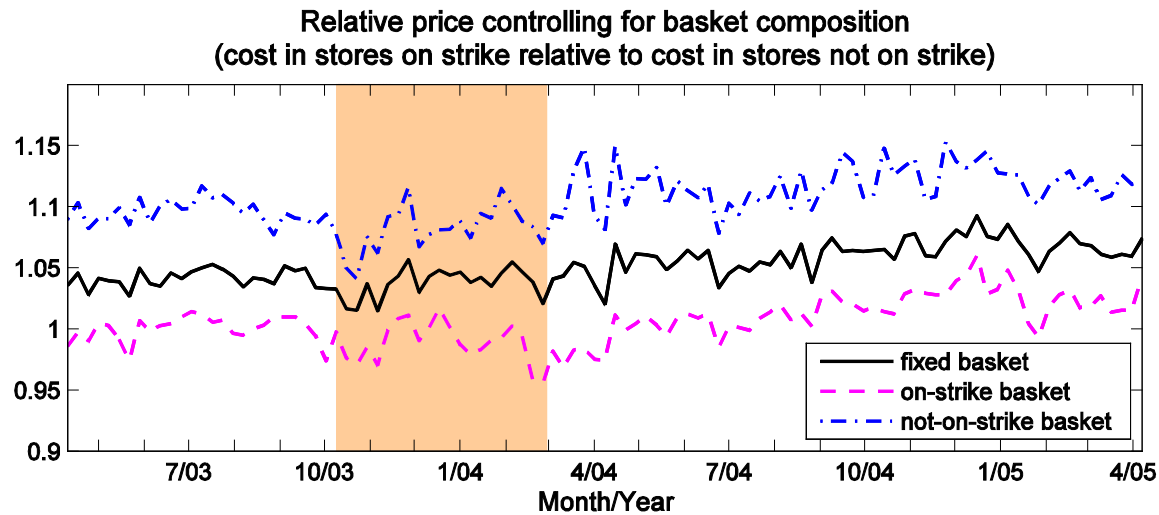
Identification: exogenous demand

- ▶ Stores not on strike had no supply disruptions, making the surge in their demand is a positive demand shock.
- ▶ Stores on strike suffered from supply disruptions. Nonetheless, they kept shelves stocked, suggesting that a collapse in demand drove the plunge in their sales.
- ▶ At the end of the conflict, stores on strike regained only 4 out of every 5 dollars in lost business, providing another source of variation in demand.

Labor conflicts



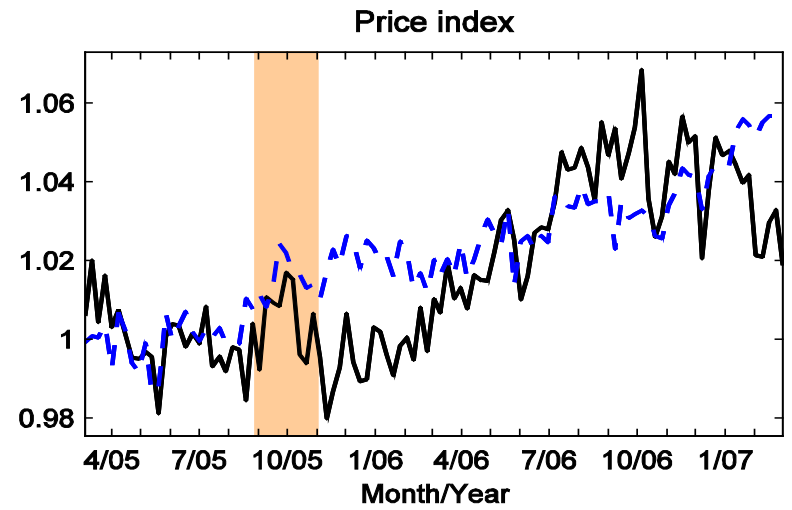
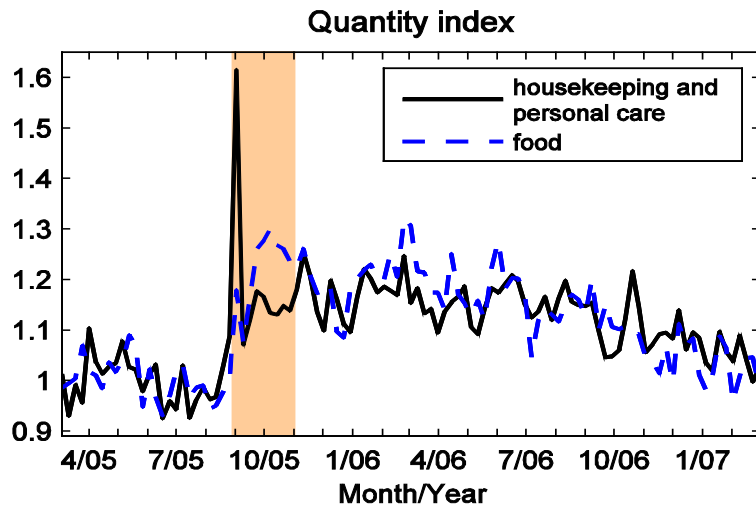
Labor conflicts



Shock 2: Mass population displacement caused by Hurricane Katrina

- ▶ Hurricanes are unambiguously exogenous to retail activities.
- ▶ Katrina was responsible for the loss of 1,200 lives and displaced 1 million persons; three quarter of those displaced in New Orleans reported living with family or friends.
- ▶ Stores located in areas that received an inflow of refugees experienced, on average, a persistent rise in sales volumes of 20 percent.

Some observations



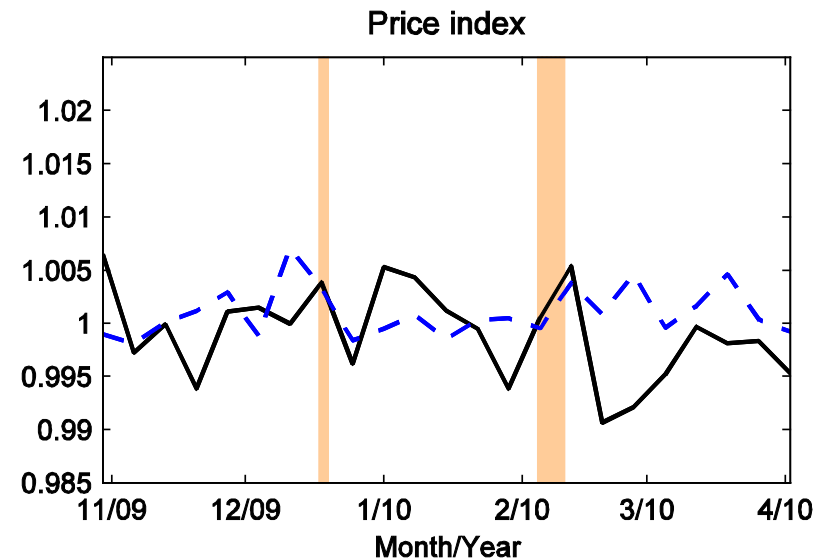
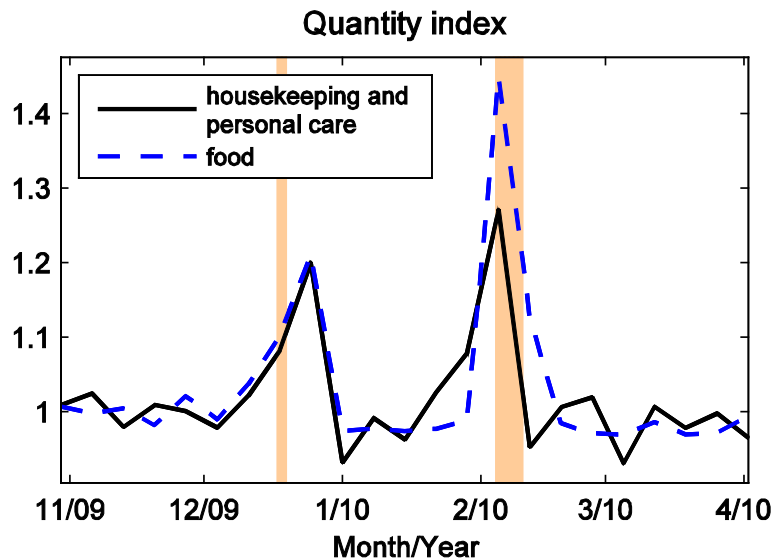
Some observations

- ▶ If we measure the price impact as the rise in the New Orleans price index in excess of the average rise for IRI markets not directly affected by Hurricane Katrina, then our estimate of the short-run (10 weeks) elasticity of supply is only 0.03.

Shock 3: shopping sprees around major storms

- ▶ Demand for products in our sample jumps around major storms because households engage in greater home production, notably consuming more meals at home.
- ▶ We identify 59 combinations of an IRI market and a snowstorm whose disruptive consequences were favorable to the triggering of a shopping spree.
 - ▶ These storms were either ranked in the top 5 percent of historical storms by NOAA and/or were granted an "emergency" or a "disaster relief" status by FEMA;
 - ▶ Most storms feature a jump in revenues of 10 percent or more.

Winter 2009-10 in Washington, DC



Summary

- ▶ Our analysis suggests that supermarkets do not take advantage of peaks in demand of varying duration to boost prices.
- ▶ This evidence is consistent with flat short- to medium-term supply curves in the retail sector.

Some implications for economic modelling

▶ Most plausible channels

- ▶ Flat marginal cost combined with constant markups:
 - ▶ Eichenbaum, Jaimovich, and Rebelo's (2011) and Fabiani *et al.* (2006) provide evidence of constant markup rules.
 - ▶ Acquisition cost is nearly 80 percent of grocers' revenues, suggesting that other costs components have a small imprint on prices.
 - ▶ Rules out stories that rely on decreasing returns, such as Burstein and Hellwig (2007).
- ▶ Fairness: Retailers may be reluctant to raise prices for fear of antagonizing consumers (Kahneman, Knetsch, and Thaler (1986) and Rotemberg (2005, 2011)).

Comparison to other (demand) shocks

- ▶ Our finding that retail prices respond little, if at all, contrasts with the findings that retail prices comove with factors typically understood as demand drivers:
 - ▶ Labor slack: Beraja, Hurst, and Ospina (2015), Coibion, Gorodnichenko, and Hong (2015) and Gagnon, Lopez-Salido, and Sockin (2015) show that retail prices comove negatively with local labor conditions.
 - ▶ House prices: Stroebel and Vavra (2015).

Comparison to other (demand) shocks

- ▶ **What could be the reasons?**
 - ▶ Regional character of our shocks: unlikely given that identification of other shocks is also based on their regional character.
 - ▶ Nature of shocks: When unemployment rises, people have more time to shop, which could put downward pressure on markups. Response to shocks with fairness element could also be different.
 - ▶ Identification of other shocks: Perhaps shocks with local unemployment/housing also mix supply elements.

Conclusion

- ▶ Supermarket prices responds little to large swings in demand brought about by labor conflicts, mass population relocation, and shopping sprees around storms and hurricanes.
- ▶ This evidence is consistent with flat short- to medium-term supply curves in the retail sector.
- ▶ Investigation of markup behavior and deviations from constant returns to scale at lower levels of the production chain seem much needed.