The Effect of Sell-by Dates on Purchase Volume and Food Waste

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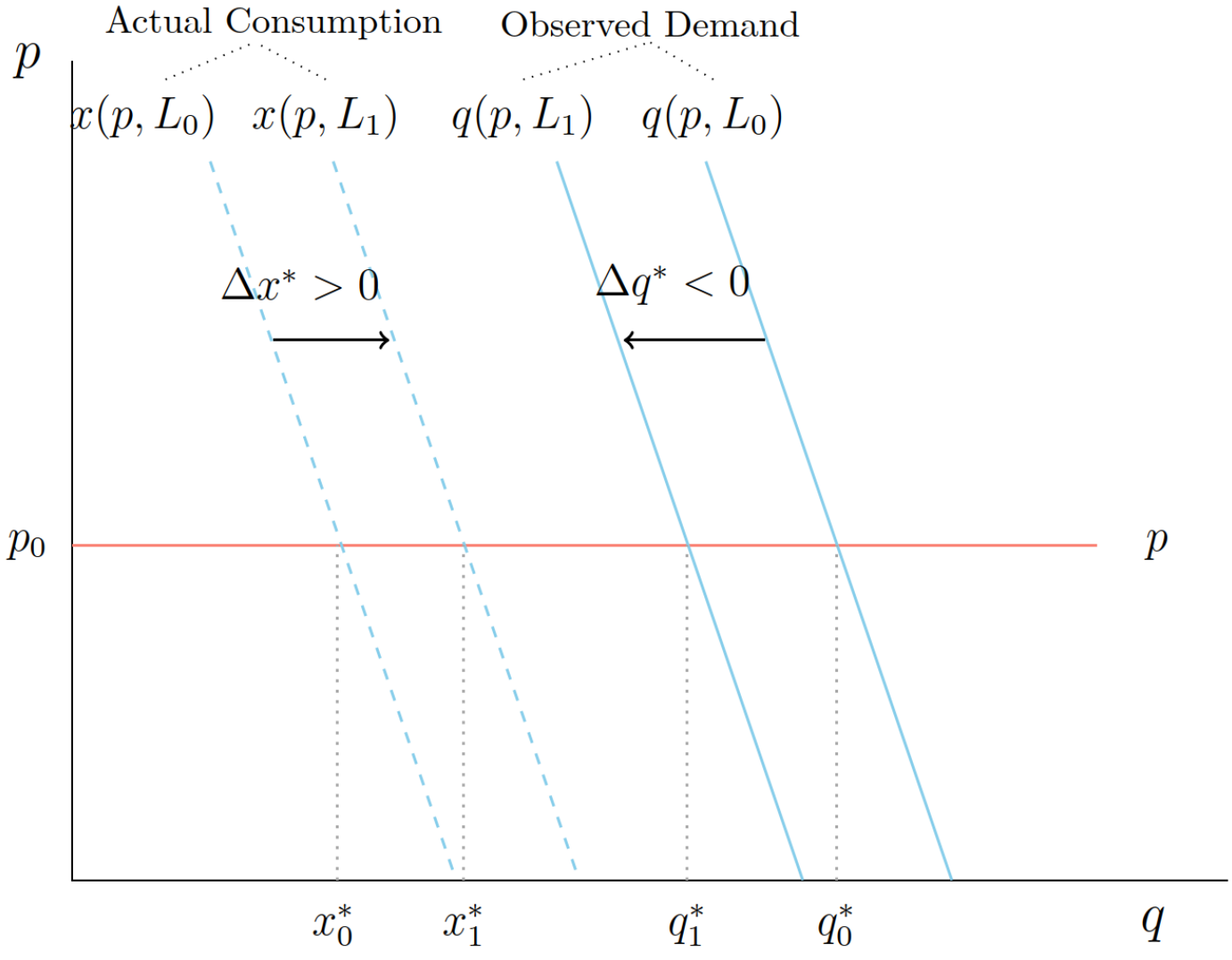
Why study sell-by dates?

1. Food Waste Reduction:
    - Play a key role in perishable food consumption.
    - **Consumers**: often misinterpret them as "food safety" labels.
    - **Regulations:** not all state regulations are up-to-date.
2. Methodologically:
    - As an **identification strategy** to estimate changes in food waste.

The theoretical model

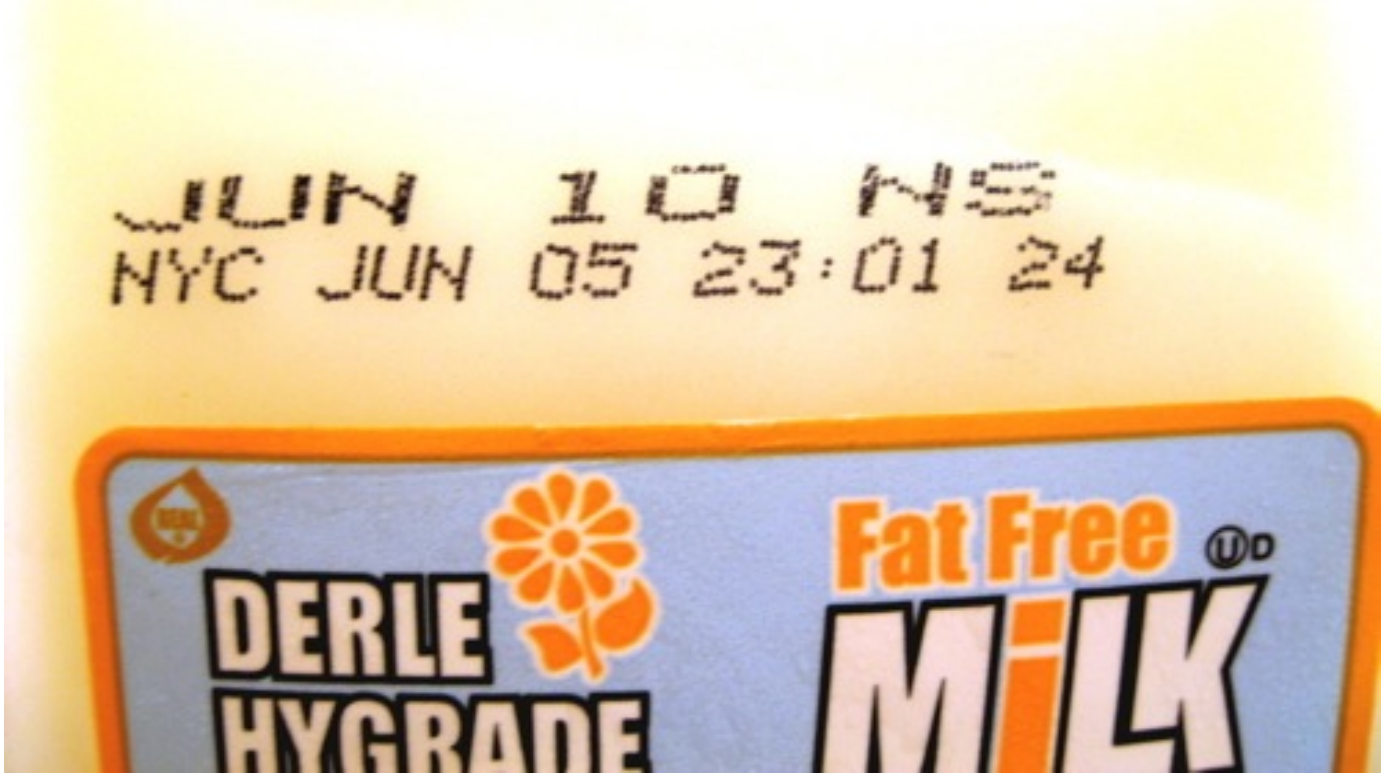
- A theoretical model of utility maximization:
  - Focuses on one perishable product.
  - Household choose how much to purchase and how much to waste.
  - It is costly to reduce food waste.
- Results:
  - If demand is price-inelastic, then a longer sell-by date reduces purchase volume and increases actual consumption.
  - Food waste is reduced more than purchase volumes.

Comparative statics



Empirical case

- Before September 2010, milk has to be sold within 9 days after pasteurization in NYC.
- In Connecticut, New Jersey, and other part of New York State, it's typically 14-15 days.



Changes in yearly sales volumes

	New York City				
Counties	No. of Stores	Before	After	Change	% Change
Kings	131	715.6	695.5	-20.17	-2.8%
New York	193	1012.4	922.0	-90.38	-8.9%
Queens	119	1551.2	1509.2	-41.98	-2.7%
Region Total	443	3279.2	3126.7	-152.54	-4.7%

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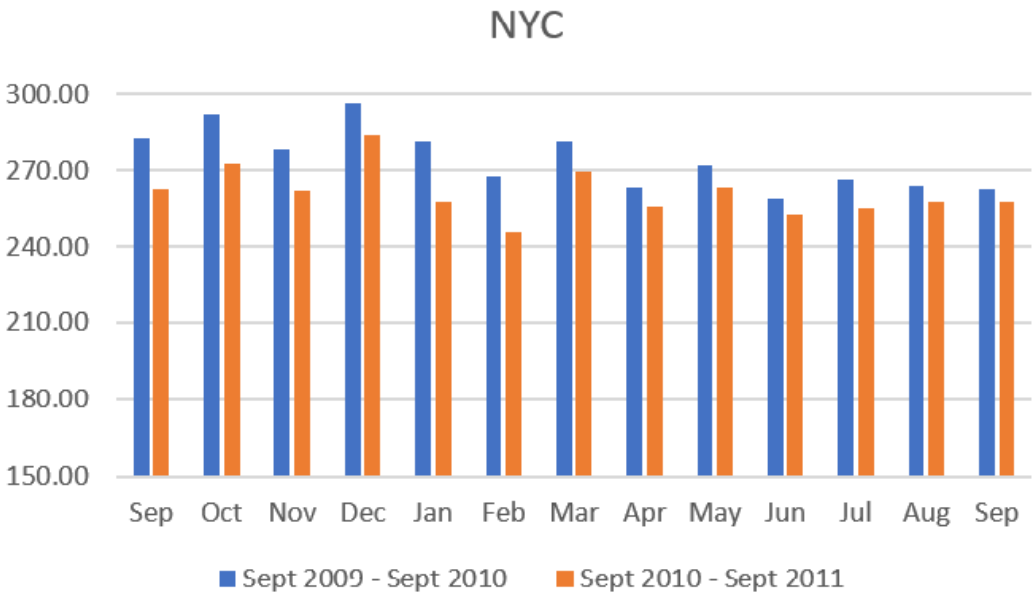
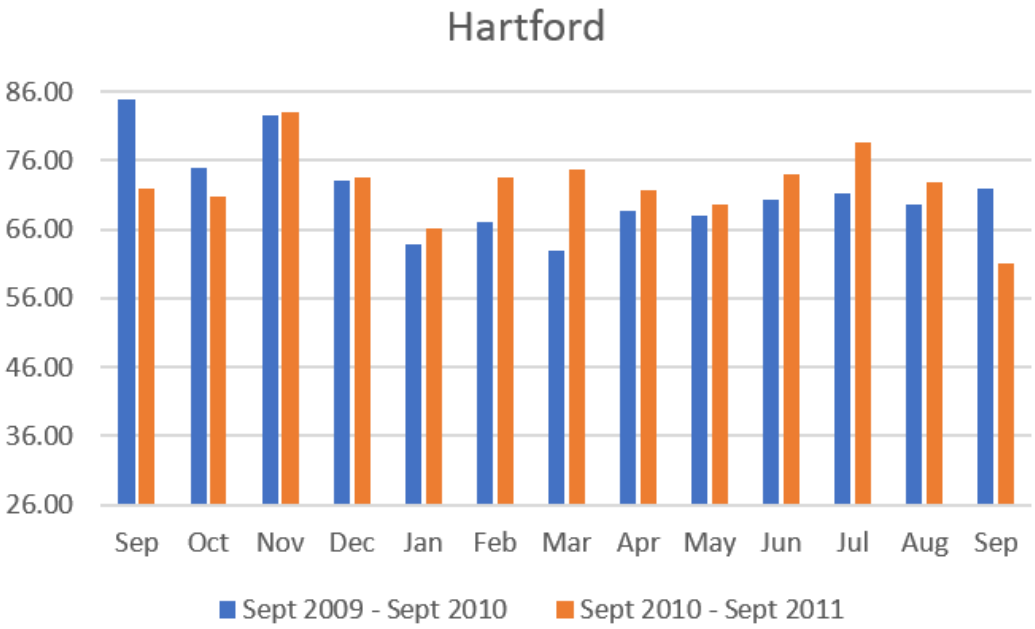
Hartford Area

Counties	No. of Stores	Before	After	Change	% Change
Hartford	72	521.9	554.4	32.50	6.2%
Middlesex	15	101.6	97.8	-3.82	-3.8%
New London	22	170.3	170.5	0.15	0.01%
Tolland	7	63.7	55.4	-8.27	-13.0%
Region Total	116	857.5	878.0	20.56	2.4%

Monthly sales volumes





Empirical estimations

We looked at:

- Sales volumes at the retail level
- Purchase volumes at the household level.
- Data source: Nielsen Retail Scanner and Consumer Panel.
- Methods: Difference-in-Difference, Synthetic Control.

We found:

1. Purchase volume decreased by about 10% (min. 9% max. 13%).
2. Price elasticity of milk demand is about 0.65.

Implications for food waste

- NYC's new policy reduces food waste by at least 10%.
- If previously 30% of milk is wasted, now it's less than 20%.
- This reduction represents 5.2 million pounds of milk $3.4 million dollars annually in NYC.
- Consumers now drink **more milk while spending less.**

Market-level implications

How does an extension in sell-by dates affect supply side?

- Loss-leading Strategy
  - Longer sell-by dates reduce the effectiveness of loss-leading strategy.
- Market Power
  - Longer sell-by dates help small retailers mitigate inventory cost.
  - Also help out-of-state milk distributors reduce transportation cost.

Takeaways from the study:

- We need to keep regulations up-to-date.
- Improve consumer education, e.g., how to interpret date labels.

Thank You!