Discussion of "Change at the Checkout: Tracing the Impact of a Process Innovation" by Emek Basker

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Discussion of Emek Basker

Change at the Checkout:

Tracing the Impact of a Process Innovation

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Key Contribution

- **How process innovations affect the retail productivity**

- **Barcode scanners → retail grocery prices decrease**

- **Mechanism: Barcodes → lower labor costs (Basker, 2012)**
  → complementary processes

  → price decrease

Data

- **Scanner installations**

- **City-level average price data (ACCRA), quarterly**

- **15 products in 5 categories**
  - **Produce, dairy, meat, canned, misc.**
  - **3 products in each category**

- **Additional category (control)**
  - **Non-grocery**
  - **3 products**

Econometrics - 1

- **Diff-in-diff**

- **Identification: differences b/n early and later adopters**

- **Heterogeneity**
    - **Product level**
    - **Regulatory – IPL (item-pricing vs shelf-pricing)**
    - **Technological - vintage**

- **Lagged Effect**

Econometrics - 2

- **Other explanations**
  - **Bias**
  - **Product/store selection**
  - **Entry by efficient competitors**
  - **Placebo tests**
  - **Robustness**

- **Welfare implication**
  - **Consumer surplus - $7.2 billion**

Mechanism

- **Barcodes $\rightarrow$ Lower labor costs $\rightarrow$ lower marginal cost**

- **Also**
  - **Cross-subsidization**
  - **IPL – item pricing no longer needed**
  - **Supplementary operation improvements**
    - **Improved data/inventory management**
    - **Better information on demand**
    - **Better pricing (caveat – too optimistic; Ralphs – upward sloping D)**

- **Main point**
  - **Lower variable costs**

That's Reasonable

- **Supermarkets: 25,000–35,000 products**

- **Item pricing – costly (Bergen, et al., 2008)**
  - **15% price changes/week (promotional and otherwise)**
  - **Supplementary improvements: data/inventory mgmt., optimal pricing**

- **The main explanation**
  - **Additional operational improvements**
  - **Lower variable costs**

Marketing Literature

- **Price adjustment decisions – three factors**

  1. **Competitive factors**

  2. **Consumer price sensitivity**

  3. **Costs**

- **Emek focuses primarily on costs**

Investments in New Technologies

- **Alternative investment avenues (capital constraints)**
  - **Invest in barcode scanners**
  - **Expand existing departments within stores**
  - **Add new departments to existing stores**
  - **Open new stores**
  - **Which one yields higher NPV?**

- **Large up-front fixed cost (NCR Example, Levy et al. 1998)**
  - **Payback time – an important determinant**
  - **2–3 years maximum**
  - **Concerns about sinking the adoption cost**

Questions Supermarkets Face

- **Evolving technology standards**

- **Technological obsolescence**
  - **Does the system really work**
  - **Vendors – will be in business (minimum 5 years)**

- **Barcodes might not work well with all products**

- **Additional costs**
  - **Software/hardware maintenance**
  - **Employee training**

Pricing Strategy

- **EDLP vs High/Low (It would be great to have the data)**

- **EDLP**
  - **Every-Day-Low-Price**
  - **Fewer price changes**
  - **Less savings from barcode scanners**

- **High/Low**
  - **High list prices – more frequent discounts**
  - **More frequent price changes (20% more in Levy, et al., 1997, Dutta, et al., 1999)**
  - **Greater Savings from barcode scanners**
  - **High/low at IPL states – even greater potential savings**

Competitive Factors

- **Some stores install the barcode**

- **Some wait**
  - **Don't see the benefit**
  - **High cost to early adopters**
  - **Not sure how well it really works**

- **Early adopters**
  - **Stores that could take advantage**
  - **Store that are more volume-driven**
  - **High cost of buying it first dampens the net benefit**

Late Adopters

- **They see competitors gain advantage**

- **They have not installed yet**

- **How will they respond? Perhaps by aggressive pricing**

- **Incentive to cut prices to retain customers**

- **Lower average prices in the market**

Consumer Factors – 1

- **See the shorter lines in the adopting supermarkets**

- **Reduced shopping time**

- **Selection – try to buy products with barcode**

- **Go to the adopting stores**

- **Further pressure on non-adopting stores**

Consumer Factors – 2

- **How people interpret new technology**

- **How they make sense of it**

- **Can be suspicious**

- **Gives supermarkets a lot of power (can change prices fast)**

- **Colleague – volunteered to bag groceries**

"Cheapest Prices"

- **ACCRA Data**
  - **The "cheapest" prices**
  - **Likely varies from period to period**
  - **Only 2 brand names: Baby Food (Gerber) and Shortening (Crisco)**
  - **The rest: non-brand or private label perhaps**
  - **Quality constancy over time**

FCOJ – Best Price

Frozen OJ Reference, List, Price Paid, and "Best" Price
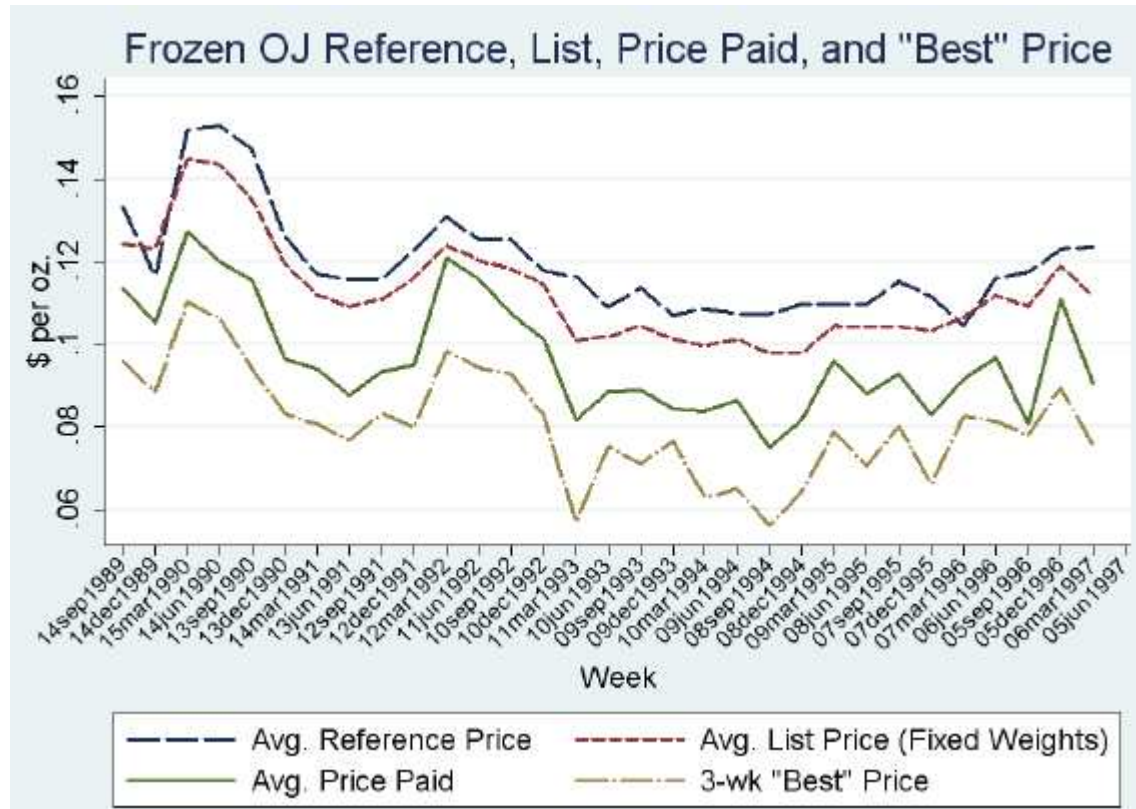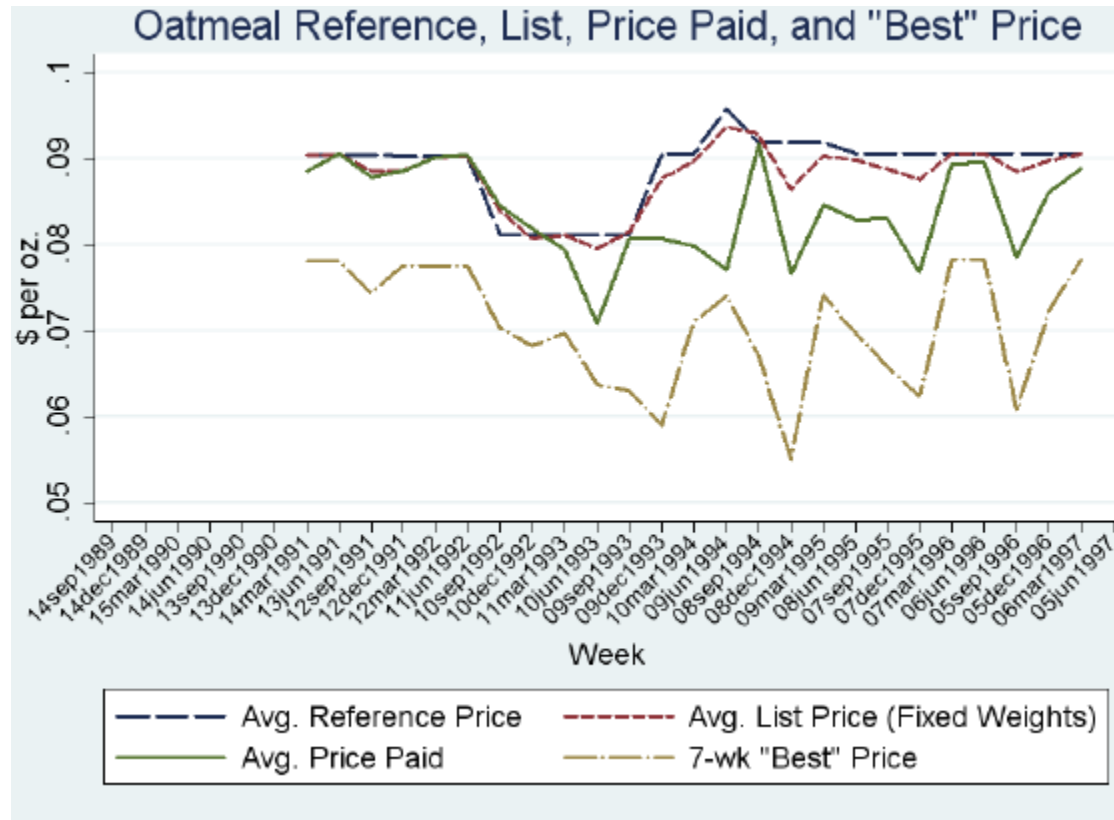
Source: Chevalier and Kashyap (2011)

FCOJ – Heritage House
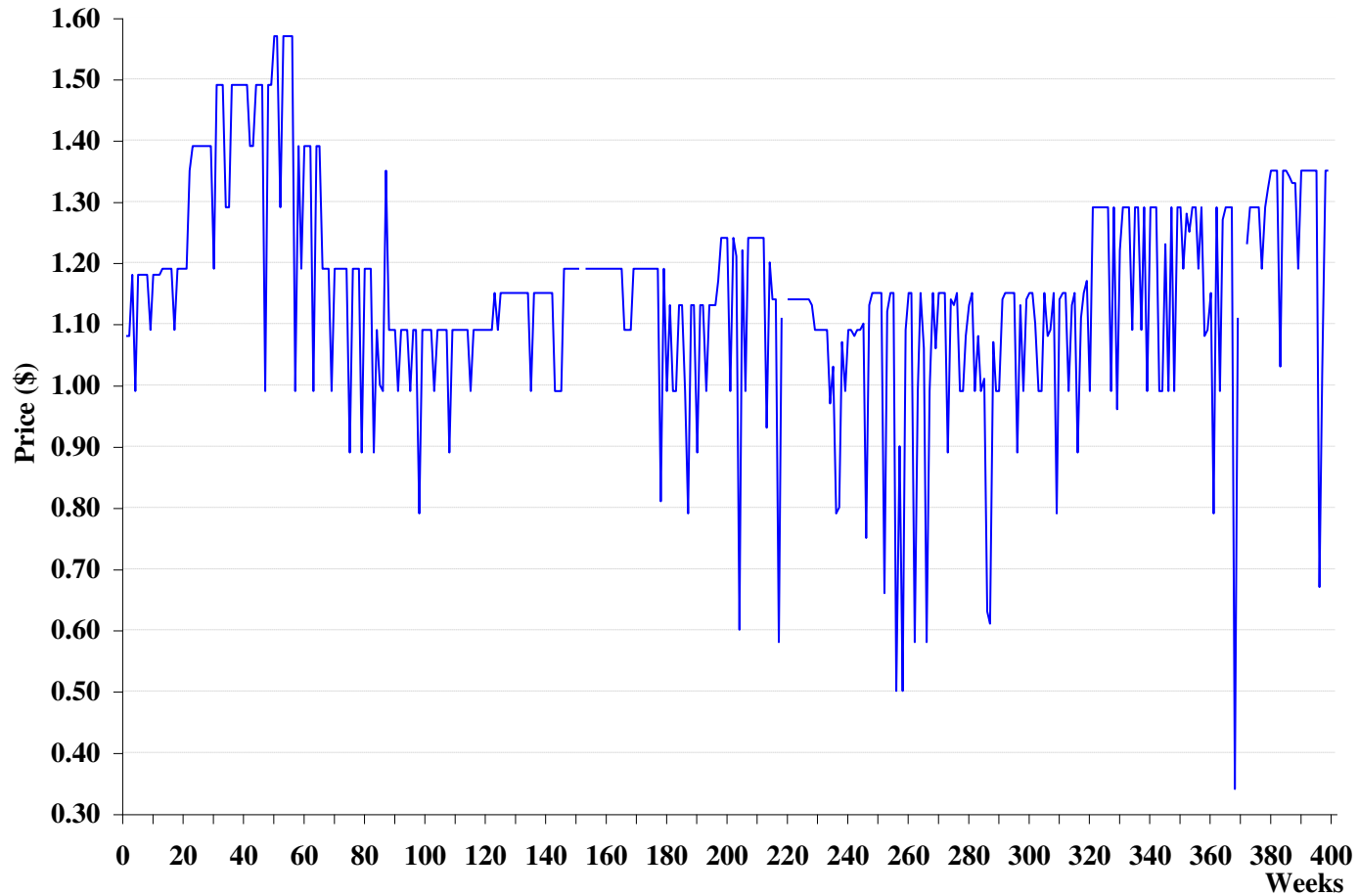
Source: Levy, et al. (2002), Dutta, et al. (2002)

Oatmeal

Source: Chevalier and Kashyap (2011)

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Perhaps Greater Welfare Gain

- **Additional benefits to Consumers**
  - **Saving in shopping time**
  - **More pleasant experience – faster checkout**
  - **Detailed receipt – ability to compare prices**
  - **Fewer errors**
  - **Measurement – perhaps**
  - **The actual welfare gain is probably greater**

Minor Technical Points

- **Interpolation (I used to be an econometrician)**
  - **In time series**
  - **Introduces persistence and periodicity in the data (Dezhbakhsh and Levy, 1994)**
  - **What is the effect in panel?**

- **Data collection - ACCRA**
  - **Need to be more suspicious**
  - **For what products is it easier to collect the price data**
  - **At what stores (with or without scanners) is it easier to collect data**
  - **Are the people who collect data affected by this?**
  - **What I learned at CBS**

Summary

This is a great paper.

I enjoyed reading it a lot.

It has rekindled my interest in these issues.

Thank you!

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