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 → Lower labor costs → 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

Source: Chevalier and Kashyap (2011)
FCOJ – Heritage House

Oatmeal

Source: Chevalier and Kashyap (2011)
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!
References


