Item Pricing Laws and their Possible Effects on Prices: Research Findings

Daniel Levy, Ph.D.
Bar-Ilan University and Emory University

Sourav Ray, Ph.D.
McMaster University

Prepared for Presentation at the Hearing on Price Modernization Act
Michigan House Committee on Commerce

June 21, 2005
Introducing the Faculty

• Daniel Levy, Bar-Ilan University, Israel and Emory University, USA
  – Ph.D. in Economics, University of California – Irvine
  – Emory University, Economics Department, 14+ years
  – Director of the Aaron-Meyer Center for Banking Research
  – Academic Head of the Israeli Government’s Committee on Item Pricing Law

• Sourav Ray, McMaster University, Canada
  – Ph.D. in Business Administration, University of Minnesota
  – Concordia University in Canada, 4+ years

• Between us:
  – Over 30 years experience Teaching and Researching in Pricing
  – Done research on the economic impact of item pricing laws
Background Study: Costs of Changing Prices

- Direct measurement of costs of changing prices
  - Detailed field studies, 5 major US retail chains, one of them subject to IPL
- Findings for IPL stores:
  - Roughly 2.5 times more costly to change a price
  - Prices changed roughly 2.5 times less frequently

<table>
<thead>
<tr>
<th></th>
<th>Cost of a Price Change per Price Change</th>
<th>No. of Price Changes per Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPL</td>
<td>$1.33</td>
<td>1,578</td>
</tr>
<tr>
<td>No-IPL</td>
<td>$0.52</td>
<td>3,916</td>
</tr>
</tbody>
</table>

We found that Item Pricing Laws

- Increased retailers costs

- Affected their pricing decisions
Research Questions for the IPL Study

- What are the effects of IPLs on consumer prices?
- How to measure these effects?
- Could we assess the economic efficiency of IPLs?

This led us to design and implement an IPL study.
Research Design

- 3 types of stores: (1) IPL, (2) non-IPL, and (3) ESL
- Tri-State: Connecticut, New Jersey and New York
- Natural experiment
- Geographical proximity
- Demographically and socio-economically, very similar
- Same/similar supermarket chain/s
- EDLP stores
- Brand name products
- Prices collected manually
Chart 1: The Tri-State Area of New York, New Jersey and Connecticut

Note: Clifton, New Jersey, is in the bottom left, Tarrytown, New York, is in the top middle, and Greenwich, Connecticut, in the top right. (Scale 1 inch=13.5 KM)
<table>
<thead>
<tr>
<th>Stores Sampled</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IPL</strong></td>
<td><strong>NO-IPL</strong></td>
</tr>
<tr>
<td><strong>NEW YORK:</strong></td>
<td><strong>NEW JERSEY:</strong></td>
</tr>
<tr>
<td>S2. C Town, Ossining, NY</td>
<td>S12. Shop Rite, Rochelle Park., NJ</td>
</tr>
<tr>
<td>S6. Path Mark, Yonkers, NY</td>
<td></td>
</tr>
<tr>
<td>S7. Food Emporium, Hastings, NY</td>
<td></td>
</tr>
<tr>
<td>S8. Shop Rite, Monsey, NY</td>
<td></td>
</tr>
<tr>
<td>S9. Food Emporium, NYC, NY</td>
<td></td>
</tr>
<tr>
<td>S10. Food Emporium, Armonk, NY</td>
<td></td>
</tr>
<tr>
<td><strong>CONNECTICUT:</strong></td>
<td><strong>CONNECTICUT:</strong></td>
</tr>
<tr>
<td>S16. Food Emporium, Greenwich, CT</td>
<td>S18. Stop &amp; Shop, Greenwich, CT</td>
</tr>
<tr>
<td>S17. Shaws, New Canaan, CT</td>
<td>S19. Stop &amp; Shop, Stamford, CT</td>
</tr>
<tr>
<td><strong>ESL</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S20. Shop Rite, Norwalk, CT</td>
</tr>
</tbody>
</table>
Data Collected

 Dataset 1
- 4 stores (2 IPL, 1 no-IPL, 1 ESL)
- 11 categories, 15 products in each category
- 4 trips at one-month intervals (January–April, 2001)
- 2,640 price observations (660 from ESL stores)

 Dataset 2
- 20 stores (12 IPL, 5 no-IPL, 3 ESL)
- 2 categories, 15 products in each category
- 1 trip
- 600 price observations (90 from ESL stores)
Table 1.2: Categories and Products Included in Data Set I
Findings, IPL versus No-IPL

- Prices are consistently higher at stores subject to the IPL

- IPL store prices > non-IPL store prices,
  - overall (T1.3, T2.3)
  - by category (T1.3, F1.1, T2.3, F2.1)

- Within-Chain: IPL store prices > non-IPL store prices,
  - by category, (T2.4, F2.2), (T1.4, F1.2)

- Average price difference = $0.25 per item
Findings, ESL versus IPL

- Prices are consistently lower at the ESL stores

- ESL store prices < IPL store prices, overall (T5.1, T6.1)

- ESL store prices < IPL store prices, by category (T5.1, F5.1)

- Within-state: ESL store prices < IPL store prices, overall
  Control for a possible cross-state variation (T5.2, F6.2)

- Average price difference = $0.15 per item
Summary:
Average Price Differences

$0.25$

$0.15$
$0.10$

IPL $>$ ESL $>$ no-IPL

$0.25$
How big is $0.25?

- Average price $2.71 (Dataset I) and $2.50 (Dataset II)
- Price difference ($0.25): 9.2%–10%
- Average consumer spends approximately 14% on groceries
- Real income decreases by 1.4%
Quantifiable Benefits of IPLs: Pricing Accuracy

  - 5%–10% of products overcharged
  - Average overcharge $0.20–$0.70 per item

- FTC Studies: Two Studies
  - **Price Check I (1996):**
    - 294 Stores
    - 17,928 items
    - Only 4.28% error rate
  - **Price Check II (1998):**
    - 1,033 Stores
    - 107,096 items
    - Only 3.33% error rate
Costs versus Quantified Benefits

**IPL benefits:**

- Percent of products overcharged: 5%–10%
- Average overcharge per item: $0.20–$0.70
- Maximum benefit: $7 per 100 items

**IPL costs:**

- Higher prices paid (≈ $0.25 per item)
- Cost is of the order of $25 per 100 items

Costs = Three times the benefits, $25 versus $7
Possible Biases and Other Shortcomings

- **Variation** across states/localities in wage rate, tax rate, household income, wholesale prices, etc.

- **Unmeasured costs**: monitoring, prosecution, audit, price check survey (hard to measure)

- **Unmeasured benefits**: comparison shopping, slows down price increases, misplaced items, difficult to read labels (even harder to measure)
Implications for Michigan

- IPLs clearly impose costs on retailers
- IPLs may be inefficient
- Most likely: the Michigan consumers are paying the cost
Thank You!
Findings: Product Level Comparison
IPL versus Non-IPL

- IPL store prices > non-IPL store prices
  - for 148 of the 165 of the individual products (F1.3)
  - i.e., 90% of the individual products in data set 1
  - for all 30 individual products (F2.3)
  - i.e., 100% of the individual products in data set 2
Costs vs. Benefits

**IPL benefits:**

- Percent of products overcharged: 1.36%
- Average overcharge per item: $0.66
- Maximum benefit: $0.90 per 100 items

**IPL costs:**

- Higher prices paid (≈ $0.25 per item)
- Cost is of the order of $25 per 100 items

Costs = 27+ times the Benefits, $25 versus $0.90
Findings, ESL versus IPL: Data Set II

- ESL store prices < IPL store prices, overall (T6.1)
- ESL store prices < IPL store prices, by category (T6.1, F6.1)
- Within-state: ESL store prices < IPL store prices, overall and by category, control for a possible cross-state variation (T6.2, F6.2)
- Within-state and locality: ESL store prices < IPL store prices, overall and by category, control for a possible cross-state and cross-locality variation (T6.2, F6.3)
- Within-state and locality (+intersection): ESL store prices < IPL store prices, overall and by category, control for a possible cross state and (even finer) cross locality variation (T6.2, F6.4)
- Average difference = $0.16 per item
Findings, ESL versus No-IPL: Data Set I

- Prices are consistently higher at the ESL stores
- **Stop & Shop**: ESL store prices > non-IPL store prices, overall (T3.1)
- **Stop & Shop**: ESL store prices > non-IPL store prices, by category
  - Control for a possible cross-chain variation (T3.1, F3.1)
- Average price difference = $0.10 per item
The Effect of IPLs on Retail Prices

- IPLs increase retailers’ variable costs

- **IPLs increase retailers operating costs**
  (Price sticker on every item)

- **IPLs increase retailers price adjustment costs**
  (i.e., price adjustment cost increases with the number of units sold. Menu costs, in contrast, are a fixed cost.)

  **Example:** Time and motion measurements

- IPLs will lead to higher retail prices (even under competition)
Electronic Shelf Label Systems

- Two supermarkets with ESL systems (exempted from IPL)

- **Fixed cost:**
  Purchase cost, installation cost, training cost, conversation downtime cost

- **Variable costs**
  Continuous maintenance, ongoing battery replacement, periodic software upgrade, periodic hardware upgrade, replace lost labels (break, tempering)

- **Our Prediction:**
  ESL store prices > No-IPL store prices
  ESL store prices < IPL store prices
Are these Unmeasured Benefits Important? Perhaps Not!

- Many search consumers mostly look at sales/weekend promotion prices which are exempted from IPL.
- Unit Price Law is more useful for search consumers. UPL will make weighing out harder.
- Shelf Price Law and Unit Price Law, together, offer the consumers most of the benefits at zero marginal cost.
- Sellers have powerful incentive not to overcharge: lawsuits & persecution —> mistrust & reputation damage.
- Recent developments: Rational Inattention.