Consumers' Activism: the Facebook boycott of Cottage Cheese

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Introduction

☐ Social media seem to play important role facilitating political mobilization:
  ■ Protests in Bulgaria, Turkey, Brazil, Iran and Bosnia
  ■ Uprisings in Egypt and Tunisia in 2011

☐ Some commentators (Taylor, CNN 2011, and Mainwaring, Forbes 2011) argued social media may enable consumer mobilization:
  ■ Disciplining firms: to lower prices or act socially responsible
  ■ Buyers’ countervailing power
  ■ Bank of America, SunTrust and Wells Fargo, debit fees 2011

☐ Boycotts
  ■ Numerous objectives: environmental, political, animal rights
  ■ Proxy vs. non-proxy boycotts
  ■ We look at a non-proxy, with direct economic goal (lower prices)
The cottage boycott

- Cottage cheese is a staple food in Israel
- Price was under government price control until July 2006
- By May 2011, price increased 43% (since deregulation)
- On June 14, 2011, a Facebook event created, calling for a boycott of cottage cheese starting July 1 until price drops from about 7 NIS (per 250 grams container) to 5 NIS (1 U$S=3.88NIS then)
  - Trigger: event follows press coverage of items produced in Israel sold cheaper in the US
- Immediate impact on prices
- We look at
  - the evolution of prices and quantities, who/when reacted
  - assess impact on demand
  - role of social media
The cottage boycott

- What we study:
  - How the boycott worked
    - Consumer behavior
    - Firms’ reactions
  - Why it worked
    - Channels, how costly to firms, fear of spread to other products
  - What was the role of social networks

- Social media seems crucial for boycott
  - There was no organized interest group behind the protest
  - Requires creating outrage (prices abroad)
The cottage boycott

- We estimate demand to
  - Compute counterfactual sales during the boycott
  - Demand at start of boycott declined 30% (short lived)

- Lasting impact: higher demand elasticities

- Implications:
  - Antitrust
  - Firm strategy (this is not a “proxy boycott”)
  - Political Economy of Boycotts (Diermeier, 2011, 2012)
Related Literature

- **Economics:**
  - Hong et al. (2011) French cars in China
  - Clerides, Davis, and Michis (2013): US soft drinks in Arab countries during the Iraq war
  - Fershtman and Gandal (1998) cars (sellers) in Israel
  - Barrage, Chyn, and Hastings (2014) Impact of green advertising on BP
    - Non-Proxy
    - Only non-proxy boycotts have implications on firm strategy

- **Finance:**

- **Political Economy of Boycotts**
  - Diermeier (2011, 2012)

- **Effect of the Internet on political outcomes**
Background
Cottage cheese

- Variety of cottage, but 80% of sales are plain 5% in 250 grams container

- Market shares at the end of 2013
  - Tnuva: 71.9%
  - Tara: 14.5%
  - Strauss: 12.9%

- All three are food conglomerates
The evolution of cottage price

43% increase

Vertical line marks price cap removal on July 30, 2006
The boycott events

- May 31, 2011: news articles describe surge of food prices in Israel
  - Until today foreign comparison attract attention on-line and on tv

- June 14: the Facebook event created:
  - 30K join on June 14
  - 70K by June 16
  - 105K by June 30

- June 14: Hard discount chains announce special deals for a few days
  - loss leader?

- June 16: the organizers announce that the boycott starts immediately

- June 24: Tnuva's board chair announces on TV interview that Tnuva will not unilaterally lower prices. Following interview, three new groups form on Facebook calling to boycott all Tnuva products

- End of June: Tnuva lowers wholesale price to 4.55 NIS, and soon after, Strauss and Tara followed.
  - Price Reduction does not meet the boycotters’ demands
The boycott events

- June 27: Government appoints committee to review competition and prices in food and consumption markets

- Mid July: Committee recommends reforms in dairy market

- July: "tents protest" organized on Facebook; thousands of protestors set up tents in Tel Aviv to protest rising cost of living and demanding social justice

- September: The student associations of 12 colleges and universities announce their intention to boycott Tnuva until lowers prices

- September 25: The antitrust authority raids Tnuva's offices
  - Seizes 2008 McKinsey report advising Tnuva to raise prices by at least 15% since demand for cheese is inelastic

- October 2: Chairmain resigns from Tnuva's board
  - Tnuva announced a price cut of up to 15% of dozens of products
Data
Data

- Scanner (register) data covering virtually all large supermarkets and many minimarkets and groceries

- Daily transactions of the cottage and white cheese in 2,169 stores throughout the country, over the period January 1, 2010 - April 30, 2012

- We restrict attention to most popular configurations: 250 grams, plain cottage and white cheese, with 3% and 5% fat content

- We thus have 6 items (cottage cheese and white cheese by three manufacturers) sold in 2,135 stores
The distribution of stores

<table>
<thead>
<tr>
<th>Store format</th>
<th>Frequency</th>
<th>Percent</th>
<th>Percent of sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convenience Stores</td>
<td>54</td>
<td>5</td>
<td>0.3</td>
</tr>
<tr>
<td>Grocery stores</td>
<td>84</td>
<td>7</td>
<td>0.8</td>
</tr>
<tr>
<td>Minimarkets</td>
<td>320</td>
<td>28</td>
<td>8.9</td>
</tr>
<tr>
<td>Main local supermarkets</td>
<td>290</td>
<td>26</td>
<td>28.6</td>
</tr>
<tr>
<td>Main HD supermarkets</td>
<td>227</td>
<td>20</td>
<td>36.6</td>
</tr>
<tr>
<td>Other HD supermarkets</td>
<td>152</td>
<td>13</td>
<td>24.9</td>
</tr>
<tr>
<td>Total</td>
<td>1,127</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
Anatomy of the boycott
Price reaction to the boycott

24% drop

Vertical line indicates June 15
Quantity-weighted mean prices across stores
Price reaction to the boycott

- Immediate price concession
  - Lower than demanded by boycotters
  - Lasting impact, even today the price is below 6 NIS

- Similar prices across brands before, similar prices after
- Despite different shares, and elasticities (as we see later)

- Still enough variation over time (which does not appear seasonal or brand related) to enable demand estimation

- Lets look closer at evolution of prices:
  - by format, and variance over time
  - for hints of what happened
Distribution of prices

Vertical line indicates June 15
Prices by store format

vertical line indicates June 15
quantity-weighted mean prices across stores and brands
S.D. of prices

Vertical line indicates June 15, 2011
Who initiated the price cuts?

- The swift price decline is probably due to retailers rather than manufacturers:
  - Steep increase in price dispersion after the boycott
  - Similar price declines across brands within a store

- Large chains offered temporary sales in light of the attention garnered by the product category
  - Sort of loss-leader

- Tnuva, largest manufacturer, publicly announced no price concessions
Consumers’ reaction to the boycott

- How can the boycott harm firms:
  - immediate loss of sales (including other products)
  - risk government decides to re-regulate prices
  - risk of other government intervention: opening for imports
  - risk of class action on grounds that prices are excessive (relevant for Tnuva which was declared monopoly in "milk and milk products" market by Antitrust Authority in 1989)

- We focus on the immediate loss of revenue, we cannot quantify the other risks
Weekly total quantity

Prices fell by 24%

Vertical line indicates June 15, 2011
Quantity relative to May 15, 2011

Quantity drops by 20% on the 1st and 2nd weeks

Quantities relative to week starting May 15, 2011
Vertical line indicates June 15, 2011
Tel Aviv vs. the rest of the country

Quantities relative to week starting May 15, 2011
Vertical line indicates June 15, 2011

15% drop
Boycott impact-on-demand

- We observe a decline in quantity sold (small and non-lasting) which confounds the response to price reduction

- How large was the boycott effect demand?

- “But for” boycott calculation
  - Estimate pre-boycott demand
  - Plug boycott prices, to get “but for” predicted sales
  - Compute a boycott intensity index (BI): ratio of observed sales over the counterfactual quantity
The boycott effect

- $q_1$ is 6% below $q_0$ (effect in week 1)
- $q_1$ is 30% below $\hat{q}(p_1)$
Boycott impact-on-demand

- We estimate the following demand function:

\[
\ln(q_{jst}) = \alpha_{sj} - \beta_j \ln(p_{jt}) + \sum_k \gamma_{jk} \ln(p_{kt}) + x_t \delta + \varepsilon_{jst}, \quad j = 1, \ldots, 6, \quad k \neq j
\]

- Using the pre-boycott estimates, to compute:

\[
BI(p_t) = 100 \times \left( \frac{q_t}{\hat{q}_0(p_t)} - 1 \right)
\]

- \(BI(p_{-t})\) is gap between observed and predicted sales
  - For example \(BI(t)=0.9\) means sales are 10% below expectations due to the boycott
What did the boycott do?

- Impact on demand, only temporary
  - Reputation effects did not last

- Did it have other lasting effects (beyond the temporary demand reduction)?
  - For example increasing awareness about prices, product substitutes, perhaps leading to more intense search

- We estimate demand post boycott (leaving the boycott period out of the sample)
  - We then compare demand before and after
### Price elasticities before and after

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>before</td>
<td>-1.56***</td>
<td>0.51 ***</td>
<td>0.14</td>
</tr>
<tr>
<td>after</td>
<td>-1.69 ***</td>
<td>2.05 ***</td>
<td>1.77 ***</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>before</td>
<td>0.11 ***</td>
<td>-3.63 ***</td>
<td>0.11 **</td>
</tr>
<tr>
<td>after</td>
<td>0.69 ***</td>
<td>-4.70 ***</td>
<td>0.60 ***</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>before</td>
<td>0.03</td>
<td>0.24 ***</td>
<td>-4.3 ***</td>
</tr>
<tr>
<td>after</td>
<td>0.47 ***</td>
<td>0.81 ***</td>
<td>-5.07 ***</td>
</tr>
<tr>
<td>Obs.</td>
<td>431,954</td>
<td>431,954</td>
<td>431,954</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.88</td>
<td>0.74</td>
<td>0.72</td>
</tr>
</tbody>
</table>

- **Before = before May 15, 2011**
- **After = after October 2, 2011**
- The post-boycott elasticities are higher, especially cross elasticities (5 times higher on average)
- The before-after differences are sig. except in the case of A’s own price elasticity
- We tried substitution to white cheese (closest product), nothing systematic
Social networks
Social media

- Unlike other consumer boycotts, the cottage boycott did not have organized backing ⇒ Social media was essential for:
  - coordinating action
  - getting the message across
  - alleviating the commons problem (no point in joining unless many others join to make the boycott effective)

- We use demographic data from the 2008 Israel Census of Population conducted by the Central Bureau of Statistics

- The data corresponds to each store statistical area store (small, homogenous, geographical area with population between 2,000 and 5,000)

- Demographics likely correlated with access to social media
Who participated?

- The average BI index for stores, June 15-August 31:
  \[ BI_s = \frac{1}{T} \sum 100 \times \left( \frac{q_t}{\hat{q}_0(p_t)} - 1 \right) \]

- Regressing BI_s on each demographic variable:

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>BI_s</th>
<th>Obs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households with PC</td>
<td>-0.3623***</td>
<td>882</td>
</tr>
<tr>
<td>Households with Internet</td>
<td>-0.3596***</td>
<td>882</td>
</tr>
<tr>
<td>B.A. degree</td>
<td>-0.6575***</td>
<td>838</td>
</tr>
<tr>
<td>Mobile phones per household</td>
<td>-7.9951***</td>
<td>882</td>
</tr>
<tr>
<td>% in &quot;yeshiva&quot; (relig. school)</td>
<td>0.1953***</td>
<td>817</td>
</tr>
<tr>
<td>% of those aged 65+</td>
<td>-0.0067</td>
<td>886</td>
</tr>
</tbody>
</table>

- BI_s more negative for more exposure to social media
## Who was influenced?

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<td>Own-price elasticity A</td>
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</tr>
<tr>
<td></td>
<td>Before boycott</td>
<td>After boycott</td>
</tr>
<tr>
<td>Below median</td>
<td>−1.855***</td>
<td>−1.923***</td>
</tr>
<tr>
<td>Above median</td>
<td>−1.174***</td>
<td>−1.376***</td>
</tr>
<tr>
<td>Above - Below</td>
<td>0.681***</td>
<td>0.547</td>
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<td></td>
<td>Own-price elasticity B</td>
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<td>Below median</td>
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<td>Above median</td>
<td>−3.453***</td>
<td>−4.784***</td>
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<tr>
<td>Above - Below</td>
<td>1.433***</td>
<td>0.559***</td>
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Standard errors clustered at the store level. *p<0.10; ** p<0.05; *** p<0.01
Above – below effect

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<td>Above - Below</td>
<td><strong>0.681</strong>*</td>
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|                                    | Own-price elasticity B | Own-price elasticity B |
|                                    | Before boycott | After boycott | After - Before | Before boycott | After boycott | After - Before |
| Below median                       | −4.067***     | −5.128***     | −1.061***      | −4.129***     | −5.047***     | −0.918***      |
| Above median                       | −3.144***     | −4.246***     | −1.102***      | −3.112        | −4.445***     | −1.333***      |
| Above - Below                      | **0.923***    | **0.882***    | −0.041         | **1.017***    | **0.602***    | −**0.415**     |

|                                    | Own-price elasticity C | Own-price elasticity C |
|                                    | Before boycott | After boycott | After - Before | Before boycott | After boycott | After - Before |
| Below median                       | −4.886***     | −5.343***     | −0.457**       | −4.887***     | −5.419***     | −0.532**       |
| Above median                       | −3.453***     | −4.784***     | −1.331***      | −3.503        | −4.812***     | −1.309***      |
| Above - Below                      | **1.433***    | **0.559***    | −0.874***      | **1.384***    | **0.607***    | −**0.777***    |

Standard errors clustered at the store level. *p<0.10; ** p<0.05; *** p<0.01
Before – after effect

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Firm’s Incentives
Did firms fear spillovers?

Prices decrease only after boycotters demand price reductions in white cheese.
Decomposing the price decline

- Why did prices decline following the boycott?
  - Higher elasticities, perhaps due to increased price awareness
  - Firms' fear of consumer’s reactions, intervention by policymakers, or class actions

- FOCs imply that $p = \eta/(\eta-1) \times c \Rightarrow c = (\eta-1)p/\eta$

- If cost did not change, then post boycott price should be
  $$p' = \frac{\eta'}{\eta'-1} \times c = \frac{\eta'}{\eta'-1} \times \frac{(\eta-1)p}{\eta}$$

- Using estimates, before and after, we find brand B’s price should have dropped by only 8% and C’s by 5%, due to elasticity changes
  - A’s own price elasticity did not change much
  - B and C also seem to have reacted to other considerations
Epilogue

- Price of cottage cheese remains below 7NIS until today
- Tnuva’s Chief Marketing Officer on January 2013: "The cottage cheese crisis taught us a lesson of modesty and humility"
- Tnuva's CEO on July 2013: “The cottage protests caused Tnuva to emphasize the opinion of the consumer and his needs. Part of this policy is putting cottage under self-regulation”
- On August 25, 2013, the ministry of announced intention to re-regulate white cheese due to “exceptional profitability.” But found no need to re-regulate price of cottage cheese because it did not find “unreasonable profitability as in the past.”
- ...however ministry will continue to monitor profitability and possibly re-regulation if profitability becomes "unreasonable"
Conclusions

- Firms reacted swiftly but no further concessions
- Boycott led to higher demand elasticities, especially cross price elasticities (on average increased fivefold)
- Prices dropped more than focs/elasticities predict
- Estimates raise question about use of FOC for pricing
  - Long term consequences not incorporated into focs (as consultants didn’t consider)
  - Analysis may miss the mark if firms do consider LT effects
- Social media proxies associated with larger demand decline and increases in demand elasticities
- Self Regulation due to consumer activism?