Institute for
Fiscal Studies

Store brand penetration: the role of advertising

Rachel Griffith, Michal Krol and Kate Smith

Institute for Fiscal Studies and University of Manchester

March 2014

- Interest in the product offering of retailers:
  - what determines retailers' advertising and pricing decisions over store brands?

Institute for Fiscal Studies

- Interest in the product offering of retailers:

  - what determines retailers' advertising and pricing decisions over store brands?
  - regulators have expressed concern about the impact of store brand products on competition

- Why do retailers introduce store brand products?

  - IO literature: store brands can increase retailer bargaining power in negotiations with manufacturers
  - Marketing literature: allows retailers to price discriminate

Institute for
Fiscal Studies

Contribution

- Model retailers' and manufacturers' pricing and advertising decisions over store and national brands:
  - much of literature assumes that national brands are heavily advertised; but we allow for advertising of store brands

- We endogenise the advertising decisions of retailers and manufacturers:
  - incentives depend on how advertising affects demand
  - show that under certain circumstances, retailers may want to advertise their store brands more than than national brand manufacturers

- Develop a number of predictions to take to data

Institute for
Fiscal Studies

Summary of model

- Hotelling framework in which we assume there is one store brand and one national brand
- Key parameters are how advertising affects demand:
    - **Rivalrous effect**: makes advertised product more attractive relative to the other product
    - **Expansionary effect**: makes both products more attractive, regardless of which product is advertised
- Assume that in the absence of advertising, SB and NB are equally attractive

Institute for
Fiscal Studies

Descriptives

- Data from Kantar Worldpanel: records all grocery purchases (food, drink, toiletries, household products etc.) for a representative panel of British households
- Stylized facts:
  - market share of store brands stable over time
  - big variation by product category
  - and by retailer type

Institute for
Fiscal Studies

Stable across time
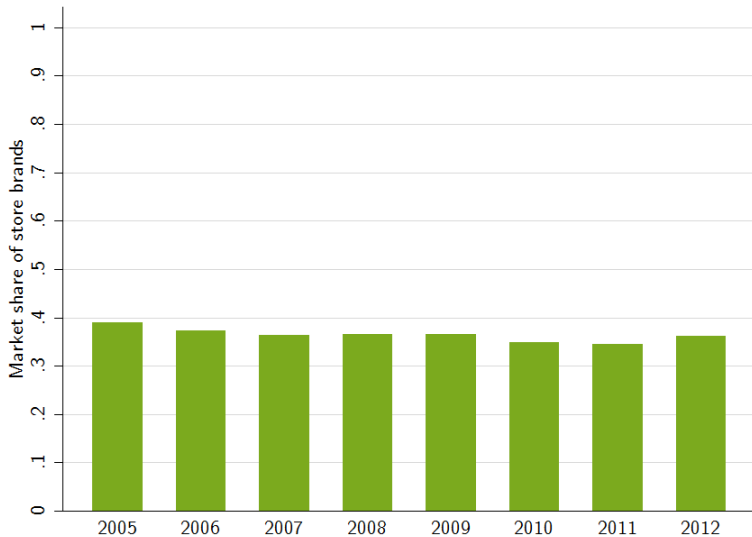
Differences across product category

Setup
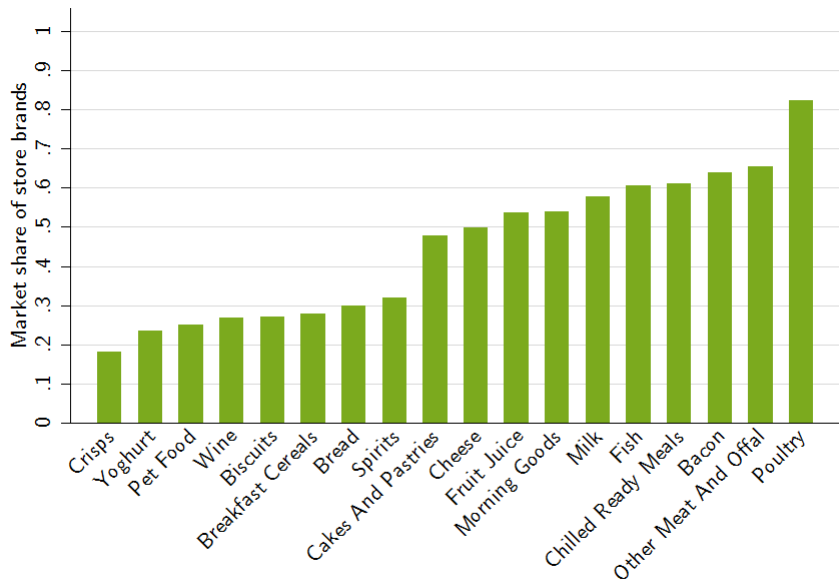
- Two varieties of a good positioned at opposite ends of Hotelling line:
  - $i = 1$ is the **store brand** (SB)
  - $i = 2$ is the **national brand** (NB)

- Produced at constant marginal cost, c

- Three players; choices:
  - Retailer chooses advertising of store brand
  - NB manufacturer chooses advertising of national brand
  - Manufactures choose wholesale prices
  - Retailer sets retail prices of both

- Assume that the retailer is a local monopolist

- Assume market covered and some of both goods is bought

Timing

- Three stage game:
    1. NB manufacturer and retailer simultaneously set advertising levels, (a_1, a_2)
    2. NB and SB manufacturers simultaneously set wholesale prices, p_i^w, $i \in \{1, 2\}$
    3. Retailer sets retail prices, p_i^r, $i \in \{1, 2\}$

- Timing of moves is common in the literature and reflects the fact that brand image is built over a long period and cannot easily be adjusted to retail pricing decisions
    - advertising of store brand is less common

Consumer utility and advertising

- Utility of a consumer, with taste characteristic, x (distributed uniformly on unit interval) of buying a unit of variety i is given by:

$$U_i(x) = V_i - p_i^r - \tau|x - (i-1)|$$

where

$$V_i = \nu + \rho a_i + \xi(a_i + a_{-i})$$

- Parameters:
    - τ is perceived product differences parameter
    - ν: innate valuation
    - ρ: parameter denoting rivalrous effect of advertising
    - ξ: parameter denoting expansionary effect of advertising

- Variables:
    - p_i^r is retail price of variety i
    - a_i advertising level of variety i

Institute for
Fiscal Studies

- Let x_1 denote the value of x such that $U_1(x) = U_2(x)$
- Retailer's profit, where σ is market share of retailer:

$$\Pi^R = \sigma[(p_1^r - p_1^w)x_1 + (p_2^r - p_2^w)(1 - x_1)] - a_1^2$$

- Manufacturers' profits:

$$\Pi^{M,1} = \sigma(p_1^w - c)x_1$$
$$\Pi^{M,2} = (p_2^w - c)(1 - x_1) - a_2^2$$

- Solve for subgame perfect equilibrium prices, advertising and SB share

Subgame perfect equilibrium

Retail prices:
$$p_i^r = \frac{4\xi(a_i + a_{-i}) + \rho(3a_i + a_{-i}) + p_i^w - p_{-i}^w - 2\tau + 4\nu}{4}, \; i \in \{1, 2\}$$

Wholesale prices:
$$p_i^w = \frac{3c + \rho(a_i - a_{-i}) + 6\tau}{3}, \qquad i \in \{1, 2\}$$

Advertising:
$$a_1 = \frac{\sigma[\rho^2(3\xi + 2\rho) - 54\tau(2\xi + \rho)]}{3\rho^2(\sigma + 2) - 216\tau}, \quad a_2 = \frac{\rho(\rho\sigma(3\xi + 2\rho) - 36\tau)}{3\rho^2(\sigma + 2) - 216\tau}$$

Store brand market share:
$$x_1 = \frac{\rho^2(\sigma - 2) + 3\xi\rho\sigma + 36\tau}{72\tau - \rho^2(\sigma + 2)}$$

Institute for
Fiscal Studies

Difference in perceived attractiveness of the two varieties

- The bigger the difference in $V_1 - V_2$, the less competitive the wholesale market becomes, increasing the wholesale prices the manufacturers can charge
- Differences in $V_1 - V_2$ make it possible for the retailer to differentiate prices based on product popularity
- Strength of these incentives depends on how advertising affects demand i.e. the relative magnitude of r and g

Institute for
Fiscal Studies

Rivalrous versus expansionary effects of advertising

1. **If effect of advertising is mainly rivalrous**:
   - retailers economise on advertising of their SB: at equal prices, a larger share of consumers would opt for the NB
   - retailers increase prices of the popular NB, while decreasing those of the SB variety, leading to increased profits

2. **If effect of advertising is mainly expansionary**:
   - advertising by the NB manufacturer will be small due to free riding
   - the retailer will capture most of the benefit of advertising: can increase retail prices on both varieties, but competition in wholesale prices won't be relaxed
   - SB variety might be advertised to the point where it is more attractive than the NB variety
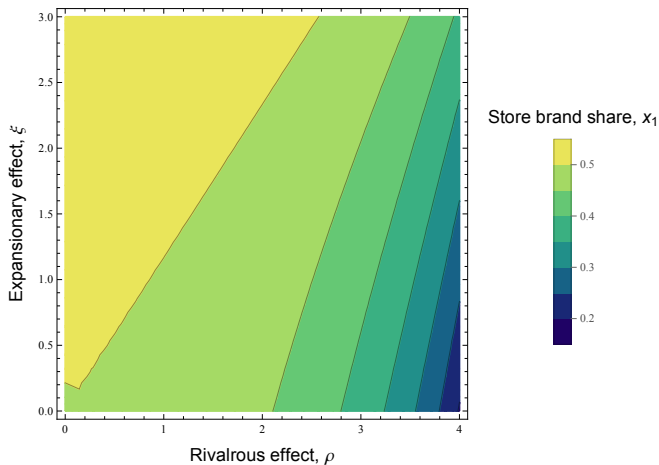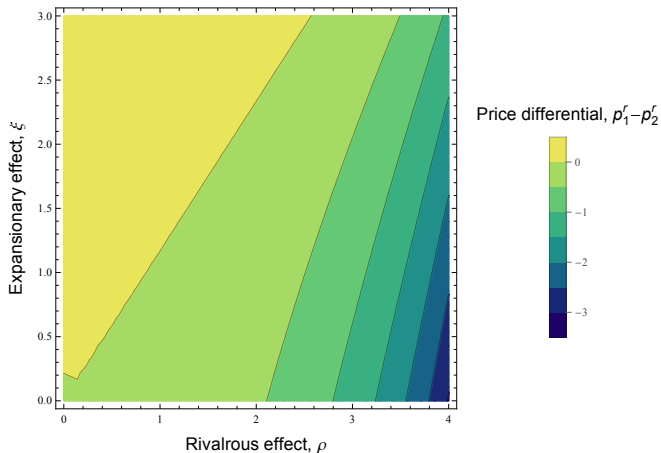
Institute for
Fiscal Studies

Store brand share, x_1

Price differential, $p_1^r - p_2^r$

Empirical approach
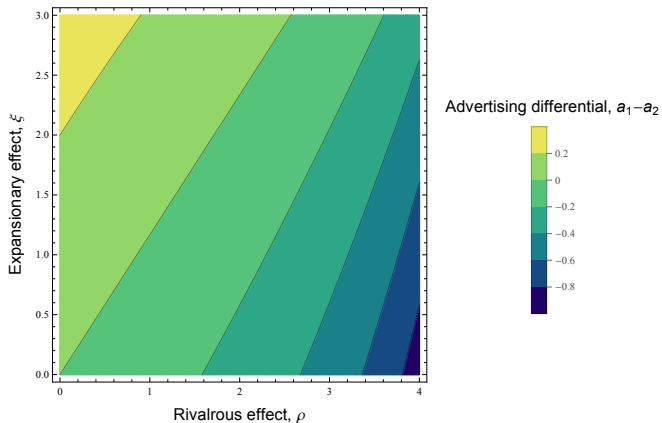
- Data from:
  - Kantar Worldpanel: on store brand market shares across categories and retailers
  - A.C. Nielsen Digest of Advertising: records all brand level advertising expenditure in the UK

- Predictions:
  - in categories in which we observe high retailer advertising (relative to NB manufacturer advertising), we expect the expansionary effect of advertising to dominate
  - we therefore expect there the store brands to have a higher market share in these categories

Institute for
Fiscal Studies

1. Retailer market share, σ:

   - large retailers can enjoy significant spill-over effects due to their advertising positively affecting the demand for the whole category
   - so we would predict that larger stores will have higher SB market share

Differences across retailer type

Big 4	Market share of store brands (%)
Asda	41.19
Morrisons	37.98
Sainsbury	43.16
Tesco	41.47
Smaller, higher value	
Marks + Spencers	98.53
Waitrose	47.48
Smaller, discounter	
Aldi	88.34
Lidl	70.49
Netto	19.73

Institute for
Fiscal Studies

1. Retailer market share, σ:

   - large retailers can enjoy significant spill-over effects due to their advertising positively affecting the demand for the whole category
   - so we would predict that larger stores will have higher SB market share

2. Vertical integration between retailer and store brand manufacturer:

   - wholesale price of the SB remains equal to cost, regardless of the relative attractiveness of the SB
   - retailers can also use this to indirectly put pressure on NB manufacturers to reduce wholesale prices

Institute for
Fiscal Studies

Summary and conclusions

- Develop a model to study the advertising and pricing decisions of retailers and manufacturers over store and national brands
- Allow for wholesale price negotiation between retailers and manufacturers
- Endogenise the advertising decisions, and compare equilibrium outcomes under different effects of advertising:
  - **More rivalrous**: expect to see small market shares of store brands
  - **More expansionary**: expect to see more heavily advertised store brands with bigger market shares
- Prediction robust, in general, to a number of extensions of the model
- Plan to test predictions empirically

Institute for
Fiscal Studies