One-Stop Shopping Behavior and Upstream Merger Incentives

Vanessa von Schlippenbach Christian Wey

DIW Berlin

Trends in the Retail Industry

- **One-Stop Shopping Behavior**
  - Increasing requirements in professional life
  - Time-consuming spare-time activities
  - Buying decision depends on price for the entire shopping basket
  - Positive demand externalities between goods at a single retail outlet
- **Consolidation Process**
  - CR(5) in Germany: 50% (1993), 77,6% (2002)
  - CR(5) in the UK: 50% (1993), 68,3% (2002)
- **Retailers = Essential Intermediaries**
  - Reduced importance of direct sales
  - Products have to pass the decision making screen of an increasingly concentrated retail industry
  - Intensive competition between manufacturers for getting access to retailers' shelf space

- **Do suppliers counter retailers' buyer power by upstream consolidation?**

Objectives & Results

- **Objectives**
  - Impact of retailers' buyer power and consumers' one-stop shopping behavior on upstream merger incentives
- **Main Results**
  - Upstream merger incentives increase with consumers' preference for one-stop shopping.
  - Merged suppliers internalize the positive demand externalities resulting from one-stop shopping $\Rightarrow$ wholesale prices decrease $\Rightarrow$ social welfare increases
  - Suppliers counter retailers' buyer power by negotiating separately
  - Buyer power detrimental to welfare as upstream merger incentives are decreasing in the retailers' buyer power

The Model

- **Structure**
  - Two independent suppliers S_i producing each one single good $i \in \{1, 2\}$
  - One monopolistic retailer R
  - Distribution and production costs normalized to zero
  - Simultaneous negotiations on a linear wholesale price
  - Two different types of consumers: λ one-stop shoppers, $1 - \lambda$ single shoppers ($\lambda \in [0, 1]$).
  - Consumers are unifomly distributed on a line of length 1.

- **Utilities:**
  - Single-Shopper located at $\theta_i^s \in [0, 1]$:

$$U_i^s(\cdot) = \begin{cases} 1 - p_i - \theta_i^s t & \text{if good } i \text{ is bought} \\ 0 & \text{otherwise,} \end{cases}$$

  - One-Stop Shopper located at $\theta_i^o \in [0, 1]$:

$$U^o(\cdot) = \begin{cases} 2 - \sum_{i=1}^{2} p_i - \theta^o t & \text{if goods } i \text{ and } j \text{ are bought} \\ 1 - p_i - \theta^o t & \text{if only one good } i \text{ is bought} \\ 0 & \text{otherwise,} \end{cases}$$

Profits

- **Retailer**:
  - Contracts with both suppliers (separate or merged):

$$\pi\left(p_i, p_j, w_i, w_j, \cdot\right) = \sum_{i=1}^{2}\left(p_i - w_i\right)\left[\lambda q_i^o\left(p_i, \cdot\right) + \left(1-\lambda\right) q_i^s\left(p_i, \cdot\right)\right]$$

  - Negotiation break-down with supplier S_i :

$$\widehat{\pi}_j\left(p_j, w_{j,} \cdot\right) = \left(p_j - w_j\right)\left[\lambda \widehat{q}_j^o\left(p_j, \cdot\right) + \left(1-\lambda\right) q_j^s\left(p_j, \cdot\right)\right]$$

- **Suppliers**:
  - Separate:

$$\varphi_i\left(w_i, \cdot\right) = w_i\left[\lambda q_i^o\left(p_i, \cdot\right) + \left(1-\lambda\right) q_i^s\left(p_i, \cdot\right)\right]$$

  - Merged:

$$\varphi^m\left(w_i, w_j, \cdot\right) = \sum_{i=1}^{2} w_i\left[\lambda q_i^o\left(p_i, \cdot\right) + \left(1-\lambda\right) q_i^s\left(p_i, \cdot\right)\right]$$

  - Negotiation break-down with the retailer:

$$\varphi_i = 0, \varphi^m = 0$$

Timing

1. Suppliers decide whether to merge or not.
2. The retailer bargains either simultaneously with both suppliers or with one merged supplier over wholesale prices.
3. Finally, the retailer sets her prices in final consumer markets and consumers make their shopping decision.

Downstream Prices

- Focussing on interior solutions for $\theta^o(\cdot)$ and $\theta_i^s(\cdot)$, we obtain:

$$p_i^*(w_i) = \frac{1 + w_i}{2}$$

Bargaining

- **Separate Suppliers:**

$$w_i^* \quad : \quad = \arg\max_{w_i} N_i$$
$$\text{with} \quad : \quad N_i := \left[\pi^*(\cdot) - \widehat{\pi}_j^*(\cdot)\right]^{\delta} \varphi_i^*(\cdot)^{1-\delta}$$

- **Merged Suppliers:**

$$w_m^* \quad : \quad = \arg\max_{w_i} N^m$$
$$\text{with} \quad : \quad N^m := \pi^*(\cdot)^{\delta} \varphi^{m*}(\cdot)^{(1-\delta)}$$

- **Results:**
  - $w_i^* \geq w_i^{m*}$ - with equality if $\lambda = 0$
  - $dw_i^* / d\delta < 0, dw_i^{m*} / d\delta < 0$
  - $dw_i^* / d\lambda > 0$

Merger Incentives

- **Merger Incentives:**

$$\Psi(\cdot) := \varphi^{m**}(\cdot) - \sum_{i=1}^{2} \varphi_i^{**}(\cdot)$$

- $\boldsymbol{\lambda = 0}$:
  - $w_i^* = w_i^{m*} \Rightarrow \varphi^{m**}(\cdot)|_{\lambda=0} = \sum_{i=1}^{2} \varphi_i^{**}(\cdot)|_{\lambda=0}$

- $\boldsymbol{\lambda > 0}$:
  - $w_i^* > w_i^{m*} \Rightarrow$ double mark-up problem
  - Trade-off: $w_i^* \uparrow -$ suppliers' share of the total pie is increasing, while the total pie is decreasing.

- $\boldsymbol{\lambda^k}$
  - There exists a unique threshold value $\lambda^k(\delta)$ such that $\varphi_m^{**}\left(\lambda^k, \cdot\right) = \sum_{i=1}^{2} \varphi_i^{**}\left(\lambda^k, \cdot\right)$.
  - $\lambda^k(0) = 0$ and λ^k is monotonically increasing in δ.

Buyer Power, Merger Incentives & Social Welfare

- **Welfare Enhancing:**
  An increase in the retailer's buyer power from δ' to δ'' (with $\delta' < \delta''$) increases social welfare if suppliers remain merged (i.e. $\lambda \geq \lambda^k(\delta''))$ or remain separated (i.e., $\lambda < \lambda^k(\delta'))$.

- **Welfare Decreasing:**
  An increase in the retailer's buyer power reduces social welfare if it triggers a separation of suppliers; i.e., if $\lambda \geq \lambda^k(\delta')$ holds before and $\lambda < \lambda^k(\delta'')$ holds after the increase in buyer power.

Promotional Activities

- **Motivation:**
  - Retail investments in physical, ambient and social features of the in-store environment and provision of conveniences like child care, parking facilities, and well-trained service staff.
  - Consumers benefit differently.
- **Modelling:**
  - In-store conveniences ν affecting only one-stop shoppers.
  - Investment costs $c(\nu)$ with $c', c'' > 0$.
  - One-stop shoppers' utility:

$$U^o(\nu, \cdot) = \begin{cases} 2 + \nu - \sum_{i=1}^{2} p_i - \theta^o t & \text{if goods } i \text{ and } j \text{ are bought} \\ 1 - p_i - \theta^o t & \text{if only one good } i \text{ is bought} \\ 0 & \text{otherwise} \end{cases}$$

Merger Incentives & Optimal Retail Investments

- **Merger Incentives:**

$$\sum_{i=1}^{2} \varphi_i^{**}\left(w_i^*, \nu^k, \cdot\right) \equiv \varphi^{m**}\left(w^{m*}, \nu^k, \cdot\right).$$

  - Merger incentives are positive if $\nu > \nu^k(\lambda)$
  - $d\nu^k(\lambda)/d\lambda < 0$

- **Optimal Retail Investments:**

$$\nu^*(\lambda) := \arg\max \begin{cases} \pi^{**}\left(w_i^*(\nu, \cdot), \nu, \cdot\right) & \nu \leq \nu^k(\lambda) \\ \pi^{**}\left(w_i^{m*}(\nu, \cdot), \nu, \cdot\right) & \nu \geq \nu^k(\lambda). \end{cases}$$

$$d\nu^{m*}/d\lambda > 0$$

- **Maximal investment level $\nu^{\max}$:**

$$\pi\left(p_i^*, w_i^*, \lambda, \nu^*, \cdot\right) \equiv \pi\left(p_i^*, w_i^{m*}, \lambda, \nu^{\max}, \cdot\right).$$

Excessive Investments (cont'd)

Example: Overinvestment for $\delta = 0.1, t = 1$

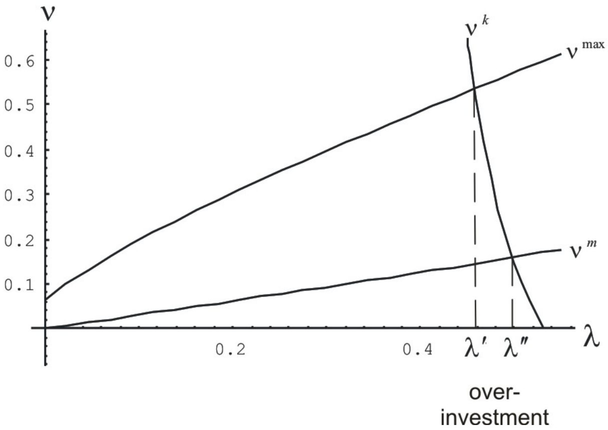

Figure:

Conclusion

- One-stop shopping induces positive demand externalities which are not internalized by separate suppliers.
- Hence, one-stop shopping induces upstream merger incentives.
- However, the more bargaining power the retailer has, the less likely a merger becomes at the upstream level.
- Upstream mergers are always socially beneficial (due to lower wholesale prices).
- Assessing the increasing buyer power of large retail chains gives a rather mixed picture:
  - Increasing buyer power tends to lower wholesale prices which is desirable both from a consumer and a social welfare perspective.
  - However, suppliers may respond to increasing buyer power by separating their business, which raises wholesale prices.