To Surcharge or Not To Surcharge? A Two-Sided Market Perspective of the No-Surcharge Rule.

Nicholas Economides, David Henriques

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Market Power and NSR

- Economides (2009) pointed out that only 13 to 15% of fees charged are necessary to cover the transaction processing cost.
- DOJ-FTC 1992 Guidelines: a market is *highly concentrated* if $HHI > 1800$.

Company	Mkt share
Visa	42%
MC	29%
AmEx	24%
Discover	5%

Data: credit card market shares by purchase volume in the US, in 2007.

$$HHI = \sum_{i=1}^{4} s_i^2 = 3206.$$

- The DOJ takes the NSR to court: MasterCard, Visa settle while AmEx fights the U.S. lawsuit.

THE WALL STREET JOURNAL.
WSJ.com

MONEY | SEPTEMBER 11, 2009, 4:29 A.M. ET

New York Restaurant Loses Its Appetite for Cash

By ASHBY JONES

NEW YORK -- At the Greenwich Village restaurant Commerce, cash is off the menu.

"If you don't have a credit card, you can use a debit card," said the restaurant's co-owner, Tony Zazula. "If you don't have a debit card, you probably don't have a checking account. And if you don't have a checking account, you probably shouldn't be eating at Commerce to begin with.", in The Wall Street Journal, September 11, 2009.

The Research Question

What's the impact of the No-Surcharge Rule on the Electronic Payment System?

The Road Map - Study the NSR impact on:

1. Merchant and cardholder *fees*,
2. Platform *profits* and,
3. Social *welfare*.

Summary of Results

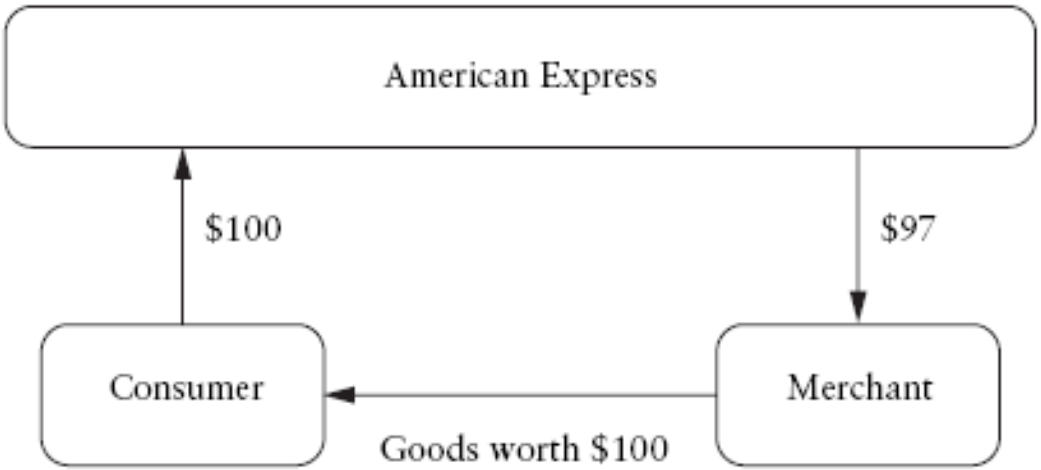
Q.: To Surcharge or Not to Surcharge? A.: It depends!

As a result of the NSR implementation:

1. Merchant fee increases and cardholder fee decreases.
2. Platforms' profits increase *if and only if* network effects from merchants to cardholders are sufficiently weak.
3. Social Welfare increases (decreases) if i) network effects are weak (strong) and ii) merchants market power in the goods market is strong (weak).

The Three-Party Model

- A model with plenty of externalities:



Source: Economides (2009).

- Two *Electronic Payment Networks*, 1 and 2: profit-maximizers that compete simultaneously and non-cooperatively in cardholder (f_1, f_2) and merchant fees (m_1, m_2).
- Payments require the payee (merchant) and the payor (consumers) to have a common payment platform: an EPN or cash (default).

Consumers

- Consumers single-home (Rysman, 2007).
- Each consumer, indexed by h regarding his preferences on platforms, buys 1 unit good from each merchant.
- Consumer's h net utility of having a card from EPN i is given by,

$$U_i^h \equiv U_i^h \left(\underbrace{f_i}_{(-)}, \underbrace{p_i}_{(-)}, \underbrace{D_i^m}_{(+)} \right) , \tag{1}$$

- Consumers demand towards EPN i is the solution of $U_i^h \geq U_j^h$ and $U_i^h \geq 0$.

$$D_i^c = D_i^c \left(f_i - \alpha f_j, S\left(p_i - \alpha p_j\right), D_i^m - \alpha D_j^m \right), \; i, j = 1, 2 \text{ and } i \neq j,$$

$$S = \begin{cases} 1 & \text{if surcharge is allowed,} \\ 0 & \text{if NSR.} \end{cases}$$

Merchants

- Merchants can multi-home and are indexed by their preference to be paid electronically instead of cash, b.
- Additional merchant surplus for accepting electronic payments is given by

$$S^b = \sum_{i=1}^{2} \max\left\{\left(p_i - p_0 + b - m_i\right) D_i^c; 0\right\}. \tag{2}$$

- Merchants demand

$$D_i^m \equiv \Pr\left(b \geq m_i^* - \left(p_i^* - p_0^*\right)\right), \; i = 1, 2. \tag{3}$$

The Goods Market Equilibrium

Lemma (*Goods Market Reduced Form Solution*)

Consider market k characterized by i) constant net marginal cost k of providing the good; ii) consumer willingness-to-pay v; and iii) $v > k$. For any level of competition among firms in the market, there exists a unique $\beta \in [0, 1]$ such that the equilibrium price p_k^* can be written as

$$p_k(\beta) = \beta v + (1 - \beta) k. \tag{4}$$

- In our model, $k = m_i - b$ when the merchant uses EPN $i = 1, 2$ on a sale, and β corresponds to the merchant market power on goods market.

Examples: 1) If the market is perfectly competitive, then $\beta = 0 \Rightarrow p_k = m_i - b$. 2) In a monopoly, $\beta = 1 \Rightarrow p_k = v$.

Platforms

- Platform i's profit maximization problem:

$$\begin{aligned}
\max_{f_i, m_i} \Pi_i &= f_i D_i^c + m_i D_i^m D_i^c,\ i = 1, 2 \text{ and } i \neq j \\
&\quad s.to \\
D_i^c &= D_i^c \left(f_i - \alpha f_j, S\left(p_i - \alpha p_j\right), D_i^m - \alpha D_j^m \right) \\
D_i^m &= D_i^m \left(m_i \right)
\end{aligned}$$

Market Equilibrium Characterization

- Equilibrium prices,

$$\begin{cases} \frac{\partial \Pi_i}{\partial f_i} = D_i^c + f_i \frac{\partial D_i^c}{\partial f_i} + m_i \left(\frac{\partial D_i^m}{\partial f_i} D_i^c + \frac{\partial D_i^c}{\partial f_i} D_i^m \right) = 0 \\ \frac{\partial \Pi_i}{\partial m_i} = f_i \frac{dD_i^c}{dm_i} + \left(D_i^m D_i^c + m_i \left(\frac{dD_i^m}{dm_i} D_i^c + D_i^m \frac{dD_i^c}{dm_i} \right) \right) = 0 \end{cases}$$

$$\Leftrightarrow \begin{cases} m_i^* = \frac{\frac{dD_i^c}{dm_i} - \frac{\partial D_i^c}{\partial f_i} D_i^m}{\frac{dD_i^m}{dm_i} \frac{\partial D_i^c}{\partial f_i}} \\ f_i^* = -\frac{\frac{dD_i^m}{dm_i} D_i^c + D_i^m \left(\frac{dD_i^c}{dm_i} - \frac{\partial D_i^c}{\partial f_i} D_i^m \right)}{\frac{\partial D_i^c}{\partial f_i} \frac{dD_i^m}{dm_i}}. \end{cases} \tag{5}$$

- Platform i's profit at equilibrium,

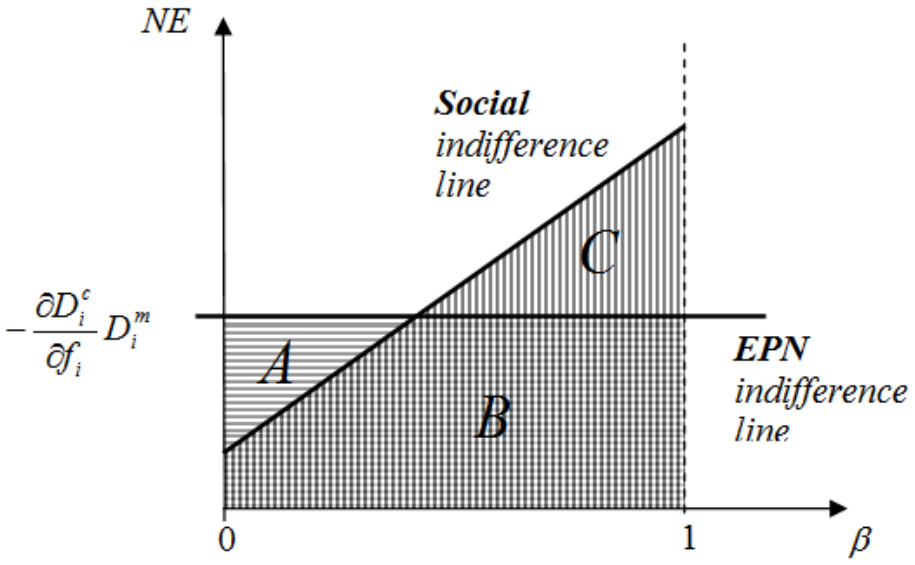
$$\Pi_i^* = \frac{(D_i^c)^2}{-\frac{\partial D_i^c}{\partial f_i}}. \tag{6}$$

The NSR Impact on Equilibrium Fees

Theorem (*The unbalanced pricing structure under the NSR*)

Relatively to the market equilibrium with surcharging, the EPN pricing structure under the NSR decreases cardholder membership fee and increases merchant per transaction charges.

To Surcharge or Not to Surcharge?



Social and EPN's indifference lines.

- Social optimal choice and platform's optimal choice are not necessarily different – but sometimes they are!

The NSR is profitable to platforms in areas $A + B$.
The NSR is socially desirable in areas $B + C$.

Takeaway

Q.: Is the NSR socially desirable?

$$\text{A.} = \begin{cases} \text{YES}, & \text{if merchants have sufficient market power,} \\ \text{NO}, & \text{if competitive.} \end{cases}$$

This assumes sufficiently weak network effects from merchants to cardholders.