

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

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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.

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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

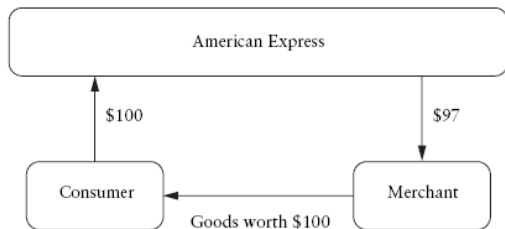
## Q.: To Surcharge or Not to Surcharge? A.: It depends!

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,

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

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

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

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

# 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

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

- Merchants demand

$$D_i^m \equiv \Pr (b \geq m_i^* - (p_i^* - p_0^*)), \quad i = 1, 2. \quad (3)$$



# 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

$$p_k(\beta) = \beta v + (1 - \beta) k. \quad (4)$$

- In our model,  $k = m_i - b$  when the merchant uses EPN  $i = 1, 2$  on a sale, and  $\beta$  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:

$$\max_{f_i, m_i} \Pi_i = f_i D_i^c + m_i D_i^m D_i^c, \quad i = 1, 2 \text{ and } i \neq j$$

*s.t.*

$$D_i^c = D_i^c (f_i - \alpha f_j, S(p_i - \alpha p_j), D_i^m - \alpha D_j^m)$$

$$D_i^m = D_i^m (m_i)$$

# Market Equilibrium Characterization

- Equilibrium prices,

$$\Leftrightarrow \begin{cases} \frac{\partial \Pi_i}{\partial f_i} = D_i^c + f_i \frac{\partial D_i^c}{\partial f_i} + m_i \left( \frac{\partial D_i^m}{\partial f_i} D_i^c + \frac{\partial D_i^c}{\partial f_i} D_i^m \right) = 0 \\ \frac{\partial \Pi_i}{\partial m_i} = f_i \frac{dD_i^c}{dm_i} + \left( D_i^m D_i^c + m_i \left( \frac{dD_i^m}{dm_i} D_i^c + D_i^m \frac{dD_i^c}{dm_i} \right) \right) = 0 \\ m_i^* = \frac{\frac{dD_i^c}{dm_i} - \frac{\partial D_i^c}{\partial f_i} D_i^m}{\frac{dD_i^m}{dm_i} \frac{\partial D_i^c}{\partial f_i}} \\ f_i^* = - \frac{\frac{dD_i^m}{dm_i} D_i^c + D_i^m \left( \frac{dD_i^c}{dm_i} - \frac{\partial D_i^c}{\partial f_i} D_i^m \right)}{\frac{\partial D_i^c}{\partial f_i} \frac{dD_i^m}{dm_i}}. \end{cases} \quad (5)$$

- Platform  $i$ 's profit at equilibrium,

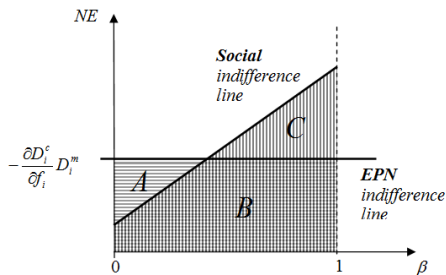
$$\Pi_i^* = \frac{(D_i^c)^2}{-\frac{\partial D_i^c}{\partial f_i}}. \quad (6)$$

# 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?

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.