MUST-TAKE CARDS AND THE TOURIST TEST

Jean-Charles ROCHET
Jean TIROLE

IDEI, Toulouse university

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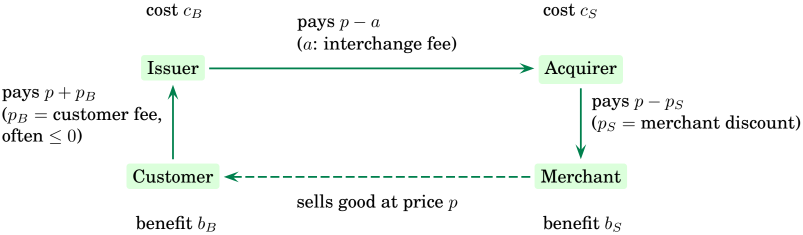
In open card payment systems (Visa, MasterCard), merchant's bank (acquirer) pays an interchange fee to customer's bank (issuer):

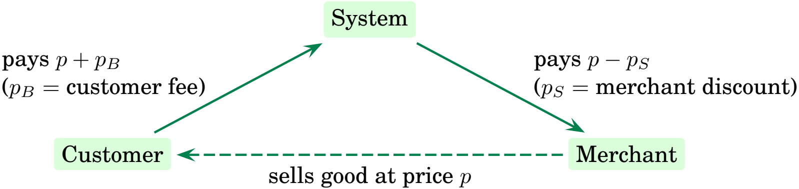


[• Costs and benefits are net (i.e., relative to a cash or check payment).
• Price coherence: p same regardless of means of payment.]

Interchange fees

- ✓ are determined collectively at system level,
- ✓ are challenged by retailers, antitrust authorities and regulators in several regions of the world (US, EU, UK, Australia, Israel,...), who argue that merchants cannot reasonably turn down cards and are therefore forced to accept excessively high merchant discounts: cards are "*must-take cards*" (Vickers 2005).

Similar concerns will arise with respect to merchant discount of proprietary (closed) system such as Amex or Discover:



Outline

We shed light on the must-take card argument in three ways:

- ✓ We match this argument with an empirical test ("*tourist-test*").
- ✓ We identify 2 reasons why this benchmark may be biased:
  - (1) long-term effects are neglected,
  - (2) retailers may be heterogeneous.
- ✓ We compare the price structure chosen by card networks with the socially optimal price structure.

II. BAXTER (1983)'S ANALYSIS

The price *structure* of card payments (how the total cost is allocated between the two users, cardholder and retailer) determines the efficiency of card usage:

- how many consumers hold cards
- how many retailers accept cards

(membership externality)

- how often cardholders *use* their cards: usage externality

  [focus of presentation.]

USAGE EXTERNALITY

When a cardholder decides to pay by card, instead of check or cash, it impacts:

- the retailer's operating cost:

  $+$: *merchant discount*: p_S

  $-$: *avoided cost* of alternative payment instrument (fraud, theft, accounting,...): b_S.

- The banks' net cost:

  $+$: *total marginal cost* (acquirer + issuer): c

  $-$: *revenue* collected from merchant: p_S.

  Total usage externality: $\boxed{c - b_S.}$

EFFICIENT USAGE

Efficient usage of cards is obtained (social welfare is maximized) when the cardholder faces the correct price signal:

$$\underset{\text{efficient cardholder fee}}{p_B^*} = \underset{\text{total usage externality}}{c - b_S}$$

There is excessive (insufficient) card usage if cardholder fee is too low (too high).

[With different types of cards (debit and credit), the difference in fees has to equal the difference in usage externalities.]

The role of interchange fees

Baxter (1983): *perfectly competitive banks.*
Social welfare maximized if:

$$\text{card payment} \iff b_B + b_S \geq c_B + c_S = c.$$

Efficiency requires appropriate interchange fee (IF):

$$\boxed{a^W = b_S - c_S} \implies p_B = c_B - a^W = c - b_S \text{ and } p_S = c_S + a^W = b_S$$

$$\text{Customers use card} \iff \boxed{b_B \geq p_B = c - b_S}$$

Note that optimal IF is merchant specific.

Limits of Baxter's analysis

- ✓ Banks unlikely to charge marginal costs (if only because of existence of fixed costs).
- ✓ Baxter's IF requires knowledge of merchant's convenience benefit b_S.
- ✓ Does not address must-take card concern: because $p_S = b_S$, card acceptance does not increase merchants' operating cost.
- ✓ IF selected by payment system, not by a benevolent social planner.

III. MUST-TAKE CARDS AND THE TOURIST TEST

- ✓ Consumers/buyers' benefit b_B distributed according to c.d.f. $H(b_B)$. Generates downward-sloping demand for card usage:

$$D_B(p_B) = \Pr\ (b_B \geq p_B) = 1 - H(b_B).$$

- ✓ Merchants/sellers' convenience benefit b_S same for all merchants in a first step (heterogeneity, if any, is observable).

  Merchants set retail prices and decide whether to accept cards (compatible with different models of retail sector: Hotelling-Salop, local monopolies, differentiated Bertrand,...).

- ✓ For the moment: monopoly network.

✓ Banks

Issuers:

- Cost per transaction $c_B \implies$ net cost $c_B - a$.
- Cardholder fee in symmetric oligopoly: $p_B = c_B - a + m$.
- Issuer profit increases with interchange fee.

Assumption:

Constant issuer margin m (relaxed later).

Acquirers:

- Cost per transaction $c_S \implies$ net cost $c_S + a$.
- Competitive $\implies$ charge merchant discount

$$p_S = c_S + a.$$

Timing

- Cooperative sets interchange fee.
- ✓ Issuers set cardholder fees, acquirers set merchant discounts.
  ✓ Merchants accept card? Merchants set retail prices.
- Consumers observe retail prices/card acceptance policies, and pick merchant.
- Consumers observe b_B, and choose payment means.

Important parameter : probability α with which consumers observe card acceptance by merchants (may vary across sectors).

Merchant acceptance

Assumption:

At equilibrium, merchants accept card iff

$$\underset{\substack{\text{merchant}\\\text{discount}}}{p_S} = c_S + a \geq \underset{\substack{\text{direct}\\\text{benefit}}}{b_S} + \underset{\substack{\text{strategic}\\\text{benefit}}}{s(\alpha, p_B)}$$

[s positive, decreasing in p_B, increasing in α; $\partial^2 s / \partial\alpha\partial p_B < 0$.]

Holds for different models of retail sector (Hotelling-Salop, monopolies, differentiated Bertrand,...)

For example in the Salop model with uniform distribution of consumers:

$$s(\alpha, p_B) = \alpha E\left[b_B - p_B | b_B \geq p_B\right] \equiv \alpha v_B(p_B)$$

Intuition: What matters for the merchant is not only his own transaction cost, $\gamma = (p_S - b_S)\, D_B\,(p_B)$, but also the impact on consumer demand :

$$\alpha D(p-u) + (1-\alpha)D(p) \text{ where } u = E\left[\max\left(0, b_B - p_B\right)\right]$$
$$= v\,(p_B)\, D_B\,(p_B)\,.$$

Example: *monopoly retailer* accepts card iff:

$$\max\left\{(p - C - \gamma)[\alpha D(p-u) + (1-\alpha)D(p)]\right\} \geq \max\left\{(p-C)D(p)\right\}$$
$$\iff \quad \gamma < \Psi\,(\alpha, p_B) \text{ or } p_S - b_S < s\,(\alpha, p_B)\,.$$

Also true for differentiated Bertrand competition.

IMPLICATION: a monopoly network selects the maximum interchange fee that is compatible with merchant acceptance.

This is because banks' profit increases with the volume of card payments and thus with the interchange fee.

Merchants accept cards iff $p_S = c_S + a \leq b_S + s(\alpha, p_B)$.

This is equivalent to $a \leq \boxed{a^m \equiv b_S - c_S + s(\alpha, p_B)}$

Essence of must-take card argument

Welfare

Social welfare,

$$W = \int_{p_B}^{\infty} (b_B + b_S - c_B - c_S)\, dH\,(b_B)\,,$$

is maximized when:

$$p_B^W = c_B - a + m = c_B + c_S - b_S \iff a = \boxed{a^W = b_S - c_S + m.}$$

This exceeds Baxter's benchmark because of the need to internalize issuers' margin m.

[a^W *may* also exceed the monopoly interchange fee:

$$a^m \equiv b_S - c_S + s\,(\alpha, p_B)\,.]$$

Total user (buyer + seller) surplus is maximized when the cardholder pays the net cost (usage externality) inflicted on the seller alone (cost includes the profit margin m of banks).

$$TUS = \int_{p_B}^{\infty} (b_B + b_S - c - m)\, dH\,(b_B)$$

(user surplus maximizing) cardholder fee = usage externality on seller

$$p_B^{TUS} = \underbrace{c - b_S}_{\text{net cost}} + \underbrace{m}_{\substack{\text{profit}\\ \text{margin}}}$$

THE TOURIST TEST 1 (DEFINITION)

The merchant discount passes the tourist test if the retailer's net cost does not increase when a customer pays by card instead of cash/check:
merchant discount $\leq$ net avoided cost of retailer, or

$$\boxed{p_S \leq b_S}$$

- ✓ Why call it the "tourist" test?
- ✓ With a repeat customer, accepting the card may induce additional sales in the future [increases Quality of Service]. The maximum interchange fee that passes the tourist test is denoted a^T.

THE TOURIST TEST 2 (PROPERTIES)

The tourist test threshold corresponds to the price structure that maximizes total user surplus (related to Farrell, 2006):

Total price of a card payment	=	Total cost	+	Total margin
$p_B + p_S$	=	c	+	m

Thus

$$\boxed{p_B = b_S} \implies p_B = c + m - b_S \equiv p_B^{TUS}.$$

Proposition:

The interchange fee that maximizes total user surplus is equal to a^T (tourist test threshold). It is smaller than the socially optimal IF: $a^W = a^T + m$.

SOCIAL WELFARE VS USER SURPLUS

- ✓ Competition Authorities often care only about user surplus and not about social welfare.
  - This is justified if the profit of firms (banks) is completely dissipated (business stealing, useless advertisements).
  - This is not justified if profit is reinvested to provide better quality of service or attracts entry (lower prices, increased product variety).
- ✓ Long-term user surplus maximized for a value of merchant discount that is *above* tourist test threshold.

IV. VARIABLE MARGINS, ISSUER ENTRY, AND HETEROGENOUS MERCHANTS

(1) *Variable margins*

Suppose now that issuer margin m varies :
$p_B = c_B - a + m(p_B)$.

$$TUS(p_B) = \int_{p_B}^{\infty} [b_B + b_S - c - m(p_B)]\, dH(b_B)$$

$$TUS'(p_B) = [p_B + b_S - c - m(p_B)]\, D_B'(p_B) - m'(p_B)\, D_B(p_B).$$

Proposition:

The interchange fee a^{TUS} that maximizes total user surplus is higher than a^T when $m' > 0$ (cost amplification) and lower than a^T when $m' < 0$ (cost absorption). In either case, the socially optimal IF exceeds a^T.

(2) *Issuer entry*

We model issuer entry in two polar cases: (a) homogeneous issuers, and (b) pure product variety.

[Case (a): Mankiw-Whinston 1986: too much entry due to business stealing. (b) Contestable niches: rules out business stealing.]

(a) Proposition:

For an homogeneous issuing industry with free entry, the interchange fee a^* that maximizes long-term TUS satisfies:

$$a^{TUS} \leq a^* \leq a^W.$$

It passes the tourist test iff there is long-term cost absorption.

(b) Proposition:

In the pure-product-variety model with free entry, the interchange fee that maximizes long-term total user surplus always fails the tourist test.

(3) *Heterogenous merchants*

Heterogeneous b_S: merchants' "demand function"
$D_S(p_S) = \Pr(b_S \geq p_S)$.

- ✓ Buyers fully informed about sellers' acceptance of cards ($\alpha = 1$).
- ✓ Card transactions take place only if both parties agree.

  Volume of card transactions:
  $V = D_B(p_B) D_S(p_S - s(1, p_B))$.

For simplicity we only look at perfect competition benchmark:

$$p_B = c_B - a$$
$$p_S = c_S + a.$$

The optimal interchange fee is obtained when the tourist test is satisfied for the *average* merchant:

$$\boxed{p_S = E[b_S | \text{merchants accept cards}]}$$

V. SYSTEM COMPETITION

Back to:

- homogeneous sellers: b_S
- competitive acquirers: $p_S = c_S + a$
- constant margins for issuers: $p_B = c_B - a + m$.

Two systems $i = 1, 2$, offering identical cards

Proposition:

- If consumers have only one card (single-homing) the competitive outcome is identical to the monopoly outcome (must-take card argument applies).
- If consumers have both cards (multi-homing), then at the competitive equilibrium, networks set identical fees

$$a^{MH} = b_S - c_S - \frac{D_B}{D'_B}\left[m' - (1 - \alpha)\right]$$

$a^{MH} \leq a^{TUS}$ (with $=$ iff $\alpha = 1$); $a^{MH} \leq a^{T}$ iff $m' \leq 1 - \alpha$.

Social welfare is maximum for $a^* = b_S - c_S + m$.

CONCLUSION

Must-take card argument: Retailers are forced to accept cards that increase their operating cost. Accordingly the merchant discount fails the tourist test.

- ✓ This argument is correct if customers have only one card, but incorrect if enough customers have several cards (multi-homing).
- ✓ With heterogeneous retailers, the tourist test is relevant only for the *average* retailer.
- ✓ The tourist test corresponds to a static view of the industry, and does not account for the impact of the IF on entry.