Market Definition and Market Power in Payment Card Networks

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3. Relevant markets for two-sided products
   - Purposes of merger review
   - The Hypothetical Monopolist Test
   - Applying the SSNIP test to two-sided markets
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Some Antitrust Cases of Interest

- Restrictions on Issuers
  - U.S. v. Visa and Mastercard
- Horizontal Merger of networks
  - U.S. v. First Data and Concord
- Restrictions on merchant acceptance
  - In re Visa Check/MasterMoney Antitrust Litigation
- Challenges to interchange
  - National Bancard (“NaBanco”) v. Visa USA

“Two-sidedness” of payment card network markets

- Payment card networks move money and information between
  - card issuers, and
  - merchants (or their agents).
- Hence two prices for a single transaction.
- Hence two marginal revenues of concern.
- Complicated interactions between the two sides.
- Possibly difficult welfare analysis
- Efficient pricing may be above or below marginal cost on one side or the other.

Goals of the Paper

- Market definition for network service markets.
  - Can the hypothetical monopolist paradigm be used in a two-sided market?
  - How?
- Insights into measurement of market power.
- Which factors influence where market power is expressed.

Monopoly pricing in two-sided markets

Assumptions:

- A single firm monopolizes sales of network transactions.
- Network transactions are a homogeneous service sold to issuers and merchants.
- The network is not vertically integrated into issuance.
- The monopolist is independent, profit-maximizing and unregulated.

Prices

- Demand depends on three prices set by the monopolist:
  - Merchant switch fees: s_m
  - Issuer switch fees: s_i
  - Interchange fee paid from merchants to issuers: X.
- Demand depends on net prices:
  - To merchants: $p_m = s_m + X > 0$
  - To issuers: $p_i = s_i - X < 0$
- Price normalization: $s_i = 0$
  - $p_i = -X$.

Total Price and Margins

- Interchange is passed through.
- The "total price" retained by the network is

$$s \equiv s_m + s_i$$

$$s = p_m + p_i$$

- Assume constant marginal cost c.
- Variable margin per transaction is $s - c$.

Demand

- The network faces a single demand that depends on two net prices:

$$Q = Q(p_m, p_i)$$

- Profit maximization requires attention to two separate price margins.
- Demand slopes downward in each price.
- "Price reduction" on the issuer side
  - means that p_i becomes more negative.
  - is the same as an increase in interchange X.

Responses to increases in p_m.

- Merchant behavior
  - card acceptance
  - routing decisions on ‘multiply-bugged’ cards
  - surcharges (if permitted)
  - non-price incentives, persuasion, etc.
  - general price increases

Responses to increases in p_m.

- Cardholder responses
  - switch payment method
  - purchase elsewhere
  - purchase less
  - present the card less often
- Issuer responses
  - lower fees
  - increase rewards
  - switch networks
- Parallel responses to increases in p_i.

Profit maximization

The independent monopolist solves

$$\max_{p_m, p_i} (p_m + p_i - c) Q(p_m, p_i)$$

or equivalently

$$\max_{X, s_m} (s_m + s_i - c) Q(s_m + X, s_i - X)$$

First order conditions:

$$\frac{\partial Q}{\partial p_m} - \frac{\partial Q}{\partial p_i} = 0$$

$$Q + (s - c)\frac{\partial Q}{\partial p_m} = 0.$$

Choice of Interchange by an Independent Monopolist.

The monopolist chooses interchange to balance marginal demand on both sides of the market:

$$\frac{\partial Q}{\partial p_m} = \frac{\partial Q}{\partial p_i}$$

Alternatively

$$\frac{p_m}{p_i} = \frac{\epsilon_m}{\epsilon_i}$$

where ϵ_m and ϵ_i denote the two demand elasticities.

(Note: $\epsilon_i > 0$.)

Choice of Interchange by an Independent Monopolist.

This demand balancing

- maximizes the number of transactions, given switch fees.
- maximizes the value of output given the total price.
- is conditionally efficient.
- arises because interchange is passed through.

Choice of Interchange by an Independent Monopolist.

Given freedom to choose other prices, the independent monopolist's incentives are essentially competitive with respect to interchange.

The monopolist is interested in interchange fees only to the extent that this price influences the total amount of business done on the network.

Choice of Switch Fees by an Independent Monopolist.

Optimal switch fees:

$$\frac{s-c}{p_m} = -\frac{1}{\epsilon_m},$$

Note that

$$s - c = p_m - c_m$$

where

$$c_m \equiv c + X$$

So

- a Lerner condition applies to the merchant price
- *provided* marginal cost is adjusted to include the interchange rate.

Choice of Switch Fees by an Independent Monopolist.

Optimal switch fees:

$$\frac{s-c}{X} = \frac{1}{\epsilon_i}.$$

Note that

$$s - c = v - X$$

where

$$v \equiv p_m - c$$

is the value of a marginal transaction before netting out the cost of obtaining issuer participation.

This is a standard monopsony pricing condition.

Choice of Switch Fees by an Independent Monopolist.

Optimal switch fees:

$$\frac{s-c}{s} = -\frac{1}{\epsilon_s}$$

where

$$\epsilon_s = s\epsilon_m/p_m = s\epsilon_i/p_i$$

is the elasticity of demand with respect to total switch fees.

This characterization assumes that interchange fees are adjusted optimally.

Concentrated Demand.

Let

$$Q^*(s) = \max_X Q(s + X, -X).$$

Then ϵ_S is the elasticity of this concentrated demand function Q^* with respect to the total price s.

The total price satisfies a Lerner condition for monopoly pricing in a one-sided market, provided that we evaluate demand using the concentrated demand function.

Approach to market definition.

- The basic approach is that laid out in the DOJ/FTC *Horizontal Merger Guidelines*.
- Official U.S. policy for merger review.
- Study of mergers captures generally applicable concepts pertaining to two-sided products.
- May be useful for nonmerger cases that present similar issues.
- We do not consider geographic market issues.

Mergers and market power.

"The unifying theme of the Guidelines is that mergers should not be permitted to create or enhance market power or to facilitate its exercise. Market power to a seller is the ability profitably to maintain prices above competitive levels for a significant period of time. . . . In any case, the result of the exercise of market power is a transfer of wealth from buyers to sellers or a misallocation of resources."[1]

[1] *Guidelines*, section 0.1. The *Guidelines* define market power for buyers in analogous fashion.

Role of market definition under the *Guidelines*

- Market definition under the Guidelines is intended to facilitate an initial screen.
- The screen is based on analysis of concentration within the market.
- The screen is not useful if even extreme concentration (i.e. monopoly) would not create market power.
- The *Guidelines* test asks, in effect, whether the candidate market is worth monopolizing.

The Hypothetical Monopolist Test

- For a candidate market, would a profit-maximizing, unregulated monopolist profitably impose at least a small but significant and non-transitory increase in price—a ‘SSNIP?’
- If not then the market must be expanded.
- A relevant market is the smallest market that passes this test.
- Requires an understanding of monopoly pricing.

Which price?

Which of many prices to use for a SSNIP test in a two-sided market?

- Turn to the principles behind market definition.
- We want a price for which a SSNIP represents an exercise of market power.
- A relevant market is a collection of products, not prices.
  - A given product is either in or out.
  - It can’t be in one one side and out on the other.
  - So we need a single test, using one price.

Which price?

The interchange rate X is not an appropriate candidate for a SSNIP test.

- The independent network monopolist does not retain interchange.
- The independent monopolist chooses interchange to maximize output.
- This ‘balancing’ does not correspond to market power.
- This is efficient, assuming no distortions elsewhere.
- No consensus on the competitive level of interchange.
- Whether interchange is ‘above’ or ‘below’ a competitive price depends on which side of the market you are on.

Which price?

Generally, the net prices on either side of the market are also inappropriate candidates for a SSNIP test.

- A price increase on one side could be offset by a price decrease on the other.
- A change in interchange has this effect.
- So using these prices has similar issues.
- You have to look at both sides of the market at once to use these prices.

The total price is right.

The "total price" s is the most appropriate candidate for a SSNIP test.

- The closest analog to the single price in a one-sided market.
- Conventional analysis can be applied to s by using the concentrated demand function Q^*.
- An increase in s raises the monopolist's margin – the classic motivation for exercising market power.

The total price is right.

Additional reasons why the “total price” s is the most appropriate candidate for a SSNIP test.

- Concentrated demand Q^* is decreasing in s.
- So a SSNIP in s necessarily reduces output.
- This creates a presumption of reduced welfare, at least to the extent that it does in a one-sided market.

Scenario 1: Market power against issuers only.

- All consumers carry a single card, each with a single network brand.
- Merchants will accept any card with a price below the cost of alternatives.
- Merchants can’t steer, so each price rises to the threshold.
- Competition between networks reduces the exercise of market power on the issuer side, with no effect on merchants.

Scenario 2: Market power against merchants only.

- Consumers demand only payment cards that carry all network brands.
- Merchants can route transactions to the lowest priced network.
- Issuers must issue on every network if they can cover costs.
- Interchange falls to the lowest level meeting this condition.
- Increasing numbers of networks make it increase routing competition.
- So competition between networks reduces the exercise of market power on the merchant side, with no effect on issuers.

Scenario 3: Reduced competition shifts the balance.

- All consumers carry multiple cards, each supporting a single network.
- Merchants cannot steer, but there is a decreasing value to accepting each additional network.
- Networks are undifferentiated on the issuer side.
- Bertrand competition between networks for issuer business drives network profits to zero for any concentration short of monopoly.
- So increasing competition lowers merchant prices and issuer compensation by the same amount.
- The only effect of increased competition is a reduction of interchange.

Conclusions

- Conventional approaches extend to two-sided markets.
- To apply the *Guidelines*' market definition test,
  - apply the SSNIP test to the total network price,
  - allow relative prices on both sides to adjust optimally.
- Increasing concentration
  - can raise price on either side.
  - can lower price on one side.
- Analysis of market power requires attention to both sides.