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ELIMINATION OF COMPETITORS: SOME ECONOMICS OF PAYMENT CARD ASSOCIATIONS

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Abstract

This paper analyzes platforms and rejections in two-sided markets with network externalities, using the specific context of a payment card association. We study the cooperative antitrust determination of the interchange fee by member banks. We use a framework in which banks and merchants may have market power and consumers and merchants decide rationally on whether to buy or accept a payment card developed by Rochet and Tirole (2002). After drawing the welfare implications of a cooperative determination of the interchange fee and antitrust conducts, we describe in detail the factors affecting merchant resistance, compare cooperative and for-profit business models, and make a first cut in the analysis of system competition.

Keywords: competition; credit card; antitrust
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1. Introduction

The rapid growth in the use of payment cards is a striking feature of modern economies. It is characterized by the existence of strong network externalities: In a payment card transaction, the consumer's bank, called the issuer, and the merchant's bank, the acquire, must cooperate to enable the transaction. Two successful not-for-profit joint ventures, Visa U.S.A., Inc. ("Visa U.S.A." or "Visa") and MasterCard International, Inc. ("MasterCard"), have designed a set of rules to govern the "interconnection" between their members: (i) Interchange fee, (ii) Honor-all-cards rule, and (iii) No-surcharge rule. Further more, two successful for-profit firms, American Express and Discover, are the same rules.

Some of these institutional features have gained wide acceptance and rationalized. To see the benefits of a centrally determined interchange fee cum the honor-all-cards rule, it suffices to envision the complexity of bilateral bargaining among thousands of banks as well as the cost for issuers of informing consumers about the set of merchants with whom an agreement has been reached. The latter transactions costs could be avoided by keeping the honor-all-cards rule while letting issuers and acquires set their pairwise interchange fees. However, an individual issuer would then be able to impose an arbitrarily high interchange

fee, since the acquirer would then face the grim choice between accepting this fee on a fraction of her payments and exiting the industry altogether. Individual issuers would become bottlenecks, and their free riding would dissuade acquirers from entering the industry.

Two features of these interconnection rules are viewed with suspicion by competition authorities and by some economists. (See, e.g., Frankel (1998) and Carlton and Frankel (1995).) First, the no-surcharge rule is sometimes view as an attempt by payment card systems to leverage their market power by forcing more card transactions than is efficient. Second, the collective determination of the interchange fee is seen by some as a potential instrument of collusion. Recently, after all, we obtained a court decision on an antitrust law suit about the card systems' exclusionary agreement.

The U.S. Department of Justice ("DOJ") brought a civil enforcement action challenging the organizational structure of two of the nation's four major payment card systems. The complaint charged that MasterCard and Visa U.S.A., which are organized as joint ventures owned by their member banking institutions, conspired to restrain trade in two ways: (1) By enacting rules permitting a member-owner of one to function as a director of the other (an arrangement the government described as "dual governance") (Count I); and (2) by

enacting and enforcing "exclusionary rules," which prohibit their member banks from issuing American Express ("Amex") or Discover cards (Count II).

After a 34-day trial, the court, in a commendably comprehensive and careful opinion, ruled in the defendants' favor as to dual governance (Count I). As to Count II, however, the court held that Visa U.S.A. and MasterCard violated the antitrust act by enforcing their respective versions of the exclusionary rule, barring their member banks from issuing Amex or Discover cards. The court further held that Visa International ("Visa International"), which owns the Visa brand, licenses it to Visa U.S.A., and exercises certain governance powers over Visa U.S.A., was liable for participating in Visa U.S.A.'s violation. The court ordered the exclusionary rules revoked and permanently enjoined all three defendants from promulgating similar rules in the future. (See generally United States v. Visa U.S.A., Inc., 163 F.Supp.2d 322 (S.D.N.Y.2001) (opinion and Proposed Final Judgment); United States v. Visa U.S.A., Inc., 183 F.Supp.2d 613 (S.D.N.Y.2001) (modifications to Proposed Final Judgment).)

The defendants, MasterCard, Visa U.S.A., and Visa International, brought appeal. Visa U.S.A. and MasterCard argue that the district court erred in its conclusion that their

respective exclusionary rules violate the Sherman Act. Visa International contends there was no adequate basis to hold it liable for Visa U.S.A.'s violation[1].

The U. S. Court of appeals for the second circuit affirms the judgment (hereinafter, the "Judgment").

This article analyzes the validity of the concern. To provide a policy analysis, it develops a normative framework of the determination of an efficient interchange fee and of impact of the antitrust agreement. The strength of this paper's approach relative to the previous literature (contrary to Rochet and Tirole (2002)) is that we build in antitrust effects and are able to show a proper welfare analysis. That literature focused on the payment system strategic mechanism based on the market power premises. Namely, it assumes that issuers have some market power, while acquires are in competitive (no market power) alternatively. It seems to be a kind of general situation, but is not a good analogy. The similar argument in the courtroom is not accepted with these mentioned:

> "Visa U.S.A. and MasterCard, however, are not single entities; they are consortiums of competitors. They are owned and effectively operated by some 20,000 banks, which compete with one another in the issuance of payment cards and the acquiring of merchants' transactions. These 20,000 banks set the policies

[1] This count is omitted in this paper.

of Visa U.S.A. and MasterCard. These competitors have agreed to abide by a restrictive exclusivity provision to the effect that in order to share the benefits of their association by having the right to issue Visa or MasterCard cards, they must agree not to compete by issuing cards of Amex or Discover. The restrictive provision is a horizontal restraint adopted by 20,000 competitors.[2]"

This article is organized as follows: Section 2 describes the working of the payment card industry and antitrust conducts. Section 3 develops the model. Section 4 re-interprets of the model under antitrust conducts. Section 5 compares the findings with those in the prior literatures. Section 6 summarizes the main insights and discusses some topics for future research.

2. Working of the payment card industry

A card payment is a service offered to two parties (the cardholder and the merchant) jointly by two other parties (the issuer and the acquirer). The left side of Figure 1 shows the costs and benefits attached to a card transaction. The total cost of this service is the sum of the issuer's cost C_I and the acquirer's cost C_A. Suppose that the benefit accruing to the cardholder (or buyer) for the marginal use of a payment card is equal to b_B. Similarly, the

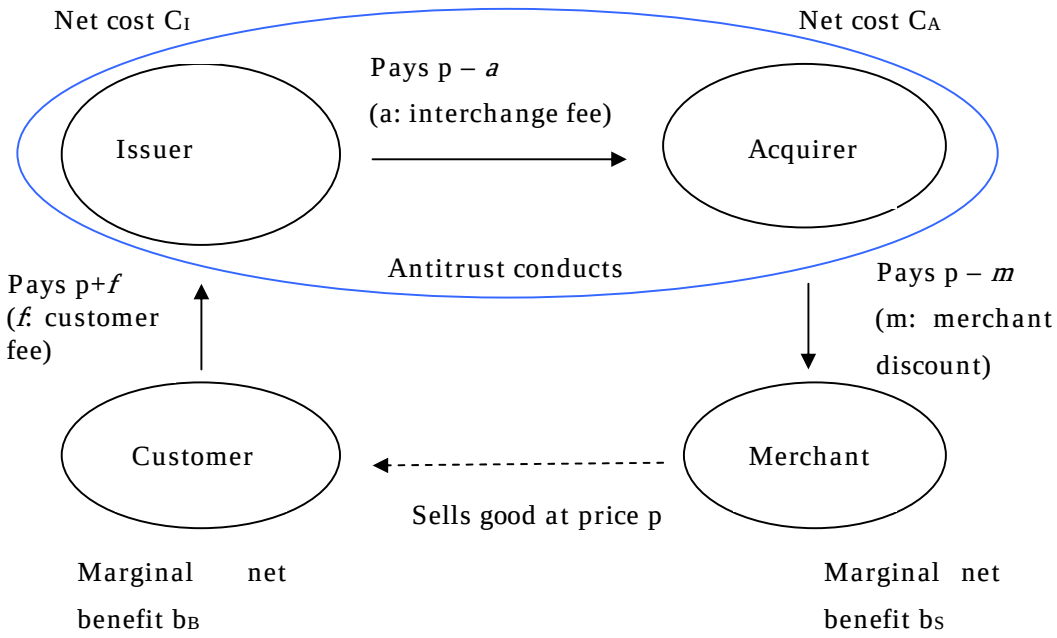
[2] See the Judgment: III The Defendants' Arguments, A Harms to Competition, Paragraph Five.

benefit to the merchant (or seller) of this marginal use of a payment card is b_S. The benefits b_i and costs c_i referred to above are net benefits and costs. The cardholder and the merchant must compare the utilities they get by using payment cards with those associated with alternative payment methods (cash, checks, etc.). At the social optimum, the total benefit of the marginal transaction, b_B+b_S, is equal to its total cost, $C_I+C_A \equiv c$. The left side of Figure 1 also features the payments from end users to intermediaries: cardholders pay *f* to issuers and merchants pay merchant discount *m* to acquirers.

One of the features of payment systems is its two-sidedness. Whether the transactions occur within a cooperative undertaking as studied here, or through a for-profit company playing both roles of issuer and acquirer, the system must attract both sides of the market. Any contemplated increase in the merchant discount must carefully consider the likely merchant resistance, and similarly on the cardholder side.

The key feature of payment systems is antitrust conducts. As above mentioned, the issuers and the acquirers are consolidated among the 20,000 banks and Visa U.S.A. and MasterCard in order to optimal set maximal benefits of the consolidations through rejecting business agreement with a for-profit company. The consolidated issuers and acquirers have market power in the payment systems.

FIGURE 1



3. A model of the payment card industry under the antitrust conducts

Some models assume that issuers have some market power, while acquirers are perfectly competitive. (See Evans and Schmalensee (1999) and Rochet and Tirole (2002).) The cause and the extent of market power is highly country-specific. In the model below, we assume that issuers have some market power. Then we analyze the antitrust effect, also. Our model is based on the model of Rochet and Tirole's (2002). Accordingly, most of the

assumptions such as a fixed volume of transactions, normalized to one transactions, etc. are taken over. For example, C_I and C_A denote the per-transaction costs respectively, the interchange fee is denoted a, and the merchant discount is denoted m (as following Section 2). The customer's yearly fee is *f*, and it is no variable fee. Let b_B and b_S denote the customer's and the merchant's benefit.

Consumer side: Let $E(b_B \mid b_B >= b_{B*})$ denote the expected benefit enjoyed by an average cardholder, when consumers with type $b_B \geqq b_{B*}$ purchase the card, and those with type $b_B < b_{B*}$ do not.

Issuer side: Let D(*f*) denote the total demand for cards, and $\beta(f)$ the average card holder benefit.

Let $f = f^*(C_I - a)$ denote the equilibrium customer fee.

Then the important assumption goes: The oligopolistic equilibrium fee, $f^*(C_I - a)$, is defined for all values of the interchange fee *a* (even $a > C_I$) and decreases with it. Each member bank's profit increases with the interchange fee *a*.

Acquirer side: Acquirers face per-transaction cost C_A and are competitive. For interchange fee a, they offer merchant discount m given by $m = a + C_A$.

Merchant side: Merchants I = 1, 2 set their retail prices (p_1, p_2) noncooperatively as in Hotelling's model.

Timing: The timing is as follows:

Stage 1: The interchange fee is set (by collusively).

Stage2: Issuers set fees for their customers, who elect or not to have a card. Merchants decide whether to accept payment cards, and then set their retail prices.

Stage 3: Customers observe the retail prices and whether cards are accepted, and pick a store. If the selected store does not accept payment cards or if the consumer does not own a payment card, the consumer must incur his opportunity cost (b_B) of using the alternative payment method; similarly, the merchant incurs opportunity cost b_S.

Then $\hat{a}$ is the level of the interchange fee at which the net cost to the merchants is equal to the average cardholder benefit.

Last, in order to analyze how merchant resistance is affected by the diffusion of cards in the population, let us parameterize the oligopolistic equilibrium fee by a number τ that increases when competition among issuers becomes more intense: $f = f^*(C_I - a, \tau)$, with f^* decreasing in τ.

4. Re-interpretation of the model

After these preparations, Rochet and Tirole show and prove their Proposition 1, which is as follows:

Proposition 1. (i) Under the no-surcharge rule, there exists an equilibrium in which all merchants accept the card if and only if $a \leqq \hat{a}$.

(ii) As competition among issuers intensifies, merchant resistance increases, i.e., the maximal interchange fee $\hat{a}$ decreases.

A little easy way to think is the other side of the meanings. We are supposed to think the issuer as the consolidation among the acquirers. Once the issuer is thought of as composition of acquirers, then the cooperated price (customer fee; f) could be an optimal level in the payment card consumer market. There exist if and only if an optimal level of

the fee, which is the issuer=acquirer monopoly level against the consumer and the merchant. The level is higher than the Cournot (or Bertrand) competition level of the acquirers. It is easy to think that there exists the internal distributive level of the fee in the collusive system.

And if competition rises among the banks in the collusive system, the total payoff of the consolidation would decrease.

Rochet and Tirole's Proposition 2 illustrates the externalities, which describes strategic complementarity. This feature is a kind of credit card service's character The more convenient we use a credit card, the more merchants accept a credit card, and vice versa. This finding is approved in the court (including even the equilibrium of card rejection, such as "(1) Network-level costs are so high that banks and merchants cannot provide these services for themselves."[3]).

Rochet and Tirole's Proposition 3 deals with interchange fee under the no-surcharge rule[4].

[3] The Judgment: I. Relevant Markets and Market Power.

[4] Rochet and Tirole's Proposition 3: Under the no-surcharge rule, the issueres' preferred interchange fee is equal to $\hat{a}$.

The Proposition 3 means that there can be setting an optimal internal distribution level and the effects on merchant side (overprovision). Rochet and Tirole's Proposition 4 shows that issuers' perfect two-part tariffs implication. It mentions that variable payments reduce merchant resistance if and only if the interchange fee exceeds the issuer cost. And both associations and a proprietary system enhance a positive externality by using some policies. As for Rochet and Tirole's Proposition 5, they introduce information incompleteness of consumer, and show existence of social optimal interchange fee in general condition .

The other matter of interest is Rochet and Tirole's Proposition 6, it states that:

In the absence of transaction costs associated with the merchants' charging different prices,

(i) For a given interchange fee, allowing card surcharges raises the merchant price for cardholders and lowers it for noncardholders.

(ii) When the no-surcharge rule is lifted, the interchange fee is neutral and there is an underprovision of card services.

(iii) Lifting the no-surcharge rule reduces social welfare in case (i) of Provision 3. Lifting

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(i) If $C_I+C_A-b_S \leqq f^*(C_I - \hat{a})$, then the socially optimal interchange fee is equal to the issuers' preferred interchange fee.
(ii) If $C_I+C_A-b_S > f^*(C_I - \hat{a})$, interchange fee set by a payment card association controlled by issuers leads to an overprovision of payment card services.

the no-surcharge rule may increase or reduce social welfare in case (ii) of Provision 3[5].

In the antitrust conduct situation, the context means a problem of double marginalization[6]. The no-surcharge rule prohibits a merchant from conducting price discrimination as a monopolist against a consumer. If the no-surcharge rule is lifted, then the merchant who has a market power in the oligopoly situation can raise the price as long as the marginal cost equal to marginal revenue (This is above (i) description.). It cause no effect on the interchange fee which is like cost to the merchant ((ii)'s description). Then if the merchant conduct marginalization of their action, social welfare's direction depends on the situation before and after[7] ((iii)'s description).

Regarding system competition which is thought of two (or more) associations, Rochet and Tirole deliberately note that system competition may reduce social welfare by lowering the interchange fee. And they express that they only want to warn against "natural conclusions" and to stimulate further research on this very interesting topic.

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5 See footnote four.
6 See Tirole (1998), p174.
7 If the limitation is constrain rigidly, the merchant's marginalization cause dead weight loss under the merchant side monopoly. If not, the merchant's perfect discrimination may cause to raise social welfare through rising merchant's benefit.

The last thing worth to be mentioned is Rochet and Tirole's Proposition 7. Before Proposition 7, they note that a key difference between the for-profit and the cooperative paradigms is that the former has two separate instruments and optimizes over the merchant discount and the customer fee, while in the latter the customer fee is determined by issuer competition once the merchant discount/interchange fee is set. Then, Proposition 7 states that: Let m_P and m_C denote, respectively, the merchant discount chosen (directly) by a proprietary system and (indirectly) by a cooperative banks.

(i) When issuer competition is described by Hotelling model, $m_C<m_P$, under the (weak) assumption that the elasticity of merchant acceptance is small when *m* is outside the competitive region.

(ii) Linear demands, $m_C<m_P$.

(iii) When issuers compete a la Cournot and demands are linear, $m_C=m_P$.

In the antitrust context, including the for-profit entity into the model leads to leak profits to the for-profit entity. The conduct to obtain profits for for-profit entity cause to decrease m_C rather than m_P in the oligopolistic situation. It is important to consider that we compare the welfare of the competition of a proprietary system with that of the cooperative

system.

5. Comparison with the literature

The theoretical and empirical analyses of the United States' credit card market were initiated by Baxter (1983) and Ausubel (1991), similarly. Then several articles have been analyzed from the viewpoints of comparison of the ATM networks[8].

Baxter (1983) is the standard reference. Baxter assumed that perfectly competitive paradigm then performed the normative analysis of finding the optimal interchange fee.

Schmalensee (2002) made analysis of market power issues. Schmalensee considered that the interchange fee balances charges between cardholders and merchants under imperfect competition, and that economic basis for proprietary payment systems and cooperative bank card systems.

Then, Rochet and Tirole (2002) showed identification of the determinants of merchant resistance and analysis of the impact of the no-surcharge rule, as well as a comparison between the privately optimal interchange fee and the socially optimal one. In a follow-up article (Rochet and Tirole (2003)), they provide a general analysis of platform competition

[8] These are mentioned in Rochet and Tirole (2002).

and compare price structures under platform competition with those under a monopoly platform.

We have pointed out the lack of the antitrust conducts in the framework of Rochet and Tirole (2002), and show the simple re-interpretations of the credit card industry.

Another interesting topic is excess interest rates. Ausubel (1991) pointed out the interest rate of credit card market in the 1980's are sticky over the three times or five times of the financial market interest rates. This indication leads to several similar studies. Calem and Mester (1995) considered that under the high interest rate of credit card, it is necessary for consumers to take a search cost and a switching cost for the appropriate card. They pointed out that credit card issuers offer high rate to keep away consumer's adverse selection, and provided that this situation made the high interest rate of credit card ruling out perfect competition in the market. Stango (2000) confirmed that this high interest rate of credit card situation had been maintained by early 1990's and that there was non price competition between incumbents and new comers. Knittel and Stango (2003) argued that the non bounded ceiling limitation of the interest rate of credit card functioned one of focal point for the card issuers, and that the focal point made tacit collusion of the interest rate.

The situations mentioned by Ausubel and others are explained by some market power

caused by antitrust conducts of the cooperative bank card systems. Market power may be presumed if the entity controls a large enough share of the relevant market. The court stated that:

> "Indeed, despite recent increases in both networks' interchange fees, no merchant had discontinued acceptance of their cards. In addition, the court inferred market power from the defendants' large shares of a highly concentrated market: In 1999, Visa U.S.A. members accounted for approximately 47% of the dollar volume of credit and charge card transactions, while MasterCard members accounted for approximately 26%. (American Express accounted for 20%; Discover, for 6 %.)[9]"

While competition among (and within) these networks is robust at the issuing level (where 20,000 separate issuers compete to provide products to consumers), at the network level (where four major networks seek to sell their technical, infrastructure, and financial services to issuer banks) competition has been seriously damaged by the defendants' exclusionary rules. The market power is regarded as one of the main reason of the high interest rate of credit card in the 1980's and early 1990's.

[9] The Judgment; I. Relevant Markets and Market Power, Paragraph Five.

6. Summary

This article has pointed out a leitmotif of economic effect of antitrust conducts in payment card systems and studied Rochet and Tirole (2002). They state that in the absence of unobserved heterogeneity among merchants, an increase in the interchange fee increases the usage of payment cards, as long as the interchange fee does not exceed a threshold level at which merchants no longer accept payment cards. Indeed, there is this threshold in the model, but this threshold is a kind of internal optimal re-distribution point in antitrust collusion between many acquirers and association type issuers.

And Rochet and Tirole mentioned meaningful role played by merchant resistance. Payment card systems can exploit each merchant's eagerness to obtain a competitive edge over other merchants, and this searching has two benefits for systems: it forces merchants to internalize card holders' convenience benefit, and it offsets the underprovision of cards by issuers with market power. From the viewpoint of antitrust context, merchant resistance means cost of buying for acquires and issuers collusion. Therefore, if the cost is low (in the situation of a merchant has no market power and is on the competitive edge), payment card systems obtain merits from the low cost and can pass through the benefits to the consumer side. Additionally, if system competition happens, merchant resistance

(selling power[10]) would increase and the system's benefit goes down.

If the no-surcharge rule is lifted and price discrimination is costless to merchants, the interchange fee no longer affects the level of payment card services. The merchant price for cardholders is increased and that for noncardholders is decreased.

The payment card industry has received scant theoretical attention, and it will not come as a surprise to the reader that more research is warranted. This article argued that the framework developed here can be used as a building block to analyze more general situations with acquirer market power and distorted competing means of payments, including antitrust conducts in which is employed by Visa U.S.A. and MasterCard. The payment card industry offers many other fascinating topics for theoretical and empirical investigation, such as the competition between associations and proprietary, the development of e-commerce, and the comparison of world payment card systems. The respect thing is that we find out that who is decision-maker, jointly or a form of association, and we are aware of including antitrust viewpoints.

This argument can expand a broader perspective. Consider the pooling association containing the music copyrights from each musician. The association has two sided effect

[10] Using these words, contrary to "buying power."

similar to the payment card systems. It is common to get in the licensing fee of music, however if we can adopt this article's framework then the association is suspect to be an illegal under the antitrust law[11]. More generally, most markets with network externalities and industrial association involve multiple sides and the choice of price structure and antitrust problems. It can think of internet operating and keeping the security association, international banking association, media advertisers and real estate agency assessment association and so forth. What is important is real insights and recognition of positive reality.

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[11] There is the situation in Japan.

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