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PART C

**COMMENTS REGARDING “REFORM OF CREDIT CARD
SCHEMES IN AUSTRALIA II” COMMISSIONED REPORT BY
PROFESSOR MICHAEL L. KATZ (AUGUST 2001)**

by

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BIOGRAPHICAL DETAILS

Professor Dr. C. Christian von Weizsäcker holds a chair in economics at the University of Cologne and is the director of its Institute of Energy Economics. Among others he is a member of the academic advisory board to the German Economics Ministry and until recently was the head of the German Monopoly Commission. Professor von Weizsäcker has an international reputation in the fields of industrial economics and antitrust economics and has published widely on the subject.

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(MARCH 14, 2002)**

Introduction and Overview

I have been asked to comment on Michael L. Katz’ “Reform of credit card schemes in Australia II”, commissioned by the Reserve Bank of Australia (RBA) in 2001. The RBA had commissioned Professor Katz to provide an economic analysis on credit card systems and their underlying economic theory.

In my paper, I address a number of points discussed by Professor Katz and add some thoughts that I find are not addressed in the Katz paper.

For example, the models cited by Katz neglect to accommodate

- Gresham’s law and price coherence, and
- an endogenous number of competing payment systems.

I then comment on externalities and the perception that credit card acceptance is a zero-sum game between merchants. That is what competition is about in any market. But, as in any competitive market, consumers do benefit from a choice of payment schemes. The arguments put forward in the Katz paper to show that there may be excessive use of credit cards are unlikely to hold in more realistic, "richer" models of the payment process.

No-surcharge rules imposed by credit card associations determine that, in a transaction, the quoted price is the maximum price that a given customer can be charged. I argue that this rule favours customers as they

- can still benefit from a price decrease if they pay cash and
- are protected from being charged excessive surcharges in situations limited choice of payment means.

Professor Katz and some other commentators argue that credit card associations and their price setting should be regulated to improve social welfare. I am skeptical as regards the ability of regulation to improve social welfare in this area. In my opinion competition between payment systems without price regulation is likely to lead to better results.

A. The Gresham Test

Economists know Gresham's Law: bad coins drive out good coins. Traditionally, coins had a certain metallic value. If the metallic value of different exemplars of the same denomination differed, the buyer preferred to pay with a bad coin, *i.e.*, a coin of lower metallic value. He was able to do this because the seller, expecting a positive margin of price over marginal cost, preferred to accept the bad coin to a failure to strike the deal. So bad coins had a much higher velocity of circulation in the market place.

Gresham's Law is one of many empirical regularities that grow out of the general structure of routine transactions, provided that sellers are under competitive pressure: the seller is more eager than the buyer to strike the deal. Thus we say "the customer is king". If there is a choice between different means of payment, it is primarily the purchaser who makes this choice. And, within certain important limits (discussed in section F below), the price charged by the seller will be independent of the mode of payment chosen by the purchaser. Frankel calls this "price coherence".¹

To understand the competition between different payment systems, it is important to take account of this "customer is king" principle, *i.e.*, to take account of "price coherence". In evaluating models that are used to understand payment systems, it is then a useful test to ask: is the model able to generate phenomena like Gresham's Law or "price coherence". If this is not the case, one should be suspicious about the results such models generate.

I call this test the Gresham test.

As far as I can see, most of the models in modern economic literature, certainly the models discussed in Professor Katz' paper, fail to generate phenomena like Gresham's Law or price coherence.

For example, Professor Katz discusses a "neutrality result" that can be derived in certain models. The neutrality result is this: an increase in the interchange fee leads to an increase of the merchant's surcharge for this means of payment by the same amount and leads to a rebate in the same amount paid by the card issuer to the purchaser for using the card. This then means that the effective price of the good bought by the purchaser and sold by the merchant (net of card related deductions and additions) does not change at all. Thus, the change in the interchange fee has a zero effect on the allocation of resources and the distribution of income among cardholders, merchants and issuers.

Now, this neutrality result is inconsistent with Gresham's Law, which as we have seen teaches that, within a certain range of merchants service fees, merchants will not seek to recoup the cost of card acceptance (such as by adding a surcharge or offering a discount for other forms of payment). This is the phenomenon of "price coherence". But then a small change in the interchange fee within this range will not be passed on to the cardholder. Hence, the neutrality result does not apply.

¹ Frankel (1998).

I believe it is very risky to do a public interest analysis with models that are not able to generate fairly basic phenomena of real business life, like price coherence. I suggest that policy conclusions should only be based on models that are sufficiently rich so as to be able to generate “price coherence” results.

As I have developed models myself throughout my professional career as an economist, I am aware of the problems that may arise for the model builder whenever “discontinuities” in behaviour are to be described by the model. It is understandable that model builders try to avoid such discontinuities. But then sometimes they are essential for the problem at hand.

“Price coherence” generates a discontinuity in the reaction function that relates the merchant service fee of a card (as the independent variable) to the surcharge or discount of that merchant (as the dependent variable). Within a certain range of the merchant service fees the surcharge or discount is zero. At the upper end of that range the surcharge jumps to a positive (or in the case of a discount negative) value.² So there is then a discontinuity at this point.

B. More Than Two Competing Payment Systems

Most of the models discussed by Professor Katz model the competition between one card system and cash payment. But in real life there are usually several card systems and there is cash payment. Indeed, the number of competing card systems is endogenous: it has to be derived rather than assumed as exogenous.

I believe this to be an important point in the Australian context. The “Competition Benchmarks” of the Reserve Bank include the following: “competition within the market for a payment instrument, and between different payment instruments, should be open and effective”. In other words, the Reserve Bank aims for a world in which entry into the market for payment systems is open. Obviously, such a situation can only be depicted in a model if the model allows for entry and exit of payment systems, *i.e.*, if the model derives rather than assumes the number of payment systems.

For example, a particular government regulation concerning interchange fees may destroy open (four party) payment systems. Thus the effects of that regulation can only be modelled correctly if exit of a payment system is allowed for in the model. Or, a group of large merchants may decide to establish their own payment system open to all merchants in the country. Such a decision and its consequences can only be modelled if the model allows for entry of new payment systems.

Again I am aware of the difficulties of modeling entry and exit. Nevertheless such modeling appears to me to be indispensable.

² Because the merchant’s willingness to accept a card is not unrelated to the cost of acceptance and, at some level of acceptance cost, the merchant will seek to recoup this cost (such as by adding a surcharge or by offering discounts for other forms of payment) or to discourage use of the card. In other words, even Gresham’s Law and price coherence have their limits.

But even apart from the issue of entry and exit, models should work with more than two payment systems. There is a dispute about the “relevant market” of payment systems. Now, certain results [Confidential] indicate that the elasticity of substitution between credit cards and cash is as close as between credit cards and debit cards.³ Pursuing the issue of the relevant market by modeling and econometric research thus would have to include other means of payment than only cash and credit cards.

It should also be noted that models in which only one card system competes with cash implicitly model a situation in which these two systems are in the same relevant market. If Professor Katz has so much trust in the realism of results of models with only two payment systems, he should admit that those who say that all payment systems are in the same relevant market are right. It is difficult to be consistent between the belief that models with only two competing payment systems (credit cards and cash) provide realistic results, and the belief that credit cards are not in the same relevant market as cash, *i.e.*, do not compete with cash.

C. Externalities

In his analysis Professor Katz emphasizes negative externalities between competing merchants: acceptance of a card by one merchant may be due to the expectation that this increases his business. But this benefit of incremental business may be at the expense of competing merchants, so that the total benefit for all merchants may be much smaller, indeed, may be zero, if acceptance of the card does not increase the sum total of all purchases.

It should be added that this is not the end of the story. As Professor Katz is of course aware (but does not emphasize), the reason that a merchant can draw additional business from his competitors by accepting a card is that purchasers benefit from using the card. The merchant who accepts a card that is the preferred means of payment of a purchaser provides a positive externality to this customer. If every merchant accepts a particular card it may be true that the sum total of merchants’ benefits from this card is zero. Yet the sum total of benefits for all holders of this card obviously is positive. The real question then is this: are the costs associated with running this card system larger or smaller than the benefits derived from the card system by all card holders? If, in addition, the sum total of benefits for merchants is not zero but positive, then this sum would also be added to the consumer benefits.

It is the very nature of competition that one supplier imposes a negative externality on his competitors by improving his service to his customers. Take the following example: opening hours of shops. If a law is passed or a cartel is formed to reduce the weekly opening hours of shops, this may have little impact on total sales of shops. Customers adapt and do their shopping at the time the shops they want to buy from are open. If the law is then rescinded, the first shops increasing their opening hours will win additional business away from the other shops. This is an indication that consumer benefit has increased, even if total expenditures of consumers in shops have not increased. But shopping convenience has increased for the customers of the shop with longer hours. Under competitive conditions we then expect most shops to increase their

³ Annexure A [Confidential] to the MasterCard submission of March 15, 2002 to the RBA.

shopping hours, thereby providing additional shopping convenience for their customers. Yet total shopping volume may not have changed at all. Nevertheless, in economic terms, society benefits.

I see no fundamental difference between shopping hours and acceptance of payment systems. We may, of course, ask for a more detailed proof that liberalized shopping hours are a better regime than regulated shopping hours. It may be possible to develop a set of assumptions for a model such that an "ideal, fully informed regulator" of shopping hours is able to do better than a market with unregulated shopping hours. But, even if such assumptions about consumer behaviour were realistic (which I would doubt), it is very unrealistic to assume that we can find the "ideal, fully informed regulator".

D. The Issue of Cash-Payers' Disadvantages: General Considerations

The models discussed by Professor Katz do not have a detailed description of the way different payment systems are being used. The hypothesis that cash payers are disadvantaged by an excessive use of credit cards is investigated by means of models that essentially depict a situation in which two payment systems are being used and in a sense compete with each other. Basically, Professor Katz starts the investigation with the implicit or explicit assumption that the goods bought by the purchasers are invariant against the use of the payment system.

This approach ignores the technological details of the different payment systems. One of the reasons that different payment systems co-exist is that they rely on different technologies and therefore have different comparative advantages. Cash traditionally was used without the support of a telecommunication network. Modern card systems are based on such support. The ability to accept a credit card with such a high degree of reliance is to a large extent due to the possibility of confirming the authenticity and credit worthiness of the cardholder at the point of sale by means of a fast computer network that responds to queries within fractions of a second.

But this must have a substantial impact on the composition of the commodity basket that purchasers purchase. I do not think it needs detailed proof if I claim that merchants, like hotels, restaurants, tourist shops, etc., are able to attract substantially higher custom from purchasers due to the existence of "plastic money". Not only has travelling become more convenient due to electronically based payment systems, but also liquidity constraints that traditionally arose far away from home can be overcome today by the use of cards that are parts of a system with an electronic communication network. The greater convenience of travelling as such and the greater convenience of purchasing goods while travelling must have increased travel-related expenditure. Spontaneous exploitation of purchasing opportunities while travelling has become so much easier than used to be the case that this must have had a substantial impact on travel-related expenditures. All this is ignored in the formal models discussed by Professor Katz.

Obviously, with limited budgets, greater travel-related expenditures will be incurred at the expense of other expenditures. So it is plausible that demand for goods that are not travel-related is lower than it would be if card-based payment systems did not exist. But this change in

expenditure patterns is due to technical progress. It therefore can be seen as an effect which raises the standard of living of the representative consumer and therefore benefits society overall.

Changes that raise average real income can be accompanied by effects that are detrimental to a part of the population. The classical example of this is free trade. Abolition of import duties on cereals in 19th century Britain raised the standard of living of the average citizen, but it may also have lowered the real income of parts of the agricultural population. Yet, mainstream economics then as now advocates free trade as welfare enhancing economic policy. By analogy, technical advances in the field of payment systems would be considered welfare enhancing even if it cannot be shown that there is nobody who is hurt by the increased exploitation of these technical advances.

E. The Issue of Cash Payers' Disadvantages: Specific distortions: The No-Surcharge Rule

Professor Katz devotes a substantial part of his paper to the issue of no-surcharge rules. Here some of the criticism of such rules is based on the contention that they may increase prices for cash payers. But again, the models on which Professor Katz bases his evaluation of no-surcharge rules are not rich enough to capture the reasons put forward by those who argue in favour of allowing no-surcharge rules. Not long after the time the Katz paper was completed (August 2001) three American economists won the Nobel Prize in Economics for their pioneering work on markets characterised by incomplete information. And indeed, incomplete information of market participants is one of the most universal phenomena in real life. The complexity of daily decision making leads people to work with simplified assumptions and "models" in their mind that are much simpler than the reality they are supposed to depict. Some economists here speak of "bounded rationality", to use a term by Herbert Simon.

If a card organisation like MasterCard wants to succeed, it needs to carefully manage its brand and develop its brand recognition. Brands are important as guides for the consumer who normally is not well informed and does not want to spend the time to become fully informed before making a purchasing decision. Brands are an important institution to simplify consumers' lives.

Now, if purchasers experience that merchants surcharge them when they use a particular card, they may feel they are being cheated by the merchant and by the card organisation because they have to pay more than they expected to pay. They will be angry and will dissociate themselves emotionally from the brand of this card organisation. Advertising the brand then becomes much more difficult. It is quite understandable that card organisations try to maintain their freedom to negotiate no-surcharge rules. I believe only a model that copes with these behavioural characteristics is appropriate in evaluating the proposed prohibition of no-surcharge rules.

What can be shown in models of the simple kind Katz discusses is the following "Neutrality Result No. 2": if merchants who are contractually bound to observe a no-surcharge rule are nevertheless allowed to offer discounts as a function of the means of payment, then in this model world of fully rational consumers the outcome is exactly the same as if there were no no-surcharge rule. The highest price is the "list price", all other effective prices are lower due to

discounts; and this is equivalent to a “list price” which is the lowest and all other payment means are surcharged.

So all the results Katz discusses to criticise no-surcharge rules are only valid if there is also a “no-discounting” rule. If discounting is allowed, a no-surcharge rule cannot have the negative results which Katz deduces. And, to my knowledge, card systems like MasterCard do not try to inhibit merchants’ discounting. For the reasons of customer emotions and “bounded rationality” the results of a prohibition of a no-surcharge rule may make a difference, even if discounting is allowed. This is then the reason that card organisations may want to keep the no-surcharge rules. Card organisations may be of the opinion that the world looks slightly different from the way it is described in models of the kind Katz discusses. But this difference in brand building, etc., *prima facie* has no anticompetitive effects and is likely to have positive welfare effects.

F. The Issue of Cash-Payers’ Disadvantages: Specific distortions II: What is a Distortion?

Given that discounts are allowed and given the “neutrality result No. 2” just derived, I do not intend to analyse no-surcharge rules in detail. But even if the government were to prohibit no-surcharge rules, price coherence (see section A above) will, within a certain range of merchant fees for card use, imply that card-users and cash-payers pay the same price. Thus the question arises: can there be a distortion to the disadvantage of cash-payers even without no-surcharge rules?

This question raises the further question: what is a distortion? Professor Katz uses the criterion of externalities to talk about distortions within the class of models he discusses. But externalities are everywhere. It is a mistake to design an economic policy according to the general criterion of avoiding externalities since such an approach is bound to fail. Government is simply incapable of internalising all externalities. This is partly – and in quantitative terms more importantly – due to the fact that government has to act, as everybody, under vastly incomplete information and along the procedures of government decision-making with all this lobbying of special interest groups. But it is partly also due to a basic impossibility theorem: assume – realistically – that doubling every resource in the economy, including people and land, implies a higher standard of living, so that there are economies of scale at the macroeconomic level. Then marginal productivity remuneration of every resource would add up to more than total product (Euler’s theorem). Thus on average resources get paid less than their marginal contribution to national income. This then, by necessity, implies positive externalities.

But then the theory of the Second Best shows us that it is not necessarily productive to try to internalise one particular externality, if “neighbouring” externalities remain un-internalised. Total welfare may decline, if one tries to internalise one particular externality without regard to the externality environment of the situation at hand. A well known example for such a phenomenon is environmental policy. It is the example Katz also uses. Imagine certain products can either be made of raw material A (leather for example) or of raw material B (plastic for example). Production of both raw materials creates pollution, but production of B creates twice as much pollution as production of A. Now the government is able by decree to change the production process of A so that pollution can be avoided. But the cost of production is now

higher. This is what we call the internalisation of an externality. But for whatever reasons such an internalisation is not possible with raw material B. If now the government orders A to be produced without pollution, A will be more expensive on the market and A will be substituted by B which causes more pollution than did A before.

So let us be more modest as regulators! We may unintentionally cause more harm than good because we disregarded the complexity of the situation. And we may fall prey to vested interests which as a rule fight for anticompetitive government regulation.

In my opinion, wherever possible, it is more productive to pursue a somewhat more agnostic economic policy approach. We should learn from market developments. In a particular policy area we may look at analogous situations where we would tend to leave market developments alone, because we don't believe we have a good recipe for a government intervention to improve things. I want to follow this approach here.

In particular, I want to investigate phenomena related to Gresham's Law and price coherence. There is a close analogy in business-to-business transactions. Here payment normally is made by check or bank transfer upon receipt of an invoice from the supplier. What we observe is that within a substantial time range it is at the discretion of the customer when to pay the bill. Some customers wait a much longer time before they pay than others. They may have their specific motives either to pay up soon or to pay after a substantial delay. The latter policy may save liquidity, at least in the short run. Certain customers have no choice, due to liquidity constraints to wait a long time before they pay. The former policy of paying soon may be motivated by the wish to obtain a reputation as a good customer, well equipped with liquidity and therefore a customer for the long run, worth being particularly attended to. Or it may, occasionally, be motivated by the wish to help the supplier with his liquidity or to express thanks for good quality service.

The result of this diversity of time of payment is that effectively different customers pay different prices – even though on the face of it they may pay the same price. People who pay later save interest. Obviously, the supplier may charge late payment compensation, but within a large time range, most suppliers do not do so: again, price coherence or what is the same: “the customer is king”.

Now, does it make sense for government to intervene on behalf of early payers? After all, if every person would pay early, the price of the good could be lower. Hence, early payers may in effect pay more due to the fact that others pay late. Nevertheless, terms of payment should be negotiated between buyers and sellers. The government obviously comes in by regulating procedures by which a supplier may obtain payment from a customer who refuses to pay. But beyond that it does not make sense to intervene on behalf of suppliers to speed up payment. On efficiency grounds it is likely that markets have adapted to practices as they have existed for a long time. If early payment is important for the supplier he will have installed rebates for early payers; but experience shows that not every supplier does this. It is likely that there are good reasons for not doing so. And on equity grounds? The distribution effects of any given payment behaviour are so diffuse that it would obviously be foolish for the government to start micromanaging payment terms.

Is there an important difference between the issue of payment terms in business-to-business transactions as just described and choice of payment mode by purchasers? The only difference which may be of importance is the existence of network – effects in the latter case. We therefore now have to turn to those.

G. The Network Effects of Payment Systems

I agree with Professor Katz that network effects are an important part of the structure that we have to analyze. They are, of course, intrinsic to every payment system. They also are present with the cash payment system. The merchant accepts cash because he knows that banks and others accept cash. The customer of the merchants carries cash and accepts cash for payment, because she knows that merchants accept cash. The currency of a small and distant country may not be accepted or only be accepted at a substantial discount, because it can only be used as cash elsewhere, *i.e.*, it lacks for the most part the acceptance network that the domestic currency enjoys.

In OECD countries there is now a variety of payment systems that compete with each other. Competition enforces greater efficiency of operations. As with other competing goods, it is also here the case that the optimum volume of consumption of the good is obtained at the point where its marginal utility (measured in units so that marginal utility of money is equal to unity) equals its marginal costs. But this statement may have somewhat different implications here than in other markets, given that we are dealing with payment services which are, of course, forms of money.

If a merchant agrees to accept a specific card and if the cost of performing all payments in the economy thereby does not rise, then the situation in the economy has improved. The choice set of the cardholders of that card has been raised without a cost to the economy. If total costs of payment systems do not change much with higher acceptance rates of existing payment systems, a higher average acceptance rate of payment systems by merchants has to be preferred socially to a lower average acceptance rate.

Despite the fact that cost/benefit analysis of the kind performed in the models discussed by Professor Katz would indicate so, it would be foolish to conclude from this observation that government should impose pressure on merchants to accept existing payment systems. On the other hand the observation should also make us hesitate to accept proposals that would have the effect of lowering acceptance rates of existing payment systems.

This observation should also make us aware of the fundamental importance of the distinction between two levels of decision making by purchasers and by merchants. On one level (level I) the purchaser has to decide which mode of payment to use for a particular purchase. She is limited to those payment systems of which she is cardholder and, of those, to those cards that are accepted by the merchant she buys from. On a higher level (level II) she has to decide which cards to hold. Similarly, the merchant has to make level II decisions: which payment systems to

accept. On level I, it is mainly his customers who decide which payment system to use.⁴ This distinction between the two levels of decisions is rarely made in the Katz paper and in the papers that he discusses. Yet it is important.

It seems empirically to be the case that the social marginal cost of holding an additional card by a purchaser is very low and that the social marginal cost of a merchant accepting an additional card is very low. But then welfare is higher with high levels of acceptance by purchasers and merchants than with low levels. In other words: in a world in which the main cost drivers of payment systems are the actual transactions performed with these payment systems, it is a good thing that available payment systems are accepted widely.

Holding a card is an option to use the card wherever it is accepted. A widespread acceptance of payment systems implies that there are plenty of options for consumers which payment system to use. If this high option value can be had at a low social cost it is to be socially preferred to have these options rather than not to have them.

If there were no price coherence (no Gresham's Law) and if each payment system were self-supporting then it is difficult to see how a problem of excessive use of a payment system could arise. Indeed, as in the case of the "neutrality result" discussed by Professor Katz, the surcharge of any payment system would be a reflection of its costs and thus goods purchased with any given payment system reflect the cost of that payment system.

Thus we can conclude that, in a world in which level II costs of payment systems are negligible, high acceptance rates of payment systems are welcome. A risk of excessive acceptance does not arise. Absent no-surcharge limitations and absent price coherence there is also no problem of excessive use of any given payment system that covers its costs. Its costs will be reflected in the prices of goods paid by means of that payment system.

H. Effects of "The Customer is King"

The real world looks somewhat different: for sufficiently small differences in merchant costs of accepting different payment systems the merchant does not pass these differences through to his customers. It is an empirical question how large is this range of cost differences with uniform prices. Let me call this range the "coherence range". The market outcome will of course depend on the size of this coherence range.

Before we proceed further we should note that even with "price coherence" the result derived in the last section still holds: "In a world in which level II costs of payment systems are negligible, high acceptance rates of payment systems are welcome. A risk of excessive acceptance does not arise". Therefore, government measures that may be detrimental to card acceptance by merchants or cardholders must be considered detrimental.

⁴ We should note, again, that this is only strictly correct within certain limits, and that merchants always have the option of setting the payment terms (*e.g.*, charging a surcharge or offering a discount) and the ability to influence the purchaser's choice of payment method (*e.g.*, promoting certain cards as being "preferred", asking for a different card).

But "the customer is king" world will exhibit a particular form of price competition among payment systems.

If, as is the case in developed countries, the costs of payment systems and the size of their market are such that a good number of payment systems can be sustained, then we expect that most purchasers have no interest to be part of all available payment systems. The option value of an incremental payment system is small for the representative purchaser: she already has enough options with, say, one or two credit cards, one or two debit cards and cash for her transactions. Among credit cards in particular she will be attracted by those that promise wide acceptance and – among those with wide acceptance – those with low or no transaction-based fees and low annual fees. Purchasers are highly selective in their choice of payment systems, and therefore price competition among payment systems for cardholders is fierce.

This is different with merchants: even if there are many payment systems around they will find it in their best interest to accept quite a few of them. Given that purchasers effectively decide which payment method to use in any transaction, merchants are interested in offering their customers a large portfolio of payment methods to choose from. As a general tendency we can say: if we look at different credit card systems X, Y and Z, for the purchaser it is either X or Y or Z; for the merchant it is X as well as Y as well as Z. Therefore, merchants are more willing than cardholders to pay for credit card services. Under competitive conditions, we therefore expect a large part of the cost of payment systems to be covered by revenue from merchants rather than purchasers.

Decisions taken by purchasers and merchants about the number of payment systems are interdependent. If the annual fee and the transaction fee of purchasers is driven down by competition, then the number of payment systems of which the representative purchaser becomes a member rises. The more cards the purchaser carries around the lower is the pressure on merchants to accept additional payment systems, since the purchaser with many cards is more likely to hold a card which the merchant accepts even if the merchant does not accept all cards.

We therefore expect a particular dynamic of price competition in the payment systems industry. Prices paid by cardholders are competed down. This leads to an increase in the number of cards that purchasers have. Thereby merchants can become more selective in the choice of cards which they accept. This then leads to increased price competition among payment systems in the merchant business. Obviously, as in every industry, the competitive downward pressure of prices finds an end at the level of the marginal costs of the payment system.

Price competition of payment systems for merchants is enhanced by the fact that surcharges and cash discounts, etc., are possible. From the point of view of the payments system, surcharging and discounting by many merchants is to be avoided. The attractiveness of cards among cardholders is negatively affected by widespread surcharging and discounting. Therefore the risk of increased surcharging and discounting after an increase of fees is one of the most powerful forces to keep merchant fees low. We would expect that actual surcharging and discounting is rather infrequent because payment systems have a great interest in avoiding this in

their systems. But nevertheless, merchants' right to surcharge or discount imposes substantial downward pressure on merchant fees.

Let me emphasize the causal link between the price competition of payment systems on the cardholder side and on the merchant side. If payment systems were forced by government decree to raise the proportion of revenue obtained from cardholders, this would then mean that price competition on the cardholder side would suffer. But higher prices for cardholders imply a reduction of the average number of cards purchasers hold. Then it will be more difficult for merchants to avoid acceptance of any given payment system, because the number of purchasers who cannot and will not shift their mode of payment is now higher. This declining choice for merchants could lead to higher merchant fees. If the intention of the government were to reduce the costs to merchants, such a government decree might turn out to be counterproductive.

I. Diversity of Payment Systems

Competition between payment systems is a competition between heterogeneous goods. There is no theorem in economic theory, which says that competition between heterogeneous goods leads to the socially optimal level of diversity. Therefore we would not expect such a result in the case of payment systems. The question was not addressed in the Katz paper. The concept of an optimal degree of diversity or variety of products in the market for payment systems is too complicated a concept to be of any use for government policy. So one should be cautious in making any pronouncements in this respect.

But I bring this issue up to alert the reader to the interdependence between the intensity of use of any given payment system and the number of payment systems on the market. There is obviously an inverse relation between the number of payment systems on the market and the intensity of use of any given system. If we speak of an "excessive use" of any given system we may mean to say that it is used at the expense of another existing system. But measures to curtail the use of any given system may induce a greater variety of payment systems rather than simply shift usage to another existing system. And we may not at all be sure whether we really want this increased variety, given that the total costs of payment systems are likely to go up with increasing variety.

For example, regulating interchange fees without a realistic view of the consequences of such regulation may lead to the demise of open systems. By market entry they are likely to be replaced by closed (three party) systems which are not exposed to interchange fee regulation. These closed systems may be more expensive for the economy because their acquisition cost of merchants and cardholders are likely to be higher: they do not, like the banks in open systems, have a "natural" base of potential customers which the banks have among their banking customers. The end result could be more expensive payment systems for the economy.

J. The Interchange Fee: Is it a Restriction of Competition?

The reason that, as compared to closed systems, open systems are under so much more intensive scrutiny by regulators is due to the idea that interchange fees are a restriction of competition, *i.e.*, that they are a kind of price fixing. Even though Katz does not discuss this issue, he also pronounces ideas about the appropriate regulation of interchange fees. It is therefore worthwhile to ask: is the interchange fee a price fixing arrangement?

In section H we derived that a large part of the revenue of a competitive credit card system will come from merchants. The services a payment system provides on the occasion of its use in any particular transaction are two linked services: one to the purchaser, the other to the merchant. These two services on the transaction level are a joint product, two products produced in strict complementarity. As we know from economics, it is not possible to isolate the separate costs of two outputs which are of necessity produced in fixed proportions. Therefore it would be a mistake to try to decompose the set of all activities of the operator into 1) the set of those activities of the operator that create costs for the service to the purchaser and 2) the set of those activities that create a service to the merchant.

For example, it would be a mistake to say that activities involved in charging the purchaser's account are a service to the purchaser and activities involved in crediting the seller account are a service to the seller. If, for example, a credit card system provides the seller with a payment guarantee, then a default of the purchaser to honour her obligations to the payments system will cause administrative costs to the system at the cardholder's end, yet the service of guaranteeing payment (although fundamentally a service to both seller and purchaser) is clearly of great benefit to the seller.

That the costs of two jointly provided services cannot be separated is a very simple and elementary point, which is well understood in economics. There cannot really be a dispute about this proposition among serious people in the economics profession.

Now in a four party credit card system the joint service basically is provided by the system, just like in a three-party system. But the activities involved in providing these services are located in specific parts of the system, in particular, in the bank of the cardholder and the bank of the merchant. Also, the costs associated with these activities are borne by the two banks performing these activities. There is no reason to expect that the revenue generated in the form of service fees charged by each bank involved is closely related to the costs borne by those banks. Indeed, as I showed in section H above, under competitive conditions we expect a large part of the fee revenue to be generated from the merchant and therefore obtained by the bank of the merchant. But the costs borne by the merchant's bank had no place in the argument why a large part of the revenue would be generated by the merchant's bank.

As it happens, the activities of the cardholder's bank tend to be more costly than the activities of the merchant's bank. For example, the issuing bank bears the cost of the payment guarantee, *i.e.*, the costs of default and fraud, as well as of the interest-free period. The issuing bank also has larger administrative and processing costs than the acquiring bank: the turnover effected by a credit card system spreads over many million cardholder customers and only over a number of

merchants which – as indicated by research on the United Kingdom – may be in the order of 100 times lower.

So it turns out that a four party credit card system under competitive pressure can only work if reimbursements of some of the costs of issuing banks occur out of the fees obtained by the merchants' banks from their merchants.

One might imagine that such reimbursements can be agreed upon by a network of bilateral agreements between all the banks involved. But it is easy to see why such set-up could not work. Indeed, assume that, by government intervention, multilateral fallback interchange fees are abolished and any pre-existing bilateral interchange fee agreements are annulled. So now banks have to find new bilateral agreements to replace the abolished and annulled interchange fees. Let MIF be the rate of the abolished multilateral fallback interchange fee. Each issuing bank is free to announce that it will now deduct a different rate R from the payments to be made upon the use of the cards it has issued.

Will we find an issuing bank that will announce a value R lower than MIF? This is very unlikely. Given that so far the system has worked well with the rate MIF, what advantage can an issuing bank see in a lower fee? If it announces that R is equal to MIF everything will be as before including the issuing bank's fee revenue. If it announces that R is now lower than MIF nothing will change for the rest of the system. The frequency of card use of the issuing bank will remain the same, because its customers, the cardholders, are not even aware of the new interchange fee R . The only difference is that the issuing bank now has lower income from the interchange fees.

In fact, merchants are likely to pay more under conditions in which interchange fees are set "bilaterally" (*i.e.*, without reference to any multilateral fallback interchange fee whatsoever). This is for the following reason: first, it is likely that interchange fee levels in such a context will be determined by issuers, rather than by acquirers, since interchange fees represent a reduction in the amount of funds sent by the issuer to the acquirer in connection with the sales transaction. In deciding what interchange fee level to set for its transactions, each issuer will go through a similar analysis. They presumably would have some idea of what an appropriate multilateral interchange fee would be (based initially on the abolished MIF and later on for example, the MIFs in neighbouring countries) and they would understand that this level would be best for the system's business prospects in competition with other systems. However, each would be concerned that other issuers, who are its competitors, would set their fees above this level, thereby gaining a competitive edge. In order to protect themselves from this, each issuer would feel compelled to ask somewhat more than the perceived appropriate level. Hence, the average interchange fee of the system would almost certainly be higher than the appropriate fee level.

While the difference might be small in the first round, since each issuer would understand that asking for an excessively high interchange fee would be harmful to the system's business and therefore counter to its own interests, over time, the same line of analysis as just set forth would likely lead to the system's average interchange fee increasing, and to the cost to merchants for accepting the system's cards increasing relative to the cost of accepting other payment products (or at least other payment products that do not need to set interchange fees, such as the products of three-party systems and, of course, cash). Eventually, the system would become

uncompetitive and would go into decline. At this point, major participants in the scheme (*i.e.*, those with healthy issuing and acquiring businesses) would likely break away and establish their own, separate three-party payment programs, thus avoiding the problems associated with bilaterally set interchange fees.

So a mutual understanding about the appropriate level of the reimbursement of issuing banks has to be achieved in order to protect acquiring banks from unduly high interchange fees and merchants from unduly high service fees. Thus, in contradistinction to the conclusion of Professor Katz, it is fairer to say that multilateral fallback interchange fees are the means by which four party payment systems protects merchants against unduly high merchant fees.

Obviously such a fallback interchange fee is also in the interest of maintaining the payment system and thus in the interest of the participating banks. As bilaterally set interchange fees continue to rise, more and more merchants will leave the system and no longer accept its (*i.e.*, its issuers') cards. Eventually, the payment system will become uncompetitive and will be replaced by others, for example, those organized by the merchants themselves or independent three-party systems like American Express.

Even if we assume that without a multilateral fallback interchange fee a four party system would be stable, a fallback interchange fee would facilitate expansion of a four party system by ensuring that new members (issuers and acquirers) are not discriminated against by existing members. Since the entry of new members into a four party scheme can enhance intra-system competition, this is another reason why cardholder and merchant prices are likely to be lower in systems that do not rely exclusively on bilaterally negotiated interchange fees.

It is therefore a mistake to interpret the interchange fee as a price fixing agreement designed to raise prices above the competitive level. A cardholder's bank receiving the interchange fee has no incentive to deviate from that price by agreeing to a lower price in order to obtain more business. Only if this were the case would we be in a situation similar to a price cartel. There it is the case that a supplier has an incentive to undercut a supra-competitive price in order to obtain more business and thereby increase his profits. But here? How could a cardholders' bank generate more business in the form of fee payments from merchant's banks by agreeing to lower the unit price of such fee payment? The cardholder, who is the customer of the cardholder's bank decides whether to use the card for payment at a merchant. The cardholder is not even aware of the payments between the merchant's bank and his bank. How can her decision to use the credit card be influenced by the size of that interchange payment?

So we come to the conclusion that a fallback interchange fee is indispensable for the working of a four party credit card system and that a multilateral agreement to install such a fee is not a price fixing cartel.

K. Is it Advisable to Regulate the Interchange Fee by Government?

Professor Katz seems to be of the opinion that government regulation of the interchange fee is advisable. The regulator would try to ascertain "legitimate" costs and set a maximum

interchange fees accordingly or, alternatively, determine the “best” formula for setting interchange fee and require all four party systems to use the formula.

In my opinion such a government regulation is not the optimum arrangement. Government is not in a position to find the socially optimal level of the fallback interchange fee. Given that there is competition between payment systems and that markets are dynamic, not static, it is not at all clear that the current costs of operation of the system are a good guideline for the interchange fee. A system that wishes to expand may need to increase interchange fees to encourage issuers to invest more in the system (*e.g.*, offer better services to cardholders, invest in new technology, offer a better payment guarantee to merchants), or it may need to lower interchange fees to encourage wider acceptance or greater merchant investment in the system (*e.g.*, the deployment of new point of sale technology). Given that we have derived in section G and H that increased acceptance of the system is socially beneficial it could be a big mistake to prevent the system from growing by not allowing certain issuers’ expenses to be covered by the interchange fee.

On the other hand, there are substantial market constraints against excessive interchange fees. The system management will see to it that the interchange fee does not trigger large scale surcharging of the payment system, because such surcharging (or discounting of competing systems) would substantially reduce the use of the system by its cardholders, and would therefore not be profitable. The merchants have other means to influence their customers card use: in many cases the relation between merchant and supplier is much closer than the relation of either to their banks. There are many opportunities other than discounting to influence the customer. Moreover large merchants and their organisations can always enter the market for payment systems, given their starting advantage of enlisting merchants and approaching their regular customers.

Given all this I find it highly implausible that a government regulator of interchange fees can do better for the public interest than the competition between payment systems which we observe in the real world.

Conclusion

Due to the rule that “the customer is king” and price coherence, the Gresham Test is essential to the understanding of credit card networks. Economic models of credit card systems that are not able to pass the Gresham Test have only limited explanatory value. To my understanding none of the models discussed by Katz would be able to pass the Gresham Test.

I also show that customers benefit from no-surcharge-rules as they do not experience the negative surprise of price increases at the cashier once they have disclosed they are paying by credit card. In addition, I show that no-surcharge-rules prevent merchants from taking advantage of customers in situations in which they need to pay by card credit.

The theory of the Second-Best should make us cautious as regards government intervention whenever there arises a presumed market imperfection. For a given market imperfection, the net social benefit of a regulated industry might be lower than the net social benefit of an unregulated industry it despite its imperfections. A review of the credit card industry should not stop with the

analysis of the market imperfections but should continue with an analysis of the potential market outcome of regulation. Such analysis must be based on "richer" models than those discussed by Katz.

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