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Annexure A

C. Christian von Weizsäcker, “Economics of Credit Cards - Expert Report on behalf of MasterCard International Incorporated and Europay International SA” dated 23 January 2002

C. Christian von Weizsäcker

Economics of Credit Cards

Expert report on behalf of MasterCard International Incorporated and Europay International SA

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[For Public Release]

INTRODUCTION

I have been asked to give my views on certain fundamental aspects of four-party credit card systems. In particular, I have been asked to consider:

- the nature of the interactions of cardholders, merchants and four-party payment service providers (issuers and acquirers) in an advanced economy such as that of the U.K.,
- the extent to which various forms of payment are substitutable for each other, and the proper definition of the product market within which four-party credit cards compete,
- the extent to which the U.K. payments market can be said to be competitive such that four-party credit card issuers are constrained not to set fall back interchange fees at supra-competitive levels,
- whether and to what extent one would expect merchants to pay a portion of the cost of operating four-party credit card systems in a competitive payments market,
- whether fall back interchange fees are necessary for the existence of four-party payment systems,
- whether merchants' costs would likely be higher or lower were fall back interchange fees set bilaterally without a multilaterally set fallback rate,
- whether or not four-party credit card systems are a benefit to society,
- whether society would be better off if four-party payment systems were replaced by three-party payment systems,
- whether fall back interchange fees harm consumers who pay with cash.

In preparing this paper, I have relied upon the results of a consumer preference study [confidential].

My report is structured in ten sections as follows:

A Payments Systems and the Contractual Framework of High Frequency Transactions

B Asymmetry: "Sales Transaction Hungry" Merchants vs "Sales Transaction Saturated"

A Payment Systems and the Contractual Framework of High Frequency Transactions

1) Every day many millions of transactions take place in the modern economy. Most of these transactions can be classified into broad categories so that within each category many relevant characteristics of the transactions are identical. For most of these broad categories it is also the case that every person involved in such transaction performs a transaction of this category quite often, perhaps several times a day, perhaps several times a week, perhaps several times within a month. Buying groceries is a transaction which occurs several times a month at least for every person involved. Buying petrol at the petrol station similarly has to be done by most car drivers several times a month. I call transactions of this type high frequency transactions or routine transactions.

2) Contrary to the textbook model of transactions most of these high frequency or routine transactions take place within a framework of longer term contractual arrangements between the two parties of the routine transaction or between other parties which are themselves connected to the parties of the routine transaction by a longer term contractual framework. In this latter case the two parties of the routine transaction are indirectly linked by a "chain" of longer-term contractual frameworks.

3) Thus, for example, a manufacturer and a trader usually have a longer-term contractual relationship which serves as a framework for their daily transactions for delivery of product and payment. This framework contract regulates modes of delivery and terms of payment. It may even determine the price or the rebating schedule for the good to be delivered: if not the price itself the framework normally determines a formula by which one can arrive at the price. The framework contract may also specify an approximate annual volume of deliveries, as well as other things, for example, product quality.

4) Within this contractual framework the buyer (not the seller) has the right to decide about the daily volume of delivery. The seller is obliged by the contractual framework to deliver these quantities, as long as certain upper limits are not exceeded.

5) Similarly, a contractual framework between a bank and a business obtaining short-term credit from the bank regulates the daily transactions between the bank and the business. The business may have a line of credit which it can use in the form of an

overdraft on its account with the bank. Daily inflows and outflows on this account can then occur without further negotiations. The framework specifies the "price", in this case the rate of interest to be paid for debit balances.

6) A payment system – other than the cash payment system – also provides a contractual framework for high-frequency transactions. When a purchaser pays the seller with a credit card, the seller is assured that he will be paid even though he may not even have known the purchaser before the transaction. This is made possible by the contractual framework between the banks of the two parties to the sales transaction and these parties themselves. In a four-party credit card payment system like MasterCard four contractual frameworks are involved: 1. the contract between the purchaser in this transaction (the cardholder) and her bank, 2. the contract between the seller in this transaction (the merchant) and his bank, 3. the membership arrangement of the bank of the cardholder and the payment system organisation, and 4. the membership arrangement of the bank of the merchant and the payment system organisation.

7) But also cash payment presupposes a framework. In modern times this framework is of the nature of government regulation concerning the issuance of bank notes and coins.

8) The contractual frameworks are a means by which the transaction costs of routine transactions can be substantially reduced. The buyer of manufactured goods thereby is assured of delivery of these goods without having to spend time and money every day on the negotiation of the prices of the goods. By the credit line of its bank the business is assured of its ability to pay its bills in time without having to negotiate financing of payments every day with a potential creditor. The purchaser of goods or services to be paid by credit card does not have to waste time to assure the seller of her creditworthiness.

9) Transaction costs can be saved by means of contractual frameworks because routine transactions have similar patterns. It is therefore only necessary to agree once on certain terms and conditions which conveniently can be copied from one routine transaction to the next one.

10) As we want to discuss the demand for the services provided by credit cards, it is then useful to distinguish between the demand for credit card services on the level of

routine transactions and the demand for credit card services on the level of the contractual framework. (What we say about the nature of demand for credit cards applies fundamentally to store cards, charge cards and debit cards as well.) For purposes of abbreviation, I call the level of routine transactions the level I and the level of the contractual framework the level II. We then can speak of level I demand and level II demand.

11) In addition we have to distinguish between the demand for credit card services by the purchaser of goods (the cardholder) and the demand for credit card services by the seller of goods (the "merchant"). On the framework level II demand H* for credit cards by potential cardholders is a different quantity from demand M* by merchants. M* is the number of merchants accepting the card, and H* is the number of persons who hold the card. On the routine transaction level I demand for the card service by cardholders H and demand for the card service by merchants M are the same quantity expressed in money terms. For, a payment effected by the card generally has the same money value for the payer (the purchaser) as for the payee (the seller). Hence H = M. Note that H and M are equivalent in both money terms and in terms of the number of transactions.

12) So we have three (algebraically) independent demands for the card service: H* and M* on level II and one joint demand H=M on level I. But, even though they are algebraically independent, they influence each other. If purchasers knew that they would never use the card for payment then their demand for the card on level II would be zero. But, if that person is a cardholder, the frequency with which she uses the card remains to be determined. On the other hand, if the seller does not accept the card, the cardholder is not able to demand the services of the card on level I. But, if a merchant accepts the card, the frequency with which payment at the merchant is made by means of the card remains to be determined.

13) Let us note the following: the decision whether to accept the card (at level II) is made by the merchant in light of the availability and terms offered by competing card systems and alternative methods of payment as well as the likely use of purchasers. The decision whether to carry the card (at level II) is made by the purchaser in light of the terms offered by competing card systems as well as their level of acceptance among merchants. The decision whether to use the card (at level I) is made by the

cardholder, i.e. the purchaser – if the merchant is a customer of the payment system on level II. In other words: once demand H* and M* are determined, in the context of competing card schemes and other methods of payment, and recognising, and discussed below, that merchants can influence cardholders' decisions as to which payment system or means of payment to use, it is then mainly H which determines M and not the other way round. It is important to understand why this is so. For this purpose it is necessary to analyse the general structure of high frequency or routine transactions in the modern economy.

B Asymmetry: "Sales Transaction Hungry" Merchants vs "Sales Transaction Saturated" Purchasers

14) The typical routine, high frequency purchasing transaction in the modern economy has a particular pattern: the supplier controls the price; the purchaser controls the quantity. Suppliers are specialised in what they supply, purchasers are diversified in their purchases. This pattern has an important consequence: purchasers, who take the price of suppliers as given, extend their purchases up to the point where the marginal utility of the good (marginal utility of money taken as the numéraire of utility) equals its price (Gossen´s second law). There is no margin between marginal utility and price. Suppliers obtain a margin above marginal cost, because – even if they have to compete with other suppliers – they have some control over the price of the transaction. And in most cases they need this margin because their average cost per output exceeds their marginal cost.

15) For routine transactions this pattern is quite stable and universal, because it is associated with substantially lower transaction costs than any other feasible pattern of transactions. For example, if the purchaser first would have to haggle with the seller about the price of every little item she wants to buy, time spent on purchasing would be greater than it is today by an order of magnitude.

16) In terms of sales transactions wanted, as compared to transactions performed, purchasers are sales transaction saturated. Of any given category of goods they do not want to purchase more than they actually purchase, given their general economic circumstances, in particular, given their income, given their liquidity constraints (which credit cards ease) and given the prevailing prices in the economy. Because

they obtain a margin suppliers (merchants) normally make any additional sales they can. They are not sales transaction saturated. They are sales transaction hungry.

17) Suppliers in a particular product category compete for customers. But – given that suppliers are sales transaction hungry – purchasers do not really compete for suppliers: my decision to buy my chocolate bars at A does not prevent you from buying your chocolate bars at A. But my decision to buy my chocolate bars at A does prevent B from selling chocolate bars to me – for the time being. I select A over B. But A does not select me over you. A is prepared to serve you, whether or not I want to be served by A.

18) Obviously this short description of day-to-day transactions is not 100 % accurate. There are quantitative limits to the willingness and ability of the seller to sell his wares. And occasionally it occurs that the seller is out of stock is fully booked and can´t take additional orders. But a merchant who is frequently out of stock, will experience that purchasers turn away from him and he will not be able to survive the competition with merchants who arrange things in such a way as to be rarely out of stock. So the description I give is sufficiently accurate to be relied upon for our further discussion.

19) The prevalence of this asymmetric pattern of sales transaction saturated purchasers and sales transaction hungry sellers has implications for payment systems. A very old observation in economics is "Gresham´s Law": bad coin drives out good coin. Traditionally coins had a certain metallic value. If the metallic value of different exemplars of the same denomination differed the buyer who had to pay preferred to pay with a bad coin, i.e. a coin of lower metallic value. He was able to do this, because the seller, being sales transaction hungry, preferred to accept the bad coin to a failure to strike the deal. So bad coins had a much higher velocity of circulation and dominated the market place. This, of course, had long run implications for the purchasing power of money. To illustrate let us imagine a "Through-the-Looking-Glass" economy in which sellers are sales transaction saturated and purchasers are sales transaction hungry: here it would be the case that good coin would drive out bad coin. The buyer being sales transaction hungry prefers to pay with the good coin to a failure to strike the deal. This typically happens in a situation where the seller chooses between different customers as is the case in a queue for entering a night club: the

bouncer can afford to reject customers who do not fit the desired image of the club and select the most attractive ones instead. But this is clearly not a routine transaction.

20) The asymmetry also explains why it is mainly the purchaser who decides which payment system will be used in any particular routine transaction. The merchant is sales transaction hungry. The merchant therefore is interested in providing an image of taking care of the wishes of the purchaser. It is therefore the case that – within the scope of payment systems that he has elected to accept and the terms on which he has elected to accept them (which, as discussed in paragraphs 23 and 55 below, may include the imposition on the purchaser of a surcharge or the granting of a discount for payment by another means) he leaves the choice of the payment system to the customer.

21) The asymmetric pattern of transactions also explains the phenomenon which Alan S. Frankel calls "price coherence". [Confidential] The price is usually invariant against the means of payment. The cost which the use of a payment system in any particular instance implies may differ from one payment system to the next. Yet this cost differential is not generally reflected in different prices (except in certain sectors of the economy, e.g. travel and taxi services). The merchant is reluctant to turn away customers who have a preference for a particular payment system and therefore is disinclined to impose on the customer a surcharge.

22) “Price coherence” has its mirror image in the difficulty of credit card issuers to charge a transaction fee to cardholders. Not only merchants, but also credit card issuers experience that competition among suppliers allows purchasers to avoid transaction related fees. On this see below section D.

23) We must add that neither Gresham’s Law nor price coherence are independent of the cost differential of different payment systems. If this differential becomes too large merchants will impose a surcharge on the more expensive payment systems (or offer a discount for purchases made with a presumed less expensive means of payment like costs or otherwise attempt to influence their customer's choice of payment method). There is a range of tolerance for additional costs of payment systems. If the tolerance range is exceeded the merchant considers it more advantageous to impose a surcharge – even at the risk of loosing a few customers. (Similarly, Gresham’s Law does not

mean that the merchant will accept very bad coins. There is a certain tolerance range for coins of inferior quality).

24) Here we should note that the tolerance range for fees without surcharges probably has declined due to the universal presence of ATMs. If, nowadays the customer is confronted with a surcharge, at no great expense of time she has the possibility to obtain cash and thus to pay cash. Thus the risk that the customer will not buy the good because of the surcharge is substantially reduced. Rather, the customer will switch to cash. But then imposing a surcharge is less risky. A surcharge will be imposed at a lower cost differential than if ATMs were not available.

C Demand for Payment Systems, Credit Cards in Particular

25) We know from experience that different kinds of payment systems are used with different intensity across different types of transactions. Small item purchases tend to be cash payments, though many are made by cheque or card. Very large payments are more often, done by cheque or by bank transfer. Payments of an intermediate size are often done by debit or credit cards. Payments between persons who know each other well are done differently than payments from one stranger to another. The different kinds of payment systems have their advantages and disadvantages. The relative weight of different advantages and disadvantages depends on the specific circumstances of the transaction. It is not my intention to give a detailed description of the reasons why certain modes of payment are preferred here and other modes of payment are preferred there. What is important in the context of our report is the observation that the same person uses these different payment systems, choosing among them according to her convenience.

26) **[Confidential]**

Figure 1: 'Frequency distribution' of different payment cards

Figure 2: Choice of payment method in different shopping environments

27) Different payment systems are substitutes. A particular bill, like a hotel bill, could be paid in cash, by debit card, by credit card, or – perhaps – by billing and later bank transfer. If we order payments according to size (as in Figure 1) then we observe a

substantial overlap in the use of different payment systems. In a large number of cases – I believe a large majority of cases – the customer has the choice between different, competing payment systems.

28) But different payment systems also support each other. ATMs have made cash payment, for example away from home, more convenient than it was before. But, cash is obtained from ATMs by means of a credit card or a debit card. So the card, say, enables a safer and more convenient way of paying cash. ATMs may have the effect that cash holdings are lower than they would otherwise be. But, this only means that the opportunity cost of cash payments (in the form of interest foregone on cash holdings) has gone down and that persons who have a high propensity to pay cash benefit from the existence of large card systems which make a high density of ATMs commercially feasible.

29) I now turn to credit cards in particular. Credit cards of the modern kind combine certain conveniences of payment with the additional aspect or convenience of enhancing the purchasers liquidity. This latter property differentiates them from other cards like debit and charge cards (though charge cards offer a short term liquidity benefit). This feature makes it highly plausible that credit cards are a net benefit to the economy. In other words, the resources of the economy spent on running a payment system of the credit card kind are well spent: the benefit from this system is higher than its costs. Credit cards provide global access to ATMs, value of extended grace periods, access to credit at various levels of interest rates, etc. Apparently these attributes are considered by cardholders to be of value.

30) Yet it must be emphasised that credit cards compete with other payment systems. This is true at both the contractual framework level (level II) and at the transaction level (level I). For example, for any given purchase the typical purchaser has the choice between different modes of payment. Transactions fees of one payment system will induce substantially reduced use of the system, if a mode of payment with no transaction fee is available.

31) **[Confidential]**

Figure 3: Consumer switching from usage of credit cards to cash and debit cards in response to credit card transaction charges

[Confidential]

32) **[Confidential]**

D Implications of the Asymmetry for the Pricing of Competing Payment Systems

33) A payment system, which operates over a longer time, will have to be able to cover its costs from contributions of its users.

34) As I will show by the example of credit card systems (section H below), entry into the market for payment systems is not characterised by substantial barriers. We would expect that payment systems different from cash (which benefits from its legally protected privileged position) will not be excessively profitable since they must compete with cash and with each other. It is worthwhile to ask the question: what is the structure of the contributions covering the costs of a payment system under competitive pressure?

35) In each transaction the service provided by the four-party payment system used for the transaction is a joint product delivered to the purchaser and the merchant. As we know from elementary economics, the prices of two outputs which are jointly produced depend on the demand conditions for the two products. We therefore also here have to investigate the demand conditions. As we observed in section A, a payment system involves four quantities: two at the transaction level: H and M, where we know already that H=M. And two at the level II, the level of the contractual framework: H* and M*, the number of purchasers with access to the payment system, and the number of merchants accepting the payment system.

36) As we observed in section B the asymmetry implies that it is the purchaser who has the choice of payment system for any given transaction at level I demand (although, as discussed, merchants can influence this choice at the time of purchase). Thus, obtaining access to a particular payment system (i.e. exercising level II demand by joining the ranks of the H* cardholders), is equivalent to an option to use the payment system for any purchase from a merchant who accepts that payment system. The value of this option will depend on many things. In particular, it will depend on the alternatives open to the purchaser. The more payment systems are already usable by this purchaser the less important is the option of the payment system under consideration. A purchaser who already is the holder of a credit card will be less

inclined to pay a fee for another credit card than – other things equal – a purchaser who is not a holder of a credit card. The first credit card is more important than the second; the second credit card is more important than the third.

37) Let us assume a general price level for the annual fee to be paid by credit cardholders to credit card issuers. Assume that at this price level a particular person "A" only wants to hold one credit card. If there are several credit card issuers (either issuers of the same brand of credit card or of a different brand) competing for the custom of this person "A", and if they show about the same degree of acceptance among merchants, then the person is likely to sign up with the issuer, which offers the lowest annual fee. Proposition 1:We therefore expect substantial downward price pressure for annual fees of competing credit card issuers. **[Confidential]**

Figure 4: Response of credit card ownership to the introduction and increase of an annual fee (reference UK MasterCard product)

[Confidential]

38) Also, if person "A" has the choice between different credit cards then – other things equal – she will choose that card which offers the lowest volume based transaction fee for using the card with any purchase transaction. In particular, if there is a card which offers a zero transaction fee, it will – other things equal – be preferred by "A" over cards which imply a positive transaction fee. Proposition 2 (a): We therefore expect substantial downward price pressure for transaction value based fees for single cardholders. **[Confidential]**

Figure 5: Response of credit card ownership to the introduction or increase of a domestic transaction charge (reference UK MasterCard product)

[Confidential]

39) Moreover, if for any given purchase at any given merchant purchaser "B" (holding more than one credit card) has the choice paying with credit card X or credit card Y she will usually choose to pay with the credit card which charges her the lower transaction fee. Thus, the more expensive card will get used less. If, as is likely, acceptance among merchants is a function of the frequency with which a credit card is used by purchasers, then we arrive at Proposition 2 (b): There will be substantial downward price pressure for transaction value based fees for cardholders. Propositions 2 (a) and 2(b) are equivalent, but they are derived from two different causes, which have a cumulative effect. **[Confidential]**

Figure 6: Usage sensitivity to a [Confidential] transaction charge in selected purchase environments

[Confidential]

40) Let us now look at the impact of acceptance of payment systems by merchants on the choice of competing merchants by purchasers. If merchant M and N compete for the custom of purchaser A and if in this situation purchaser A has a preference to use payment system X rather than any other payment system, then – other things equal – we predict A to buy from M rather than N, if M accepts payment system X and N does not. From this follows Proposition 3: Other things equal, accepting a payment system will enhance the sales volume of a merchant.

41) Now, merchants are "sales transaction hungry". Getting the business of person A as a rule does not imply that merchant M will not serve person B also. Given all the other customers buying from M, the addition of the business of purchaser A is a net advantage for the merchant M, as long as the acquirer's value based fee for the payment system preferred by A does not eat up the margin which the merchant obtains from the sale to A.

42) We now enter into the calculus of acceptance of a payment system by a merchant. Assume a merchant M already accepts certain payment systems and he is confronted

with the question: should I now additionally accept payment system X? Some of the sales paid by payment system X will be incremental, i.e. this is revenue which he would not have obtained with the old payment systems. Another part of the sales paid by the payment system X will be revenue which would have been paid by the old payment systems, had he not accepted X. The profitability of accepting payment system X and thus the willingness to pay of merchants, will then be strongly influenced by the amount of incremental business generated by the acceptance of X. The profitability of accepting X will also depend (negatively) on the value based transaction fee to be paid to the owner of payment system X.

43) One should be aware that the acceptance decision of the merchant really is somewhat more complicated than simply the question whether to add a payment system X. The new payment system may have an impact on the profitability of the previously accepted payment systems. Thus, for example, if a new payment system X enters the market, it could well be that the new system makes an already accepted system Y less attractive because, for example, it carries a higher merchant fee than the new system, but is likely to be used by the same group of people as the new system. Then the merchant will replace Y by X, rather than simply add X.

44) The important point to note is that even a payment system X with a higher fee F than the fees of those which it partially replaces (f) will be accepted, if the incremental business is sufficiently substantial. We then can introduce Proposition 4: As long as a representative payment system is able to generate substantial incremental business for the merchant he is willing to accept the payment system for a transaction based merchant fee of a small percentage size.

45) If the fee is too large then merchants will start considering rejecting a given credit card and look to offer customers alternative card schemes that have a similar or equivalent value to customers. (These alternatives would include merchant-owned four-party credit card schemes as I discuss below in Section H). This ability leads to Proposition 5: The existence of alternative methods of payments and the scope for introducing alternative credit card schemes will put strong downward pressure on interchange fees from the merchant side.

46) Moreover, competition between issuers for the business of cardholders deters issuers from setting fall back interchange fees too high. **[Confidential]** I have also argued

above that merchants will be sensitive to increases in costs of these services. From this we can deduce that, if a four-party credit card system's interchange fee is too high (i.e. at a level greater than necessary to give the issuers an appropriate return on their respective capital investments), two things will happen: (a) the "excess profits" will be competed away to cardholders and (b) there will be some decline in the size of the system. This means that, in such a case, issuers' profits will be no more than is necessary to give them an appropriate return on their respective capital investments based on the volume of business that results from the excessive interchange fee level. Thus, we can conclude that, not only are issuers not advantaged by setting interchange fees too high, since any excess profits will be competed away, they will be left with fewer profits than they would have received had interchange fees been set at a proper, lower level. Hence, I believe that it is not necessary to scrutinise the level of a four-party credit card system's interchange fee, if as in the UK issuers face strong competition on the cardholder side of the business.

47) A payment system may even generate incremental business for the collective of all merchants. But the total incremental business generated by a payment system of high acceptance is smaller in percentage terms than the incremental business for the individual merchant. Even in the extreme case that it does not generate additional business with the collective of all merchants this is not an indication that it does not create value for the economy at large. It creates value for the purchasers. The fact that it creates incremental business for individual shops is simply a reflection of the preference of a substantial group of purchasers for the payment system over alternative payment systems. For this group of purchasers it obviously creates value.

48) This last point may be better understood if we look at an analogous situation: 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 now the law is rescinded again 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. Under competitive conditions we then expect most shops to increase their shopping hours again, thereby providing additional shopping convenience for customers. Yet total

shopping volume may not have changed at all. Nevertheless, in economic terms society benefits.

E Price Competition Between Payment Systems and the Structure of Price

49) I now turn to competition among payment systems. If an entrant into the market for payment systems wants to be successful it would have to incur initial losses. Obviously, a payment system with little acceptance among merchants has little chance of success among purchasers; and a payment system with little acceptance among purchasers has little chance of acceptance among merchants. Therefore the entrant will have to induce merchants to accept the card by guaranteeing, for example, a certain amount of business paid with this card, and at the same time might offer cardholders incentives to use the new card.

50) Under competitive conditions of entry we may expect that profitability of payment systems for their owners is limited. High profits of early entrants and of innovators will be competed away by later entrants and by imitators. Prices and costs converge, leaving little room for profits. The question arises: what is the pricing structure of payment systems in general under such conditions of normal profitability.

51) 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. Thus, 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 high frequency transactions. Among the credit cards in particular she will be attracted by those which 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. (See above propositions 1 and 2).

52) 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,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 (See propositions 3 and 4 above). 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.

53) 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: 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. This is likely to be the case in the UK where on average debit cardholders hold **[Confidential]** debit cards and credit cardholders hold **[Confidential]** credit cards (plus cash and frequently cheques).

54) We therefore expect a particular dynamics of price competition in this industry of payment systems. Prices paid by cardholders are competed down (propositions 1 and 2). This leads to an increase in the number of cards which 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.

55) 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 of the system by many merchants is to be avoided. The attractiveness of cards among cardholders is negatively affected by widespread surcharging (as shown in section D). Therefore the risk of increased surcharging after an increase of fees is one of the most powerful forces to keep merchant fees low. We would expect that actual surcharging is rather infrequent because payment systems have a great interest to avoid merchant surcharging of their system. But nevertheless, merchants' right to surcharge imposes substantial downward pressure on merchant

fees. The same analysis would apply with respect to discounts for preferred forms of payment like cash.

56) Let me also emphasise 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 may turn out to be counterproductive.

57) As discussed in section H below, if profits in the payment system industry were supernormal we would expect entry of new payment systems. Such entry raises the choice of merchants and thereby drives down merchant fees. This goes on until normal profitability has been obtained.

F Fallback Interchange Fees as a Requirement for Four-Party Credit Card Systems

58) In section D we derived from the asymmetry property of routine transactions that a large part of the revenue of a competitive credit card system will come from merchants. As we observed already at the outset, 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 into 1. the set of those activities of the operator which create costs for the service to the purchaser and into 2. the set of those activities which create a service to the merchant.

59) 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 of 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.

60) 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.

61) 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 a large part of 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 by each bank involved is closely related to the costs borne by those banks. Indeed, as I showed in section D 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.

62) As it happens, the activities of the cardholder's bank tend to cause a higher cost burden 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. The issuing bank also has larger administrative and processing costs than the acquiring bank: the turnover effected by a credit card system spreads over nearly million cardholder customers (in the UK) and only over a number of merchants which is in the order of 100 times lower.

63) So it turns out that a four-party 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 the merchants.

64) One might imagine that such reimbursements can be agreed upon by a network of bilateral agreements between all the banks involved. But it is not difficult to see why such set-up could not work. Indeed, assume that, by government intervention, the mutual fallback interchange fee is rescinded and any pre-existing agreements about bilateral reimbursement rates are annulled. So now banks have to find new bilateral agreements replacing the interchange fee. Let MIF be the rate of the fallback interchange fee which so far was used. 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.

65) Will we find an issuing bank which 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 a lower income from the interchange fee.

66) In fact merchants are likely to pay more under conditions in which interchange fees are set "bilaterally" (i.e., without reference to any fall back 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 MIF and later on for example, the multilateral interchange fees 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 their 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 by higher than the appropriate fee level.

67) 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 set forth in paragraph 66 above would likely lead to the system's average interchange fee increasing, and to the costs to the merchant for accepting the system's cards increasing relative to the cost of accepting other payment products. 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 (see section G below).

68) So a mutual understanding about the level of the reimbursement of issuing banks has to be achieved in order to protect acquiring banks and merchants from unduly high interchange compensation and merchant fees. The arrangement of member banks in relation to a fallback interchange fee protects merchants against unduly high merchant fees.

69) 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. If issuing banks´ transaction prices charged from the acquiring banks would rise and rise and rise, eventually more and more merchants will leave the system and will no longer accept the card. The payment system becomes uncompetitive and will be replaced by others, for example those organised by the merchants themselves.

70) Even if we assume that without a 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.

71) 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?

72) [Confidential]

73) 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.

G Three-party Credit Card Systems as the Replacement for Four-Party Credit Card Systems

74) Consider the likely result of a prohibition of interchange fees for four-party credit card systems. If there is strong demand for credit card payment systems then we would not expect credit cards to disappear. We would expect four-party credit card systems to disappear, as the prohibited interchange fee was shown to be indispensable for them. But then three-party credit card systems would take their place. Three-party systems also get a large part of their revenue from merchants rather than from their cardholders. But, obviously, they are not vulnerable to the prohibition of interchange fees.

75) There is no particular reason to expect that three-party credit card systems can work more efficiently than four-party systems.

76) If three-party credit card systems have costs not lower than four-party credit card systems organised by banks then we expect one of two things as a consequence of a prohibition of mutually agreed interchange fees of four-party systems: either three-

party systems prevail and merchant fees for credit cards are likely to be higher than before. Or credit cards disappear altogether.

77) The latter is the less likely outcome. Credit cards, which combine a payment convenience with a liquidity convenience seem to be sufficiently useful for cardholders such that they are unlikely to disappear. This is consistent with the fact that four-party credit card systems evolved out of three-party credit card products offered by banks.

78) We should also note that there is of course more competition in the market for payment systems if four-party systems are in it than if they are replaced by three-party systems. Acquiring banks compete within the system for the custom of merchants, as issuing banks compete for cardholders. Such internal competition is absent in the three-party system which replaces the four-party system due to the fact that it does not have an interchange fees problem. If anything, other things (in particular efficiency) are equal, we expect lower prices from four-party systems than from three-party systems.

79) We conclude that the likely result of the prohibition of interchange fees is the replacement of four-party credit card systems by three-party credit card systems. Three-party credit card systems are likely to be more expensive than four-party credit card systems.

80) **[Confidential]**

Figure 7: Recovered revenue and numbers of cards (MasterCard and Visa base case with MIF, and replacement with MIF and entrance of three-party system)

[Confidential]

81) **[Confidential]**

H Entry by Merchants

82) It is sometimes argued that there are barriers to entry into the market for payment systems or a "market" for credit cards. The reasons given are network effects: an established payment system benefits from acceptance on both sides the purchasers and the merchants which build on each other: only a card widely accepted by merchants is

of interest for purchasers, and only a card with at least some acceptance by cardholders is of interest for merchants.

83) But, as I have already pointed out in section D, entry can be obtained if the entrant is prepared to invest in initial losses: the entrant will have to induce merchants to accept the card and at the same time offering cardholders incentives based on the value of purchases paid for by the new card. But initial losses are the normal case with entry into any market. They cannot be considered a barrier to entry. Any kind of business relies on established customer relations. An entrant will always have to invest into acquiring established customer relations. There is no fundamental difference in the case of payment systems. The only difference is that customer relations to one group of customers depends on customer relations with the other group of customers. But this is a characteristic of any kind of market for intermediation services. For example, a real estate agent can only hope to obtain custom among people who want to buy a house if he or she has custom among people who want to sell a house: and vice versa. I am not aware of a theory in economics which would say that any kind of market for intermediation services is by this very fact of intermediation characterised by barriers to entry.

84) It is important to understand that one source of entry can be customers. Obviously this is an unlikely source of entry if there are millions and millions of small customers. But it is a very likely source of entry if customers are large and well organised organisations. This is the case with the merchant customers of payment systems. Large retail chains already issue credit cards to their customers. These store cards are well established. **[Confidential]**

85) Without too many problems large retail chains, large hotel chains, large travel businesses can get together to create their own four-party credit card system. **[Confidential]** For this group of large merchants it is even easier to enter the business: their costs of acquiring customers is lower than for other entrants. They themselves are the merchant customers of the new four-party credit card system. And their customers as purchasers are a natural base to obtain cardholders. **[Confidential]**

86) The new credit card of large merchants would likely have similar cost structures to those of existing credit card systems. Also, like banks, they would have a large

customer base to which to market their cards. Of course, the merchant fee of their card would have to be large enough to cover the costs of card system.

87) If it really were the case that merchant fees within four-party credit card systems were excessive one would except to have seen successful entry into the credit card business by one or more groups of large merchants.

I Cash Customers Are Not Harmed by the Fallback Interchange Fees of Four-Party Credit Card Systems

88) [Confidential]

89) I have shown above that prohibition of an interchange fee would lead to the replacement of four-party credit card systems by three-party systems which are not likely to be more efficient and therefore cheaper (section F). I have also shown that the competitive process implies that a large part of the revenue of a credit card system will be obtained by value based merchants´ fees (section D). Therefore prohibition of the interchange fee would raise rather than lower merchants´ fees for credit card payment systems. If anything, cash payers will be burdened more by the abandoning of the interchange fee, to the extent that the fee is indispensable for the running of four-party systems. If it is correct that, due to "price coherence", the costs of payment systems are essentially borne by all purchasers in proportion to their purchases then cash payers would not prefer three-party credit card systems to four-party credit card systems, because merchants can be expected to pay at least as high merchant fees as those paid to four-party credit card systems.

90) Moreover, cash payers today to a very large degree obtain cash from ATMs. By the same argument as in section E we can show that the use of ATMs will become more expensive without an interchange fee, unless the ATM is owned by the bank with the account from which the customer draws her cash. In other words, cooperation of banks to obtain an efficient worldwide ATM system requires joint agreements including fallback interchange fees. Otherwise ATM customers pay more than is necessary.

J Conclusions

91) I can now conclude my analysis of the economics of credit cards.

92) In my view credit cards contribute a number of features that are highly desirable for consumers as well as merchants for the purpose of undertaking routine transactions at the retail level. Credit cards are a liquidity enhancing and convenient method of payment which offer benefits to the economy and society as a whole.

93) My analysis of pricing of competing payment systems leaves me in no doubt that credit card systems are subject to competition from other payments systems and methods of payment as well as competitive pressures among individual credit card issuers and acquirers. This is for several reasons:

- First, there is evidence of significant substitutability of payment systems and methods of payment at the point of sale where purchasers have a wide choice of alternative means of payments and where merchants are generally willing for their customers to make the choice of method of payment. The survey evidence that I have reviewed suggests a very high sensitivity of cardholders to a price increase at the point of sale. I also observe that substitutability of credit cards is equally strong with respect to debit cards and cash. This leads me to conclude that credit cards compete in a wider market [Confidential] .

- Second, my analysis leads me to conclude that there are significant downward price pressures on cardholder fees of competing credit card issuers, whether they are transaction value-based fees, interest rates or annual fees.

- Third, as long as credit cards are able to generate substantial incremental business for the merchant he is willing to accept a card for a transaction value-based fee of a small percentage.

- Fourth, decisions taken by purchasers and merchants about the number of competing payments systems are interdependent. The downward pressure on cardholder fees will tend to increase the number of cards held by purchasers. The more cards a purchaser holds the less the pressure on the merchant to accept any particular system's cards.

- Fifth, price competition among payment systems is enhanced by the fact that surcharging (and other means available to merchants to influence purchasers' means of payment decisions at the point of sale) is possible in the UK. From the point of view of payment systems, surcharging etc. by many merchants is to be avoided given the high sensitivity of cardholders to transaction value-based fees.

- Sixth, if merchants perceive the fees payable by them for accepting credit cards to be too high they are able to take a number of measures that include the option to set up their own credit card schemes. These can be three-party as well as four-party schemes. Merchants are in a particularly advantageous position to enter the market for payment systems given that they represent the customer base of all schemes.

94) Seventh, my analysis of competition among payment systems and between issuers and acquirers leads me to conclude further that the determination of a fallback interchange fee is a basic requirement of a four-party credit card scheme that has to operate under competitive pressure from three-party systems and other means of payments. The fact that specific costs of the joint credit card service are located in one part of the system (mainly issuers) does not mean that the revenues have to be allocated in exactly the same way. On the contrary, on the basis of my analysis I expect that merchants will carry a large part of the costs of the payment systems and means of payment that they accept.

95) Eighth, there are very good reasons as to why the interchange fee should be determined as a fall back interchange fee by the members of a credit card scheme and not through bilateral agreements. Bilateral interchange fees would work, in my view, to the detriment of merchants and would be likely to end up at higher levels than multilateral interchange fees. Nor is it correct [Confidential] to characeterise the fall back interchange fee as a price-fixing agreement. The MIF does not fix the prices of a credit card systems as a whole. It merely shifts costs. Price competition at the acquiring as well as issuing side serves to keep prices to merchants and cardholders in check.

96) Ninth, a prohibition of fall back interchange fees of four-party payment systems would likely lead to their being replaced by three-party systems. Since this would result in the elimination of internal system competition, and as there is no reason to believe that three-party systems are more efficient than four-party systems, I believe this would lead to higher prices for payment services.

97) Finally, because the prohibition of interchange fees would likely lead to higher prices for payment services, and assuming “price coherence” exists, cash paying customers would be worse off if default interchange fees were prohibited.